



**Poudre Canyon Fire Protection District**

**Community Wildfire Protection Plan**



Cover photo: Cameron Peak Fire 2020 by Paula Collins



## **2023 Community Wildfire Protection Plan**

Prepared by Poudre Canyon Fire Protection District  
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**Cameron Peak 2020**



# **POUDRE CANYON**

## **FIRE PROTECTION DISTRICT**

# 1. Introduction

## 1.a. Purpose and Need for a Community Wildfire Protection Plan

Community Wildfire Protection Plans (CWPP) help communities assess local hazards and identify strategic investments to mitigate risk and promote preparedness. Assessments and discussions during the planning process can assist fire protection districts with fire operations in the event of a wildfire and help residents prioritize mitigation actions. These plans also assist with funding gaps for fuel mitigation projects since many grants require an approved CWPP.

The 2023 CWPP for the Poudre Canyon Fire Protection District (PCFPD) is an update to the CWPPs developed in 2007-2008. Complex interactions among wildland fuels, weather, and topography determine how wildfires behave and spread. Many aspects of wildfires are predictable based on known scientific research on the physical processes driving fire. Much of the work in this CWPP is based on scientific research and computer models of wildfire behavior. This document is a tool for PCFPD, land managers, residents, communities, and homeowners to begin prioritizing projects that make PCFPD a safer and more resilient community. The objectives of this project are to:

- Produce an actionable CWPP based on analyses of fuel hazards, burn probability, and community values across the fire district.
- Prioritized recommendations for reducing fire hazards, and hardening homes.
- Engage community members during the CWPP process to address local needs and concerns.

### Why is the CWPP relevant to me?

Becoming a fire adapted community that can safely coexist with wildland fire takes a concerted, ongoing effort by everyone who lives, owns property, protects, or manages land in and around the Poudre Canyon. Conditions in PCFPD share some risk factors common to past catastrophic wildfires across the country. This CWPP provides recommendations for how to prepare your family to safely evacuate during a wildfire, how to mitigate your home ignition zone to give your house a fighting chance at surviving wildfires and protect the lives of firefighters engaged in protecting your community.

## 1.b. Partners and Stakeholder Engagement

Collaboration is an important part of CWPPs. Community engagement, partner commitment, and follow through are what make a CWPP successful. The Core Team engaged stakeholders from across the district and neighboring districts to develop the recommendations in this CWPP. They brought lessons learned from the High Park Fire in 2012 and Cameron Peak Fire in 2020 and considered community and stakeholder values and input.

Core Team is made up of:

Max Erickson, Supervisory Forester, Fort Collins Field Office, Colorado State Forest Service

Derek Rosenquist, Sergeant, Larimer County Sheriff's Office Emergency Services Unit

Hugh Collins, Chief, Poudre Canyon Fire Protection District

Bette Blinde, Assistant Chief, Poudre Canyon Fire Protection District

Gretchen Reuning, Larimer Conservation District





Matt Marshall, Larimer Conservation District  
Daniel Bowker, Forest & Fire Program Manager, Coalition for the Poudre River  
Watershed

Others participating in this plan include:

Upper Poudre Canyon Association  
Lower Poudre Canyon Association  
Volunteer Members of the Poudre Canyon Fire Protection District  
Drala Mountain Center  
Ben Delatour Scout Ranch  
United States Forest Service (USFS)

Numerous meetings occurred in the development of this plan. Meetings started in September 2022 and they continue to be held. In addition to the meetings, residents were asked to give input via survey that was emailed to them and put in the district newsletter. Firefighter volunteers were asked for input on the CWPP and survey. A webinar was held for people to ask questions and is available for review on the district's website. There was also a stakeholder's meeting to provide feedback on areas they were working on and additional areas in the district that need mitigation. Community members were able to provide feedback in three community meetings that were held in February. Questions community members were asked include:

- What are the top three things that are going well in your community as they relate to wildfire risk and preparedness?
- What are your community's top three wildfire-related risks?
- What are three opportunities for improvement in the community?
- What are the top three barriers to achieving these improvements?
- Circle three priority areas on the map that should be mitigated to help protect the community.

The district has also put a webform on the district's website where residents can add additional areas in need of mitigation.

### Why is the CWPP relevant to me?

Work you do to reduce fire risk on your property can amplify the work that your neighbors do on theirs, resulting in greater protection for everyone. Removing trees from along roadways can increase the visibility of your property to firefighters, increase the accessibility of your property for fire engines, and reduce the chance that non-survivable conditions can develop and entrap residents and first responders during wildfires.



Community meeting at Station 4 was also presented on Zoom for people to attend remotely.



Community meeting in Lower Canyon.



Community meeting at Station 2.

### 1.c. Accomplishments since previous CWPP

The Poudre Canyon Fire Protection District developed their first CWPPs for each of the population areas of the district in 2007 and 2008. These CWPPs identified two main areas that needed improvement. They identified that the district needed better fire fighting equipment and that they needed better fire houses to store the new engines. In 2008 the PCFPD asked residents to increase the mil levy so they could build new fire stations and obtain better equipment. New stations were completed in Poudre Park and Rustic in 2012, just in time for the High Park Fire. A new station was completed in the Manhattan Creek area in 2020, just in time for the Cameron Peak Fire. In addition the district acquired new Type 6 engines for all four stations.

Other activities the department implemented were to help residents burn slash piles in the winter, and purchase heavy duty chippers for residents to remove slash.

Old Station 1



New Station 1



Old Station 2

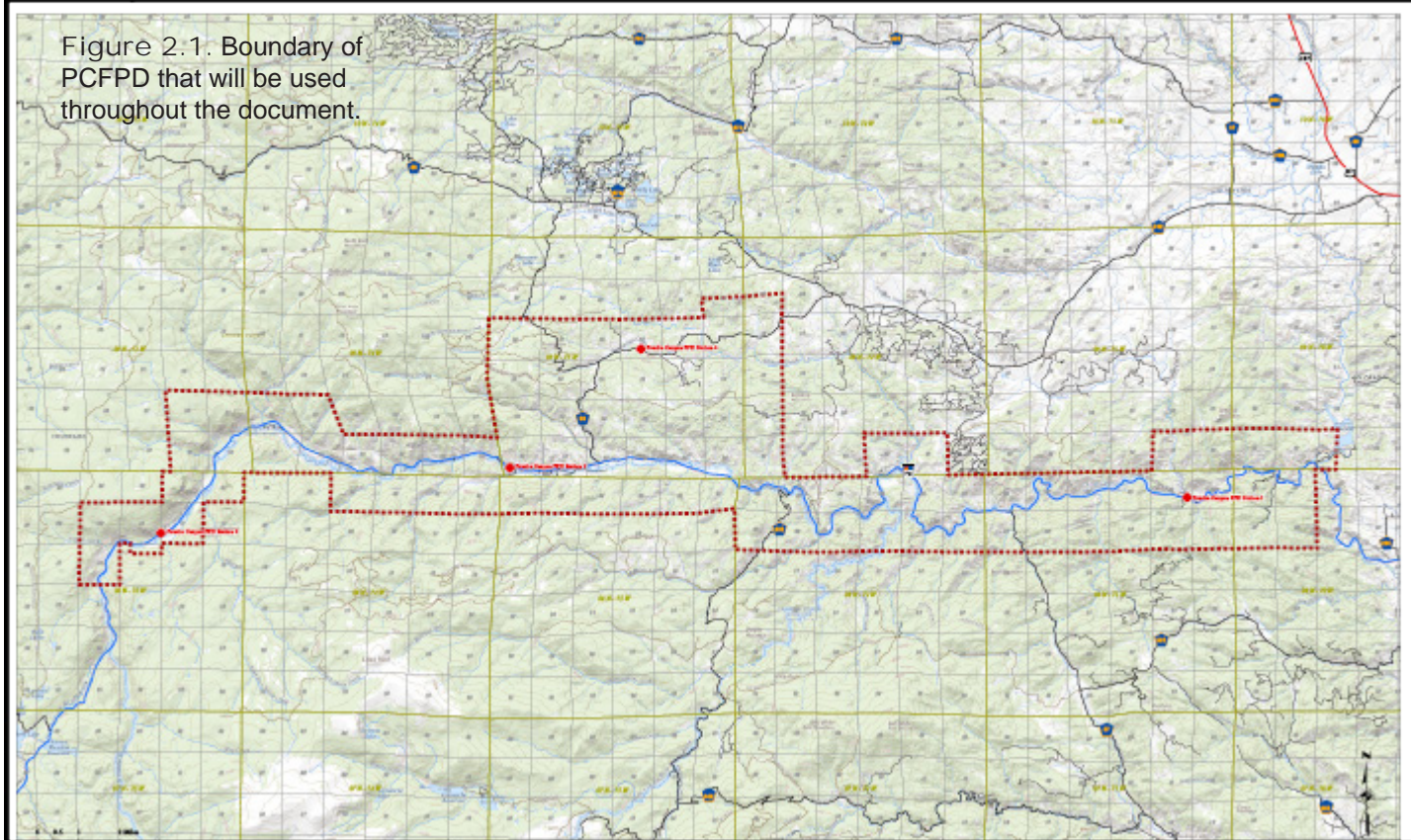


New Station 2





Figure 2.1. Boundary of PCFPD that will be used throughout the document.



## 2. Poudre Canyon Fire Protection District (PCFPD): Background

### 2.a. General Description

Poudre Canyon Fire Protection District (PCFPD) covers the area from MM 117 to MM 76 along Colorado State Highway 14, also known as Poudre Canyon Road, CR 69 and CR 68C. It covers 91 square miles and is home to 750 year-round residents and another 750 part-time residents (snowbirds or weekenders). The Wildland Urban Interface (WUI) community areas in the district are Poudre Park, Rustic, Spencer Heights and Manhattan Creek.

Adjacent landowners:

- US Forest Service
- Ben Delator Scout Ranch
- Glacier View
- Rist Canyon

Poudre Canyon Fire Protection District is an all-volunteer fire department that operates out of four fire stations in a rural, mountainous area in northern Colorado. With 35 volunteers, PCFPD responds to 911 calls for fire, flood, traffic accidents, swift water rescue, and injuries/illness. PCFPD also provides mutual aid to six surrounding fire departments (Crystal Lakes, Red Feather Lakes, Glacier View, Livermore, Poudre Fire Authority and Rist Canyon) and works with the US Forest Service and Larimer County Sheriff's Office of Emergency Services, providing services as needed. In 2020 when the Cameron Peak Fire started in August, PCFPD had already responded to seven other fires. It was a dry year.

PCFPD is in the wildland-urban interface (WUI) area of the Canyon Lakes Ranger District of the Arapaho Roosevelt National Forest. This WUI includes private, state and federal lands. The district encompasses 91 square miles. PCFPD is also the first responding

agency to another 150 square miles located south and west of the district that has no emergency services. Last year, over 12% of our calls provided service to this unserved area. The district contains eight National Forest campgrounds and 12 National Forest day use areas and trailheads and hundreds of non-designated trails and campsites. There are an additional 11 camp grounds and trailheads that are accessed through our district. Being located adjacent to the front range, visitors come from Denver, Boulder, Fort Collins, Greeley and other Front Range communities to hike, bike, camp, fish, rock climb, raft, kayak, ATV, horseback ride, hunt, ski, snowshoe, snowmobile and more. In 2010 it was estimated that 800,000 people visited our area. That number is now over 1 million visitors.

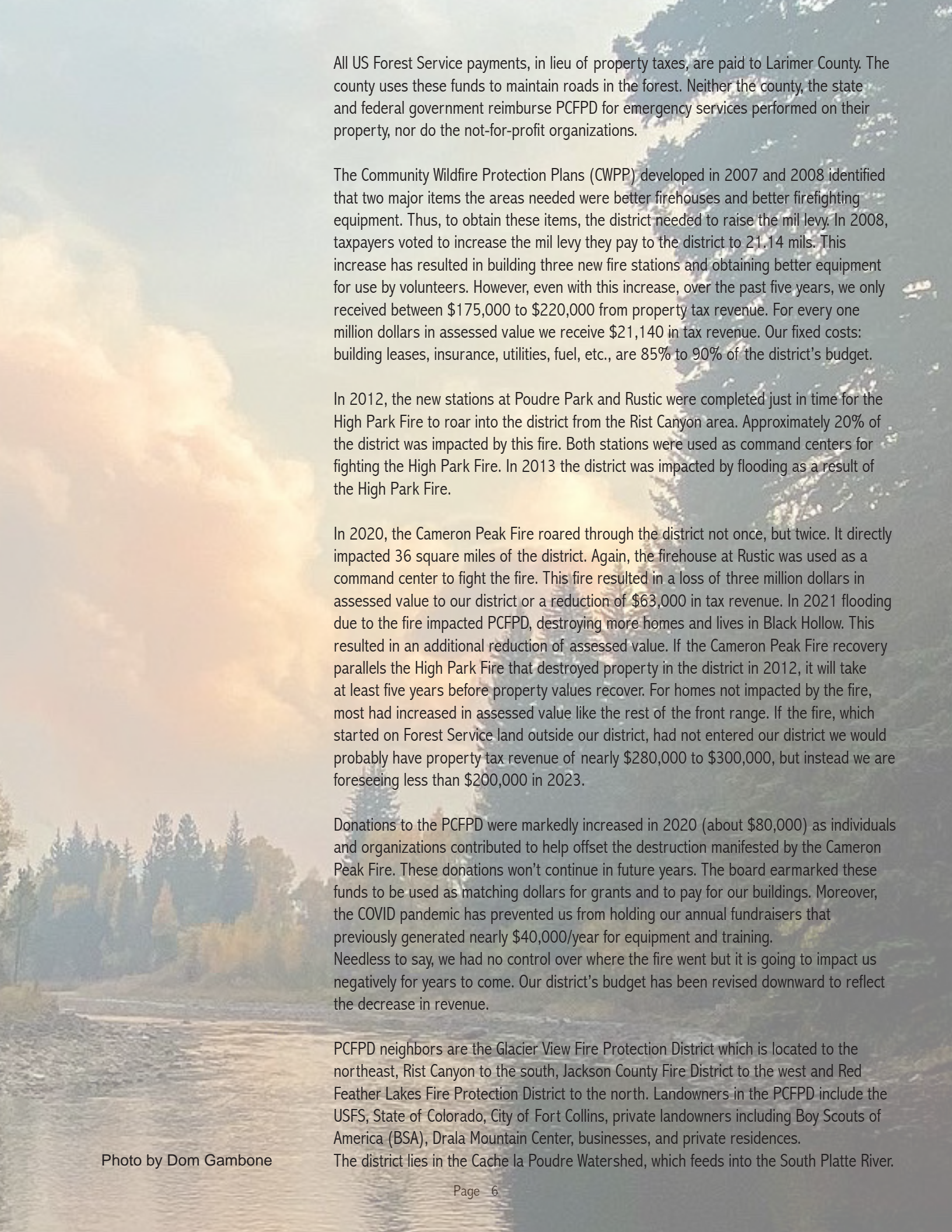
Colorado State Highway 14 traverses the district from east to west. Highway 14 parallels the winding Cache la Poudre River that has created Poudre Canyon. It is a paved road that provides access from the Front Range to Cameron Pass on the Continental Divide. The district is mountainous. Its elevation on the eastern side of the district is 5400 feet. It is all uphill from there to over 9000 feet in altitude. With the exception of Highway 14, roads within the district are gravel roads maintained by Larimer County, dirt roads maintained by private landowners and unmaintained four-wheel-drive dirt roads. The steep mountain sides in the Poudre Canyon means mechanical thinning of trees is impossible in most areas.

The lower altitudes have sage and rabbit brush with some deciduous trees (mainly cottonwood and ash). As you travel west and the elevation increases it changes to aspen, ponderosa pine, fir, juniper and spruce tree forests.

The four fire stations are each located in areas of the district with the greatest population density. Station 1, located in the community of Poudre Park is within commuting distance to Fort Collins. The main demographic is younger people with families. It is an area that experiences recreational visits during the summer with rafting companies bringing a steady stream of people to raft the Poudre River. There are trailheads for hikers and horseback riders. There are fishing, picnicking and camping opportunities. Twenty-three miles west is Station 2, located in the community of Rustic. This area experiences a marked population increase during the summer months. Station 2 area residents are mostly retirees that include year-round and summer-only or weekend property owners. Eleven miles further up is Station 3. It is the furthest west fire station and has similar demographics as Station 2 but fewer residents. Station 4 is on the north side of the district. It is in an area of mostly year-round residents, with two not-for-profit organizations that own substantial acreage. Both the Drala Mountain Center and the Ben Delatour Scout Ranch provide educational opportunities for their visitors. These two organizations draw people from across the county and around the world. Permanent residents in this area are mostly retired or self-employed.

Poudre Canyon Fire Protection District's main source of revenue is property taxes. The secondary source of funding is donations from fundraising activities. Geographically PCFPD is a large district encompassing 91 square miles. However, there are only 650 tax-paying properties in the district, most of whom are cabin and small-home property owners. There are fewer than 10 commercial properties in the district. Non-tax paying property owners include the US Forest Service (which owns approximately 80 percent of property located within the district boundaries), the State of Colorado, Larimer County, the City of Fort Collins, and two not-for-profit organizations.





All US Forest Service payments, in lieu of property taxes, are paid to Larimer County. The county uses these funds to maintain roads in the forest. Neither the county, the state and federal government reimburse PCFPD for emergency services performed on their property, nor do the not-for-profit organizations.

The Community Wildfire Protection Plans (CWPP) developed in 2007 and 2008 identified that two major items the areas needed were better firehouses and better firefighting equipment. Thus, to obtain these items, the district needed to raise the mil levy. In 2008, taxpayers voted to increase the mil levy they pay to the district to 21.14 mils. This increase has resulted in building three new fire stations and obtaining better equipment for use by volunteers. However, even with this increase, over the past five years, we only received between \$175,000 to \$220,000 from property tax revenue. For every one million dollars in assessed value we receive \$21,140 in tax revenue. Our fixed costs: building leases, insurance, utilities, fuel, etc., are 85% to 90% of the district's budget.

In 2012, the new stations at Poudre Park and Rustic were completed just in time for the High Park Fire to roar into the district from the Rist Canyon area. Approximately 20% of the district was impacted by this fire. Both stations were used as command centers for fighting the High Park Fire. In 2013 the district was impacted by flooding as a result of the High Park Fire.

In 2020, the Cameron Peak Fire roared through the district not once, but twice. It directly impacted 36 square miles of the district. Again, the firehouse at Rustic was used as a command center to fight the fire. This fire resulted in a loss of three million dollars in assessed value to our district or a reduction of \$63,000 in tax revenue. In 2021 flooding due to the fire impacted PCFPD, destroying more homes and lives in Black Hollow. This resulted in an additional reduction of assessed value. If the Cameron Peak Fire recovery parallels the High Park Fire that destroyed property in the district in 2012, it will take at least five years before property values recover. For homes not impacted by the fire, most had increased in assessed value like the rest of the front range. If the fire, which started on Forest Service land outside our district, had not entered our district we would probably have property tax revenue of nearly \$280,000 to \$300,000, but instead we are foreseeing less than \$200,000 in 2023.

Donations to the PCFPD were markedly increased in 2020 (about \$80,000) as individuals and organizations contributed to help offset the destruction manifested by the Cameron Peak Fire. These donations won't continue in future years. The board earmarked these funds to be used as matching dollars for grants and to pay for our buildings. Moreover, the COVID pandemic has prevented us from holding our annual fundraisers that previously generated nearly \$40,000/year for equipment and training. Needless to say, we had no control over where the fire went but it is going to impact us negatively for years to come. Our district's budget has been revised downward to reflect the decrease in revenue.

PCFPD neighbors are the Glacier View Fire Protection District which is located to the northeast, Rist Canyon to the south, Jackson County Fire District to the west and Red Feather Lakes Fire Protection District to the north. Landowners in the PCFPD include the USFS, State of Colorado, City of Fort Collins, private landowners including Boy Scouts of America (BSA), Drala Mountain Center, businesses, and private residences. The district lies in the Cache la Poudre Watershed, which feeds into the South Platte River.



Most of the land is montane shrubland and ponderosa pine woodland, interspersed with mixed conifer stands and montane grasslands. Black bear, mountain lion, moose, elk, bighorn sheep and mule deer are some of the large wildlife found in the PCFPD.

Fuel loads, a way to interpret vegetation as a source for wildfire, vary across the district, with light to moderate loads on the eastern side of the district and patchy, light to moderate fuel loads found on the western side. The area burned by the High Park Fire in 2012 and Cameron Peak Fire in 2020 have lighter fuel loads now. Some areas have widely spaced trees with few ladder fuels; these areas would most likely experience surface fires with occasional passive tree torching. Other areas are densely forested on steep north-facing slopes or canyons and could experience active crown fires that would be difficult if not impossible for firefighters to contain. Grassy areas across the PCFPD could experience fast-moving surface fires. Homes serve as an additional source of fuel that could produce high-intensity flames, emit embers, and initiate home-to-home ignitions.

Non-residential values at risk within PCFPD include

- four fire stations
- two electrical substations
- various small and large capacity transmission lines
- Drala Mountain Center and the Great Stupa
- Ben Delatour Scout Ranch
- State Highway Department
- State Fish hatchery
- Businesses: restaurants and resorts

There are four population areas in the district with each area having a fire station. Those areas are Poudre Park with Station 1, Rustic with Station 2, Spencer Heights with Station 3, and Manhattan Creek with Station 4. These population areas are all within the wildland-urban interface. They are described in the next few pages.

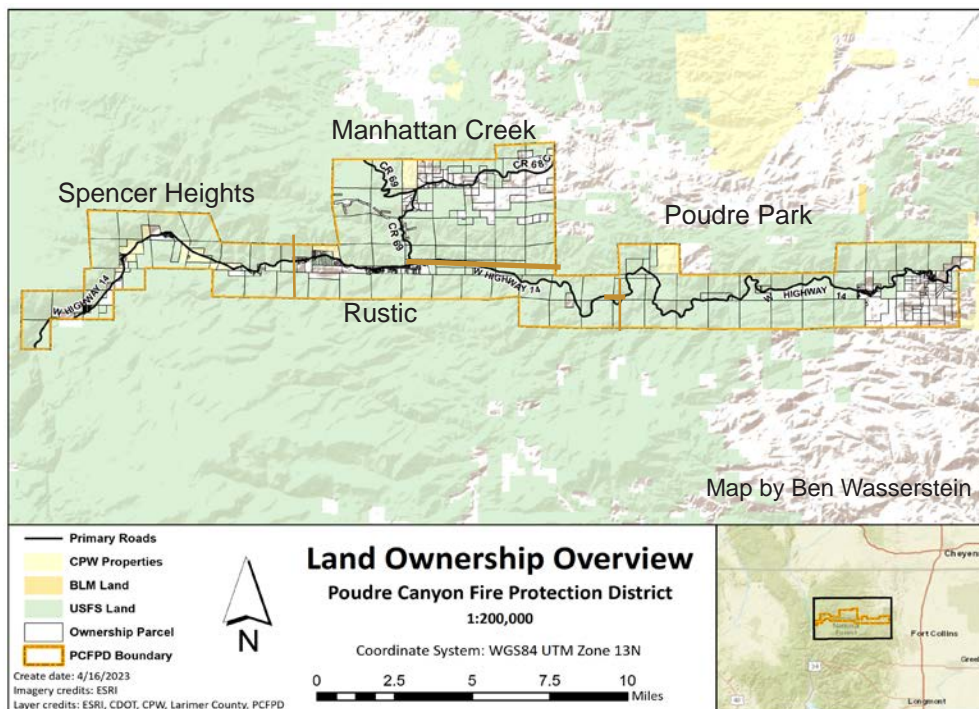
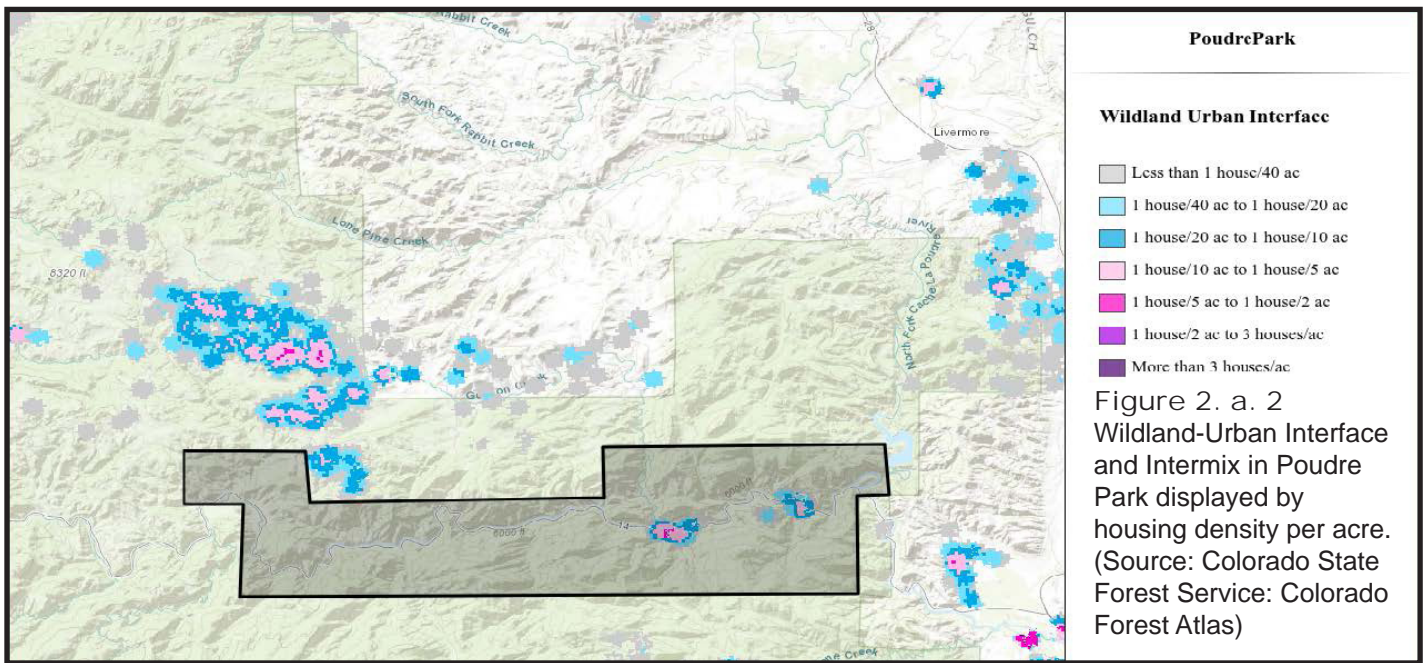


Figure 2.a.1 Displays the boundary area of the PCFPD and the four treatment areas of the district. It also shows land ownership.



## Poudre Park

The community borders are defined as:

- East Border is MM 117
- West Border is MM 100
- South Border - 1 mile from Hwy 14 on CR 23

Legal:

Township 9 North, Range 72 West of the 6th PM Sections 34, 35

Township 8 North, Range 72 West of the 6th PM Sections 1, 2, 11, 12

Township 8 North, Range 71 West of the 6th PM Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

Township 9 North, Range 71 West of the 6th PM Sections 35, 36

Township 9 North, Range 70 West of the 6th PM Sections 31, 32, and the west half of section 33

Township 8 North, Range 70 West of the 6th PM Sections 5, 6, 7, 8

FYI  
Mile Marker (MM) numbers  
decrease from east to west.

The Poudre Park community is defined by the natural breaks between inhabited areas and extends from Gateway Natural Area in the east to Century Park day use area in the west. This section of Highway 14 is a major destination for campers, hikers, rafters, fishermen, and sightseers. Even though there are many miles that have few structures, such as from the Stove Prairie Road to Century Park, this is a high use area. Popular hiking trails include Grey Rock, Hewlett Gulch, and Young Gulch. The Cache La Poudre River is a favored destination spot for whitewater rafting, kayaking, picnicking, and fishing. Many residences and businesses are accessed directly off Highway 14, also known as Poudre Canyon Road. However, there are some side roads off the highway.

From the east, the PCFPD and the Poudre Park area starts just east of Gateway Park located at approximately mile marker (MM) 117. Immediately west of North Poudre Diversion Dam MM 115.5 is a steep driveway that serves three homes. There is room to turn a type 6 around up there. Kings Canyon Road near MM 115 is a very narrow and rough road. There are seven residences up this road now, down from the 11 pre-High Park Fire. There are a few places to turn a type 6 engine around on this road. There is no access to water. Smith Bridge at MM 114.9 is wood construction with no official weight rating but has supported type 6 engines. There are 12 residences across the bridge. At MM 114.5 there is a drive with 1 residence at the end. There is no place to turn around, but a type 6 could back up this driveway. The entrance to Unger Mountain Road MM 114.6 could easily be mistaken for a driveway. It is on the south side of road just east of Manners Bridge. There are nine residences up this road, with the last being 1.1 miles uphill. There is limited turn around and no water access. Manners Lane Bridge MM 114.5 is concrete and steel beam construction with no official weight rating. There are seven residences across this bridge. The Workman Bridge is of wood construction and is posted at a seven ton weight limit. This bridge serves one residence and is difficult to pass over. Greyrock Trail at MM 113.4 is a popular hiking trail. There seems to be a fire up there almost every summer. There is a foot bridge crossing the river at the trailhead. The west end of the Meadow Trail has a steep and unmarked, but usable access to the Hewlett Gulch Trail. As you enter Poudre Park (from the east) there are three bridges in a row, Kramer, Wrobbel and Elder. These bridges are from MM 112.4 to 112.2. Kramer Bridge MM 112.4 is of concrete, wood and steel construction and has no official weight



rating. This bridge is not right on Hwy 14. It provides access to three properties on the far side of the river. The Wrobbel Bridge is concrete, wood and steel construction with no official weight rating. Although there is no weight rating, it is not recommended to take fire equipment across this bridge. In an emergency you could access this area via the Kramer Bridge. Elder Bridge, mile marker 112.2, is of concrete, wood and steel construction with no official weight rating. It is not recommended to drive an engine across it and the area is accessible via the Kramer Bridge.

Between approximately mile markers 112.5 to 111 is the community of Poudre Park. This community has approximately 100 residences, the vast majority are lived in year-round. Poudre Park also has Fire Station #1, a community center, a church and a small mobile home park with a campground and a small general store. The majority of the residences and the non-residential properties just mentioned are all along Highway 14 with the notable exceptions:

From East to West:

- Ray Shoaf Ln. (north)- four residences
- Wonderful Pl. (south)- three residences
- Poudre River Rd. (east, horseshoe from 14 back to 14)- 27 residences
- Driveway directly across from east end of Poudre River Rd serves two properties
- Falls Creek Dr. (south)- 17 residences
- Hewlett Gulch Bridge (concrete and steel beam, can support emergency apparatus)  
- serves Hewlett Rd. and Wild River Rd.- six residences, Hewlett Gulch Trail and Hewlett Gulch Landing Zone

The Poudre Park Picnic Area (approx MM 110.6) is the end of the residential area in the Lower Canyon until you reach the Mishawaka Inn at MM 108.1 (13714 W. Hwy 14). Improved camp and picnic sites, from east to west, that are located between MM 110.6 and MM 108.1 include::

- Poudre Park Picnic Area, MM 110.6
- Diamond Rock Picnic Area, MM 110.2
- Ouzel Picnic Area, MM 109.7
- Ansel Watrous Campground, East (MM109) and West (MM 109.1) (open year round)
- Young Gulch Trailhead, MM 109

The Mishawaka Inn is open year-round. This property has at least two year-round residents on the property. Immediately west of the “Mish” is the last residential property, MM 108 (13965 W. Hwy 14) before the Narrows, the official end of the Lower Canyon.

West of the “Mish” is Stove Prairie Road that runs to the south, with access to Rist Canyon Fire Protection District around MM 105.8. Poudre Canyon District extends one mile south of Highway 14. West of Stove Prairie Road are the following improvements on the north side of Highway 14 along the river:

- Stove Prairie Landing Campground MM 105.4
- Upper Landing Picnic Area MM 105
- Stevens Gulch Day Use Area MM 104.7
- Big Narrows Bridge (spanning the river) MM 104.1

On south side of Highway 14:

- Lower Narrows Campground MM 101.9
- Narrows Campground MM 101.7
- Dutch George Campground MM 100.6
- Century Park Day Use Area MM 100.2

The Narrows is a popular rock climbing area.

At MM 103.8 there is a walk suspension bridge that services one house on the other side of the river. There is no way to get fire equipment, other than on foot, across the river at this point.

The Narrows are from MM 105-102. The south aspect has heavy enough vegetation to support a significant fire and was only partially burned during the High Park Fire. The north aspect is mostly steep rock walls. There are a few areas at MM 101, 99, and 98 that are popular but illegal campsites. These are of great concern for unapproved campfires.

## Community Access

The main access through the Poudre Park Community is via Highway 14, which runs east/west through the full length of the community. Highway 14 is a state highway maintained by the Colorado Department of Transportation (CDOT). Highway 14 is accessed from Jackson County to the west, the intersection of US Highway 287 to the east, and can also be accessed from Pingree Park Road (MM 96) or Stove Prairie Road (MM 106) west of Poudre Park.

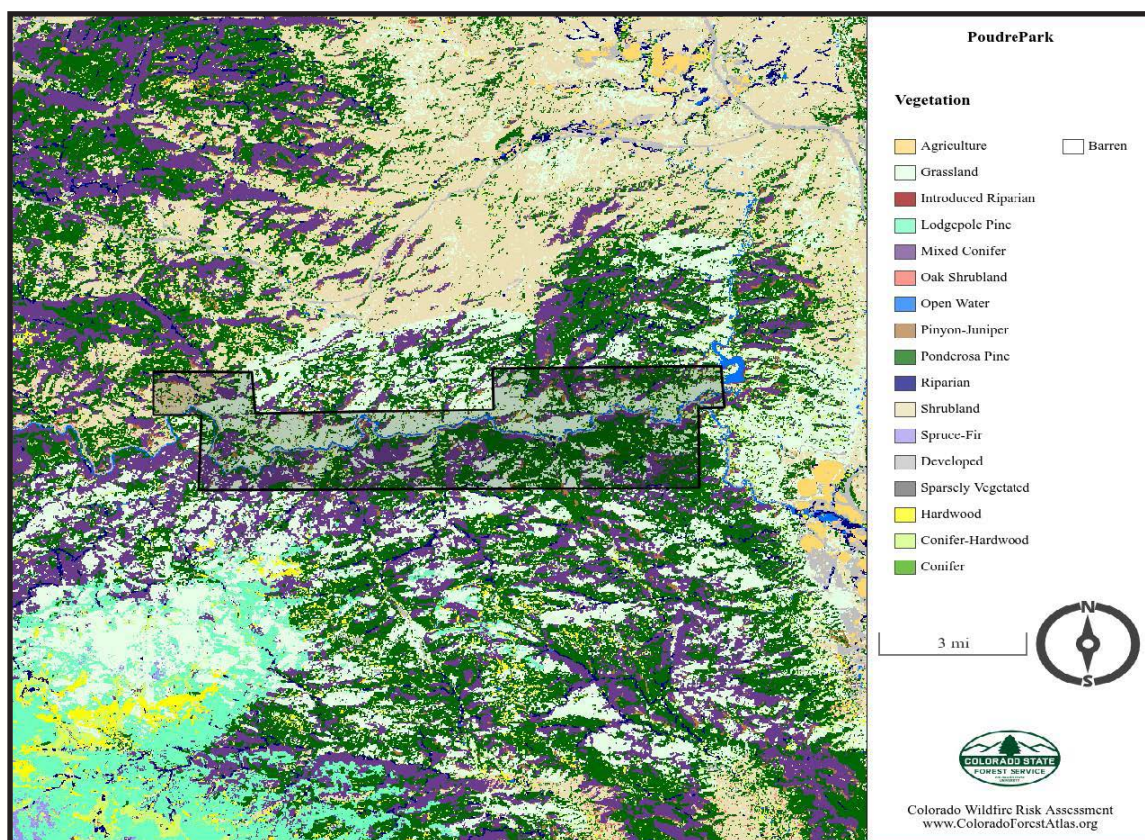


Figure 2.a.3. Map of vegetation across Poudre Park. Most of the land is ponderosa pine woodland, interspersed with mixed conifer stands and montane grasslands. (Source: Colorado State Forest Service, Colorado Forest Atlas).

## Vegetation Type

The elevation in the Poudre Park area ranges between 5,400 and 7,000 feet. This elevation is known as the Lower Montane and consists mostly of ponderosa pine. Interspersed amongst the pine are fire-flashy Rocky Mountain Juniper trees. Other trees in the area consist of Blue Spruce, Engelmann Spruce, and aspen. The river's edge is predominately populated with cottonwood and willow. At this elevation there is still a fair amount of highly combustible sagebrush, chokecherry, and currant bushes. Vegetation varies between the north and south facing slopes. The south aspect is predominantly sagebrush and grasses. The north aspect consists of a much denser tree population,

most of which is ponderosa pine. Tall prairie grasses grow along most of the roadways. During dry seasons of the year, this material would ignite quickly, carrying wildfire throughout the community.

### **Businesses in Poudre Park the Lower Canyon**

- Columbine General Store and Rusty Buffalo Campground - being remodeled
- Poudre Christian Fellowship Church
- Poudre Canyon Fire Protection District - Fire Station #1
- Lower Poudre Canyon Community Center
- Mishawka Amphitheatre

### **167 Homes exist in the WUI**

- Kings Canyon
- Smith Bridge
- Manners Lane
- Poudre Park
- Hewlett Gulch
- Boyd Gulch
- Unger Mountain
- Falls Gulch
- And many houses along highway 14

PCFPD's Station 1 in Poudre Park

### **Trailheads in Poudre Park**

- Grey Rock Trailhead
- Hewett Gulch Trailhead
- Young Gulch Trailhead

### **Evacuation Routes**

- Highway 14 east to US 287
- Highway 14 west to CR 69 (no trailers over 16 feet) or Cameron Pass
- CR 23 (Stove Prairie Rd.) south to Rist Canyon or US 34



To see the entire [Colorado Wildfire Risk Assessment \(COWRA\) report for Poudre Park, click HERE.](#)



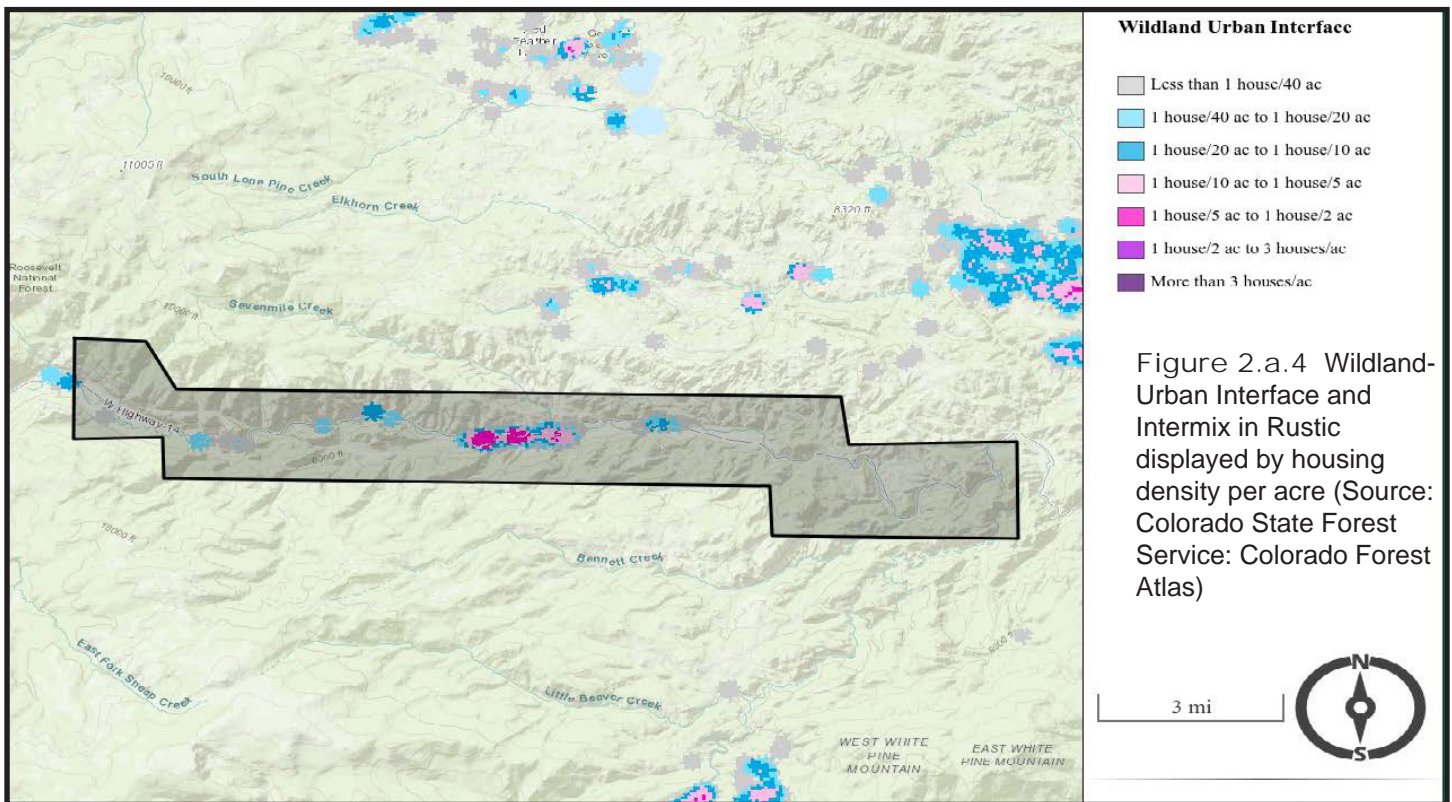


Figure 2.a.4 Wildland-Urban Interface and Intermix in Rustic displayed by housing density per acre (Source: Colorado State Forest Service: Colorado Forest Atlas)

## Rustic:

The Rustic community is defined by the natural breaks between inhabited areas. The community borders are defined as:

- East Border — MM 100 Century Park
- West Border — MM 83 Big Bend
- North - MM 1 CR 69
- South - MM 2 CR 63E

### Legal

Township 9 North, Range 74 West of the 6th PM Sections 29, 32, 33, 34, 35, 36

Township 8 North, Range 74 West of the 6th PM Sections 1, 2, 3, 4

Township 9 North, Range 73 West of the 6th PM Sections 31, 32, 33, 34, 35, 36

Township 8 North, Range 73 West of the 6th PM Sections 1, 2, 3, 4, 5, 6

Township 8 North, Range 72 West of the 6th PM Sections 3, 4, 5, 6, 7, 8, 9, 10

Colorado State Highway 14 runs east and west through the center of the Rustic WUI. Highway 14 is the main escape route for the Rustic area. The Cache La Poudre River runs east and west through the Rustic WUI, parallel with Colorado State Highway 14. The Cache La Poudre River is designated a Wild and Scenic River and also provides domestic and agricultural water for a large area of northern Colorado. The Cache La Poudre River is a significant financial asset as it draws visitors interested in camping, fishing, hunting, and water sports. All of the businesses in the Rustic area and up and down the river depend on tourist dollars. The Cache La Poudre River also provides some of the finest fishing in the entire state of Colorado. Near the community of Rustic, wild trout waters are managed with special regulations so that fly and lure enthusiasts have the opportunity to fish for wild trout.

## Community Access

The main access through the Rustic Community is via Highway 14, which runs east/west through the full length of the community. Highway 14 is a state highway maintained by the Colorado Department of Transportation (CDOT). Highway 14 is accessed from Jackson County to the west, the intersection of 287 to the east, and can also be accessed from Pingree Park Road (MM 96) or Stove Prairie Road (MM 106) east of Rustic, or County Road 69, which intersects Highway 14 near the Rustic Resort (site), mile marker 91. Many residences and businesses are accessed directly off Highway 14, also known as Poudre Canyon Road. Rustic Road, Crown Point Dr., U Bar U Lane, and Norman Fry Road are all accessed by bridges to the south of Highway 14 over the Cache La Poudre River.

Near MM 98 there is a bridge that accesses USFS cabins. There is a locked gate at the bridge, but if it is open the bridge is rated for 9 tons.

Near MM 95.9 is County Road 63E, which accesses the Pingree Park area. The bridge should handle any type emergency equipment. There are four structures across the bridge, which are within the district. Even though the PCFPD is called to support many

emergencies in the Pingree Park area it is not within the district and is not part of the CWPP. There is one residence at the junction of Highway 14 and CR 63E at MM 95.3.

- County Road 69 -- Can be used as an evacuation route. There are three residences within a quarter mile of the junction of CR 69 and Hwy 14.
- Rustic Road – This road is accessed via a wooden bridge with four steel beams. The bridge is safe to handle legal highway loads. The road is narrow and over grown in many places, but does have a few areas sufficient for a turn around. In emergencies, the gate between Crown Point Dr. and Rustic Rd. can be opened for an alternate exit.
- Crown Point Dr. and U Bar U Lane – To access these roads you need to cross a concrete bridge. The bridge is safe to handle all legal highway loads. Crown Point Drive has good access, egress, and places to turn around. U Bar U Lane is a narrow road with overgrown vegetation and should not be use. It requires extensive mitigation. Instead access it through Samples Meadow (55 Crown Point Dr.) and use hose lays. In emergencies, the gate between Crown Point Dr. and Rustic Rd. can be opened for an alternate exit.
- Meadow Lane and Riverside Drive, “Poudre City”, is accessed from Highway 14 directly. No bridge crossing is required. These two roads form a loop, which allows easy access and egress.
- Norman Fry Road– Is accessible via a Bridge near MM 89. The bridge has a locked gate with a fire department lock. The wooden bridge with steel beams can support 90,000 pounds and fire equipment. Norman Fry area has sufficient area to turn around.
- Profile Rock Bridge - was removed after the Black Hollow Flood in 2021. There are eight houses with foot traffic access across the river.
- Black Hollow Bridge - easy access and area to turn around.
- Idylwilde at MM 86.9 is an area on the North side of Hwy 14. The road loops around providing adequate access and egress for rural fire engines.
- Home Moraine RV Park (currently closed). There is a bridge that leads into the back of the property N 40\* 41.731, W 105\* 41.440. There are no structures beyond the bridge.
- River Ridge Lane MM 85.3 is on the south side of Hwy 14. There are three houses
- There is a bridge just west of the Fish Hatchery that is access for two cabins. The bridge should carry type 6 engines and there is room to turn around. N 40\* 42.188, W 105\* 43.150.

Prescribed fire done by Forest Service in 2019 to improve habitat for bighorn sheep. Photo by Hugh Collins.





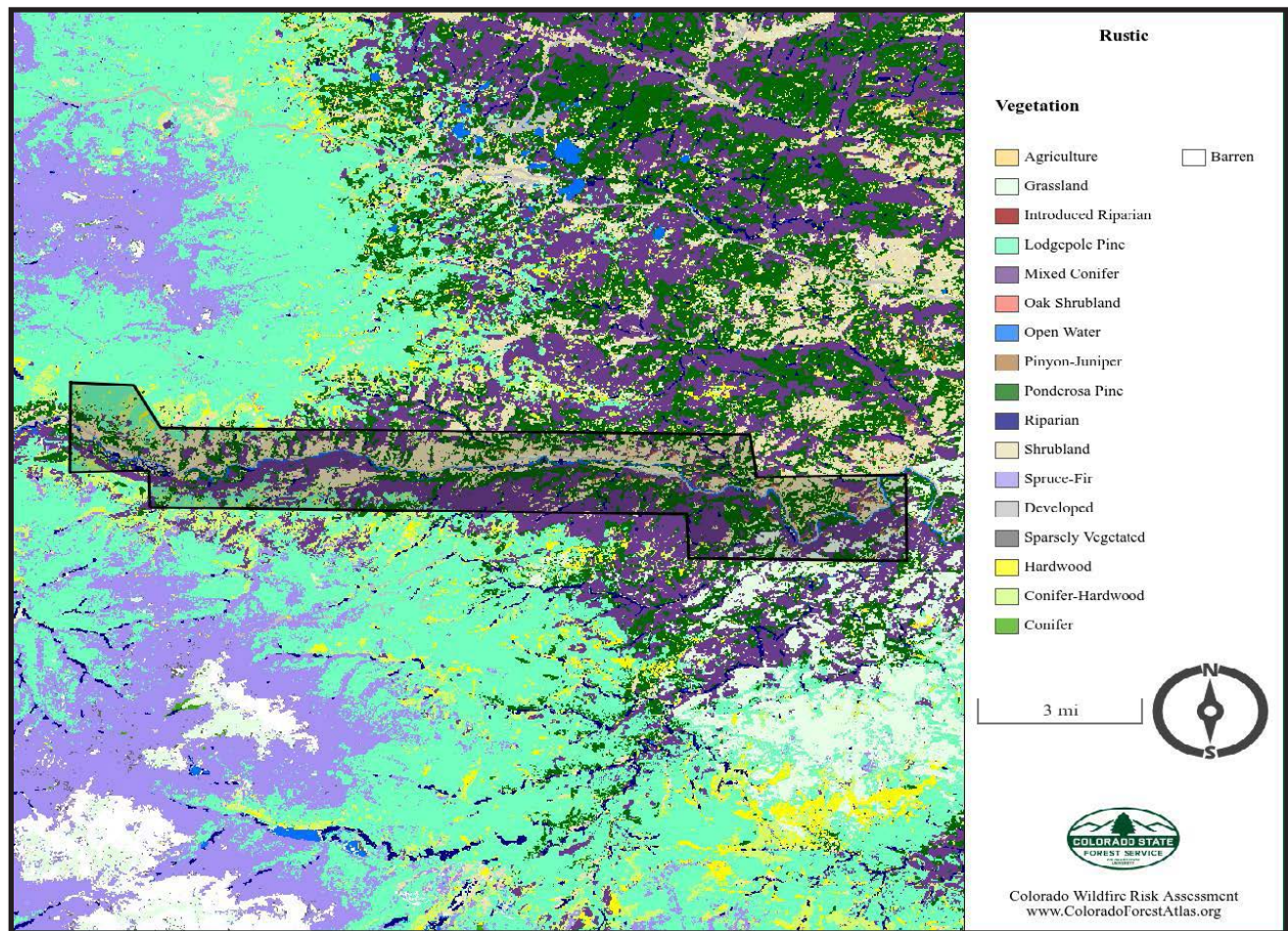


Figure 2.a.5 Vegetation in the Rustic treatment area is mostly mixed conifers, ponderosa pine and shrubland. (Source: Colorado State Forest Service: Colorado Forest Atlas)

## Vegetation Type

The elevation in the Rustic area ranges between 7,000 and 7,700 feet. This elevation is known as the Lower Montane and consists mostly of ponderosa pine. Interspersed amongst the pine are fire-flashy Rocky Mountain juniper trees. Other trees in the area consist of blue spruce, Engelmann spruce, fir, and aspen. The river's edge is predominately populated with cottonwood and willows, with interspersed dogwood. At this elevation there is still a fair amount of highly combustible sagebrush, chokecherry, and currant bushes.

Vegetation varies between the North and South facing slopes. The south aspect is predominantly sagebrush and grasses. The north aspect consists of a much denser tree population, characterized by mixed conifer with valley bottoms dominated by ponderosa pine. Tall prairie grasses reside along most of the roadways. During dry seasons of the year, this material will ignite quickly, carrying wildfire throughout the community.

## Businesses in Rustic

9 Businesses exist in the WUI

- Rustic Cabins
- Glen Echo Resort
- Bighorn Cabins
- Canyon Utilities
- Beck's R/C Adventures
- Poudre River Resort
- Canyonside Campground



- Poudre Canyon - Station 2
- Poudre Canyon Chapel

Other structures at risk:

- There is an electrical substation in the Seven Mile Creek area that is essential to the electrical power supply in the Rustic area. It is off of CR 69 and on FS Road 225. N 40\*42 .320, W 105\*35.267
- Historic Arrowhead Lodge, Visitor Center, USFS
- Home Moraine RV Park (Closed in 2020)
- State Fish Hatchery, Colorado State
- There are a total of 195 houses in Rustic area.

## Trailheads in Rustic

- Mountain Park Campground - MM 98.5 - hiking
- Kelly Flats Campground (Lower) MM 97 - jeep
- Dadd's Gulch - MM 93 - Hiking
- Seven Mile - North on County Road 69 to Forest Road 225 — jeep

## Evacuation Routes

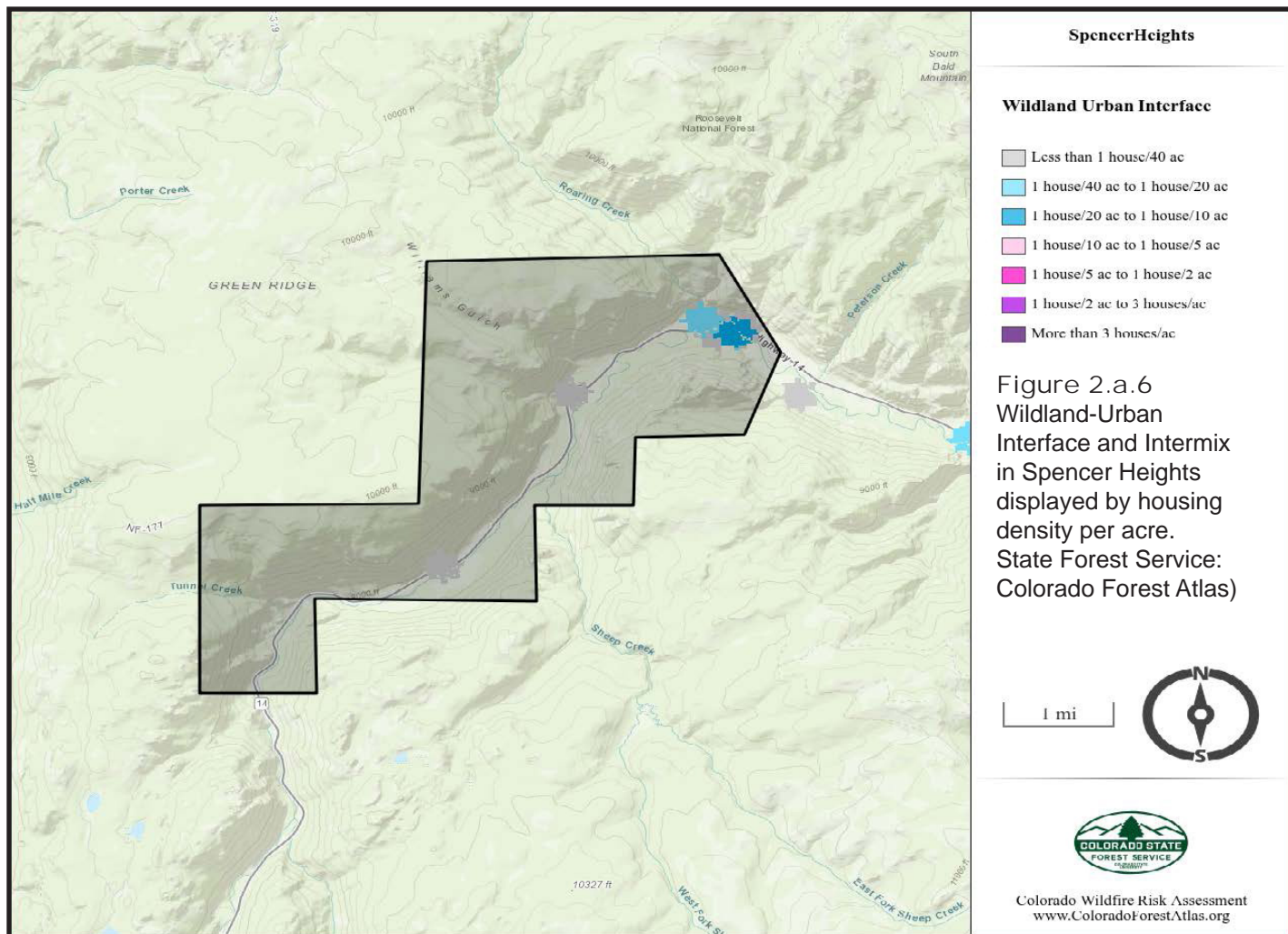
- Highway 14 east
- Highway 14 west
- CR 69 (no trailers over 16 feet)
- CR 63E (Pennock Pass closed in winter)

FYI  
In addition to fire trucks and ambulance, there is an industrial chipper that is available for residents to mitigate their property

To see the entire [Colorado Wildfire Risk Assessment for Rustic, click here.](#)

PCFPD's Station 2 in Rustic.





## Spencer Heights

The Spencer Heights community is defined by the natural breaks between inhabited areas and encompasses the area west of the fish hatchery. The community borders are defined as:

- East Border – MM 84 Big Bend
- West Border – MM 76
- North & South borders are generally defined as the first visible ridge on either side of Hwy. 14.

### Legal

Township 8 North, range 75 West of the 6th PM  
Sections 1, 2, 9, 10, 11, 16  
Township 9 North, Range 75 West of the 6th PM  
Sections 25, 26, 35, 36  
Township 9 North, Range 74 West of the 6th PM  
Sections 30, 31

The Spencer Heights community is defined by the natural breaks between inhabited areas and encompasses the area west of the fish hatchery. Colorado State Highway 14 runs through the center of the Spencer Heights WUI. Highway 14 is the escape route for the Spencer Heights area.

The Cache La Poudre River runs through the Spencer Heights WUI, parallel with Colorado State Highway 14. The Cache La Poudre River is designated a Wild & Scenic River and also provides domestic and agricultural water for a large area of northern Colorado. The Cache La Poudre River is a significant financial asset as it draws visitors interested in camping, fishing, hiking, riding, hunting, rafting and other summer sports. In winter, skiing and snow shoeing are popular. The businesses in the Spencer Heights area and down river depend on tourist dollars. The west edge of the WUI is Cameron Pass, which, butts up to the Colorado State Forest and Jackson County. Cameron Pass (el. 10,276 ft.) is a mountain pass between the south end of the Medicine Bow Mountains and the north end of the Never Summer Mountains. It sits on the border between Jackson County and Larimer County, approximately 3 mi (5 km) north of the boundary of Rocky Mountain National Park. The pass is located within Roosevelt National Forest and Colorado State Forest. The pass receives much snow during the winter months and is prone to avalanches, but it usually remains open all-year round. The pass is drained on the north side by Joe Wright Creek, a tributary of the Cache la Poudre River in the basin of the South Platte River. It is drained on the south side by the Michigan River, a tributary of the North Platte River in North Park.



## Community Access

Access through the Spencer Heights Community is via Highway 14, which runs east/west through the full length of the community. Highway 14 is a state highway maintained by the Colorado Department of Transportation (CDOT). Highway 14 is accessed from Jackson County to the west, the intersection of 287 to the east, and can also be accessed from Pingree Park road (MM 96), Stove Prairie Road (MM 106), or County Road 69, which intersects Highway 14 at Rustic, mile marker 91: all are east of Spencer Height's area. Majority of residences and businesses are accessed directly off Highway 14, also known as Poudre Canyon Highway.

Below are descriptions for bridges and access to community areas.

- Shetland is accessed at MM 82, with a narrow entrance and a bridge. N 40° 42.740, W 105° 44.238. The bridge is constructed with two steel beams and will support type 6 engines. The bridge is access to 16 properties. Towards the end of the road there is adequate turn around space for most rural fire engines.
- Across from the Trading Post at MM 78.4, there is Jacoby Bridge which does not access any residences. N 40° 40.529, W 105° 46.852
- At MM 77.3 there is cable trolly across the river that serves one house.

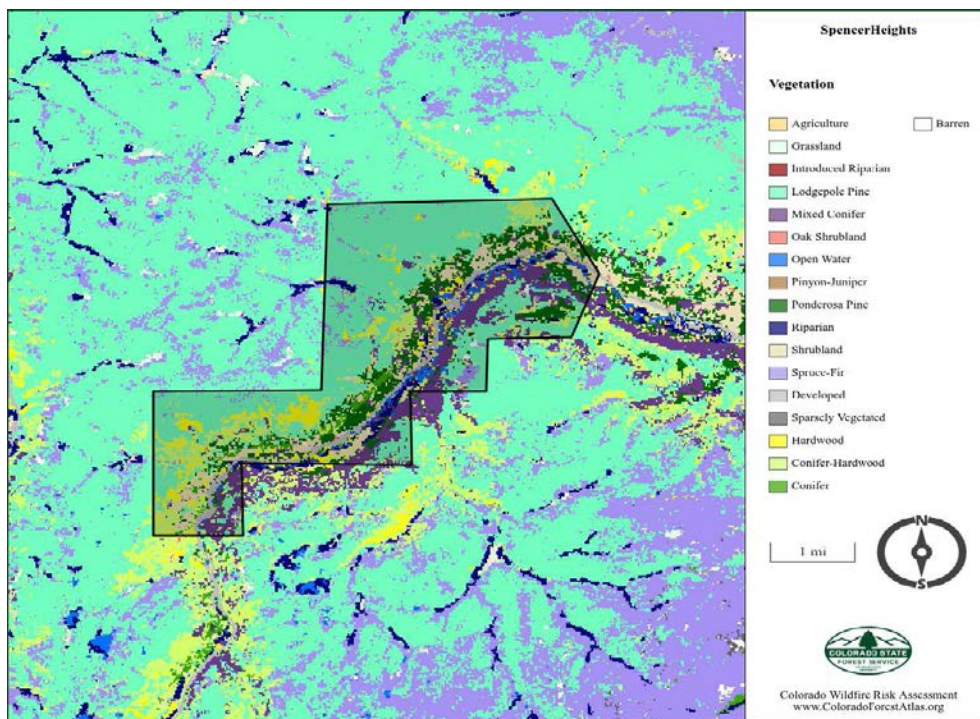


Figure 2.a.7 Vegetation in Spencer Heights treatment area is lodgepole pine, with some ponderosa pine and mixed conifer. (Source: Colorado State Forest Service: Colorado Forest Atlas)

## Vegetation Type

The elevation in the Spencer Heights WUI ranges between 7,200 and 8,300 feet. This elevation consists mostly of ponderosa pine in the lower elevations and lodgepole pines in the higher elevations. Interspersed amongst the pine are fire-flashy Rocky Mountain juniper trees. Other trees in the area consist of blue spruce, Engelmann spruce, fir, and aspen. The river's edge is predominately populated with cottonwood and willows. At this elevation there is still a fair amount of highly combustible sagebrush, chokecherry, and currant bushes. On the east end of the WUI, vegetation varies between the north and south-facing slopes. The south aspect is predominantly sagebrush and grasses. The north aspect consists of a much denser tree population, most of which is ponderosa or lodgepole pine. Tall prairie grasses reside along most of the roadways. During dry seasons of the year, this material would ignite quickly, carrying wildfire throughout the community. As the elevation rises and



the Poudre River turns South near MM 74, the vegetation is more consistent on both sides of Highway 14. The forest is much denser with a mixture of lodgepole pine and Engelmann spruce being the dominate tree species along with some subalpine fir.

### **Businesses in area:**

- Trading Post
- Sportsman's Lodge

### **Homes**

- Shetland/Sheridan Street - MM 82
- Williams Gulch - MM 80.5
- Houses along highway 14

There are six residences on Big Bend Road, seven residences accessed from Highway 14 between MM 82.7 and MM 81, four residences in Shady Rest Lane, and 16 residences from MM 81 to Sleeping Elephant Mountain or MM 79.

### **Trailheads in area:**

- Roaring Creek Trailhead – hiking
- Boston Peak – hiking

### **Evacuation Routes**

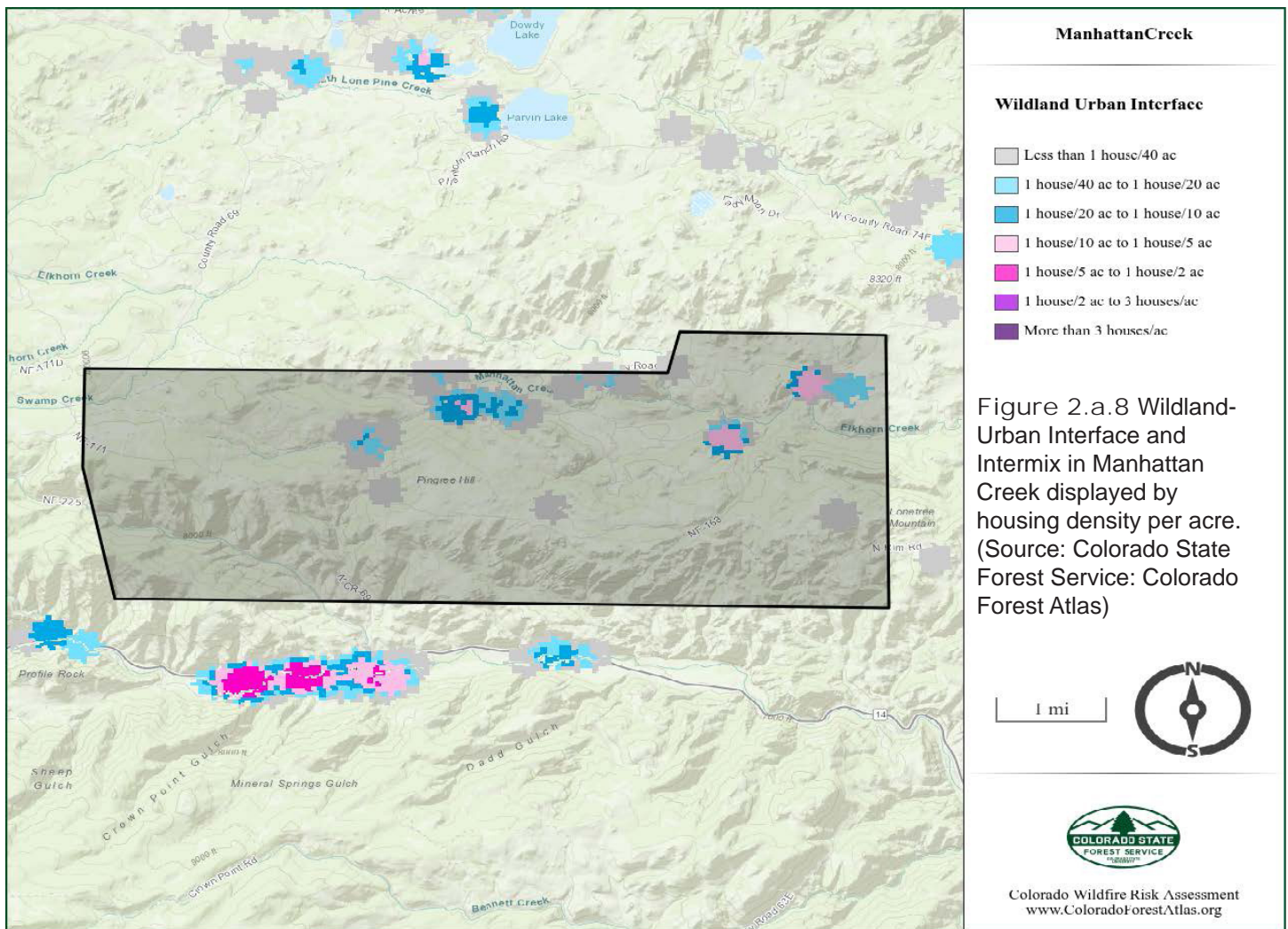
Highway 14 East

Highway 14 west

To see the entire [Colorado Wildfire Risk Assessment for Spencer Heights, click here.](#)

PCFPD's Station 3 in Spencer Heights.





## Community Access

The Manhattan Creek Community is situated along both sides of County Road (CR) 68C and a portion of CR 69. CR 68C intersects with CR74E in the north east and CR 69 in the west. CR 69 intersects with CO Highway 14 to the south (MM 91) and CR 74E to the north. CR 69 and 68C are gravel and are maintained by Larimer County. Private roads and driveways intersect with the county roads and are privately maintained. There are three roads off of CR 68C. Mountain Plover (five homes), Eastern Sun Court and Shambhala Way (access the Drala Mountain Center). The elevation of the Manhattan Creek area ranges from 7800 feet in the south to 9200 feet in the west. County Road 69 has steep, tight switch backs. It's a three-mile stretch from Highway 14 to Goodell Corner, where CR 69 and CR 68C intersect at Goodell corner, and another seven miles on CR 69 to the intersection with CR 73E and Red Feather Lakes.

## Vegetation Type

The elevation in the Manhattan Creek area ranges between 7,800 and 9,200 feet. Vegetation consists mostly of ponderosa pine. Interspersed amongst the pine are other species of pine, fir, and fire-flashy Rocky Mountain juniper trees. Other trees in the area consist of blue spruce, Engelmann spruce, aspen. At this elevation there is still a fair amount of highly combustible sagebrush, chokecherry, willow, and current bushes. Tall prairie grasses reside along most of the roadways. During dry seasons of the year, this material would ignite quickly, carrying wildfire throughout the community.

## Manhattan Creek

The Manhattan Creek community is defined by the natural breaks between inhabited areas. The community borders are defined as:

- East Border – east side of Ben Delatour Scout Camp
- West Border – FS Road 171 C/D
- North Border – Intersection of CR 69 and FR 171 (north)
- South Borders – 1 mile north of Hwy 14

Legal -

Township 9 North, Range 72 West of the 6th PM Sections 18,19,30,31, and the south half of section 7

Township 9 North, Range 73 West of the 6th PM Sections 13,14,15,16,17,18,19,20,21,22,23, 24,25,26,27,28,289,30, and the south half of section 12

FR = Forest Road



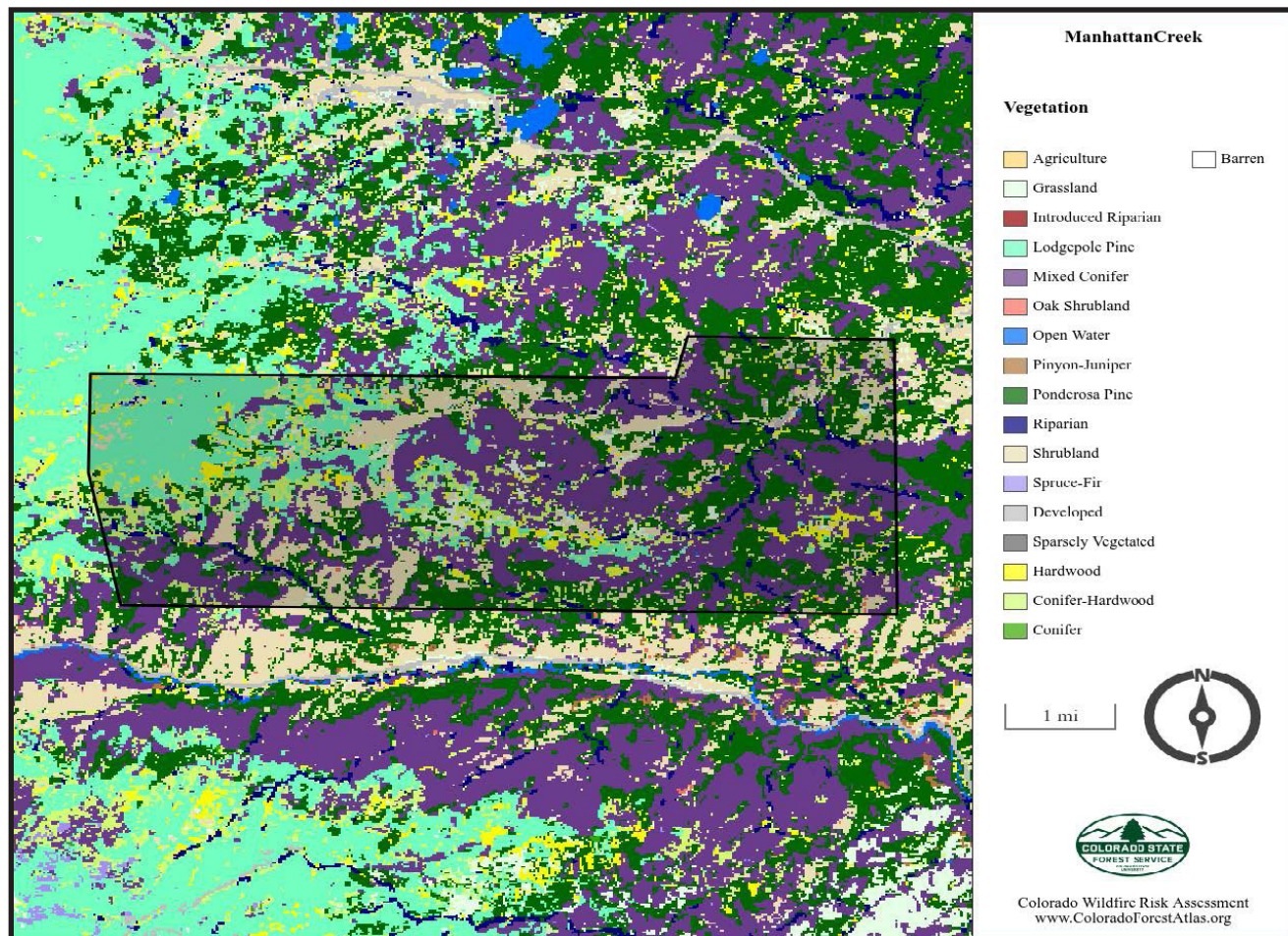


Figure 2.a.9 Vegetation in the Manhattan Creek treatment area is mixed conifer, ponderosa pine, with some lodge pole and shrubland. (Source: Colorado State Forest Service: Colorado Forest Atlas)

### Businesses in the area:

- Ben Delatour Scout Ranch
- Drala Mountain Center
- Poudre Canyon Station 4
- Elkhorn Lumber
- Elkhorn Excavating
- Beck's Automotive
- REA Manhattan Sub Station at the intersection of CR 69 and CR 68C (Goodell Corner) N 40° 44.118, W105° 34.937.

PCFPD's Station 4 in the Manhattan Creek area.



To see the entire [Colorado Wildfire Risk Assessment for the Manhattan Creek area](#), [click here](#).

### Trailheads in the area:

- Elkhorn Trailhead - hiking, horseback riding
- Forest Road 171 - jeep - 4WD
- Kelly Flats Trailhead - jeep - 4WD
- South Bald Mountain Cut-off - hiking
- Numerous non-designated campsites

Both the Ben Delatour Scout Ranch and the Drala Mountain Center have numerous structures on their property. There are 37 homes along the CR 68C.

### Evacuation Routes

- CR 68C east to CR 74E
- CR 69 south to Highway 14
- CR 69 north to CR 74E



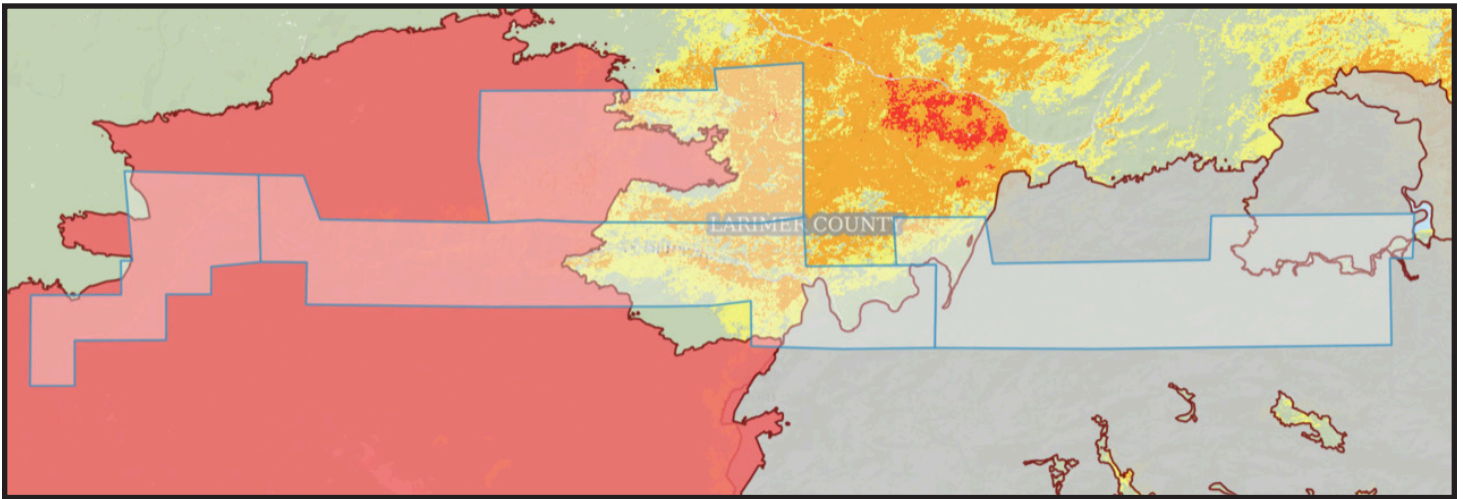


Figure 2.b.1 Grey is the location of High Park Fire in 2012, red is location of Cameron Peak Fire in 2020. Yellow and orange are unburned areas of PCFPD.

## 2.b. Wildland-Urban Interface

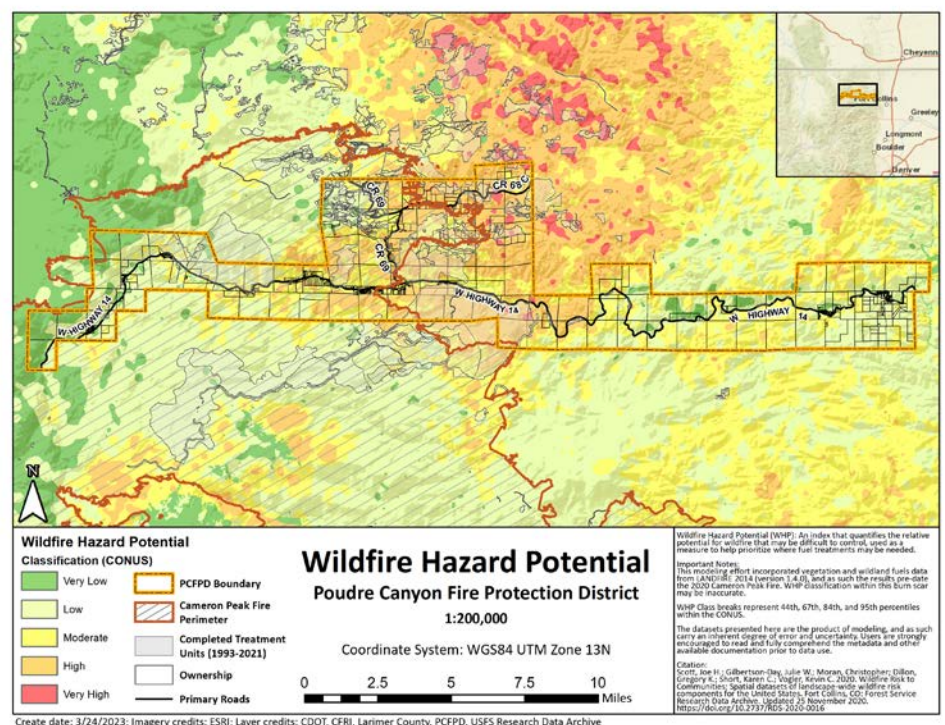
The Wildland-Urban Interface (WUI) is where the built environment meets areas prone to wildfires. It's a place where fires can spread from natural vegetation to communities, causing harm. People who live and work in the WUI need to understand how wildfires can affect their lives. The WUI can range from areas with a mix of housing and wildland vegetation to areas where houses are close to dense wildland vegetation.

All residents of Poudre Canyon Fire Protection District live in the Wildland-Urban Interface. Over the past 50 years, more people have moved to the mountains along the Colorado Front Range, leading to more buildings in this area. There has also been an increase in recreational activities in the forest. However, newcomers and visitors are often unaware of the potential fire hazards and may be careless with fire.

Wildfires in Colorado's WUI can cause significant damage. For example, the 2012 High Park Fire burned through part of the PCFPD, destroying 22 structures and affecting one-third of the district. The 2020 Cameron Peak Fire destroyed 30 structures and burned half of the district. While these fires have helped manage the forest in some ways, there are still large areas that haven't burned, especially around homes and businesses.

Figure 2.b.2 Shows the potential wildfire hazard throughout the PCFPD. Even though the High Park Fire and the Cameron Peak Fire reduced fuel load, most of the district is in the moderate to high potential for wildfire.

Map by Ben Wasserstein



PCFPD volunteers helping residents chip their slash. Photo by Ron Lonneman.



## **2.c. Resident Preparedness for Wildfire**

PCFPD volunteers have been assisting residents in burning their slash piles during winter for many years. In 2013, the district purchased a heavy-duty chipper to help residents chip their slash, which is a preferred method for many. In 2021, we received a grant to buy another heavy-duty chipper. Now we have chippers in both the upper and lower canyon to help residents manage their property.

PCFPD volunteer firefighters evaluated each of the four communities in the district while writing this CWPP. They found that many neighborhoods lack proper defensible space around homes. In several areas, driveways and roads are too small for fire engines to access, bridges are not labeled with weight capacities, and roadways are not adequately cleared for survival during a fire. Some residents are unaware of the risk they face or mistakenly believe that the High Park Fire and Cameron Peak Fire have eliminated the danger. A 2021 study conducted by the University of Colorado-Boulder revealed that homeowners living in the WUI in Bailey, CO often underestimate the risk their homes face from wildfires and overestimate the protective measures they have taken (Simpkins 2021).



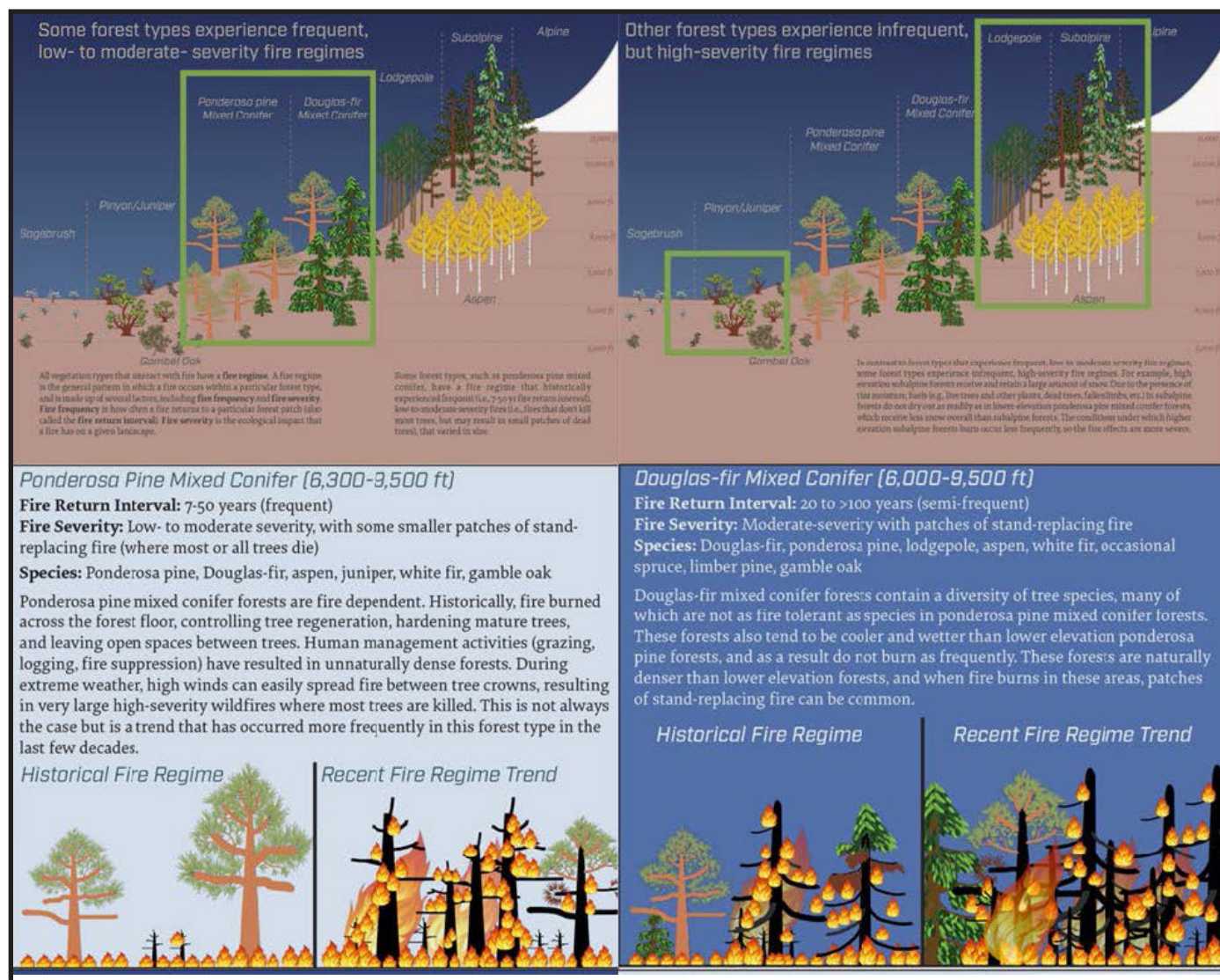
Colorado's Front Range has a long history of fires, especially before people started actively trying to stop them. The land where these fires occurred originally belonged to the Cheyenne, Eastern Shoshone, and Arapaho Native American tribes. These tribes used fire as a way to manage the land. Lightning-caused fires were common in the ponderosa pine and dry mixed-conifer forests even before Europeans settled in the area in the 1850s.

## 2.d. Fire History Along the Colorado Front Range

The forests of ponderosa pine and mixed-conifer are well-suited to wildfires and can recover from them easily. Fires of low to moderate intensity happened every seven to 50 years. Sometimes, more severe fires would completely destroy the stands of trees. Frequent fires would prevent the growth of many young trees, which stopped the build-up of flammable materials and reduced the chance of fires spreading to the tops of the trees. Although fires would spread quickly through grasses on the forest floor, they didn't release as much heat, so larger trees could survive without harm. Occasionally, groups of trees would be killed by a fire that moved from one treetop to another, which made the ecosystem more diverse. These forests had a mix of widely spaced trees and small groups of trees mixed with grasslands and shrublands, especially on drier south-facing slopes. Forests on north-facing slopes tended to be denser (Addington et al., 2018).

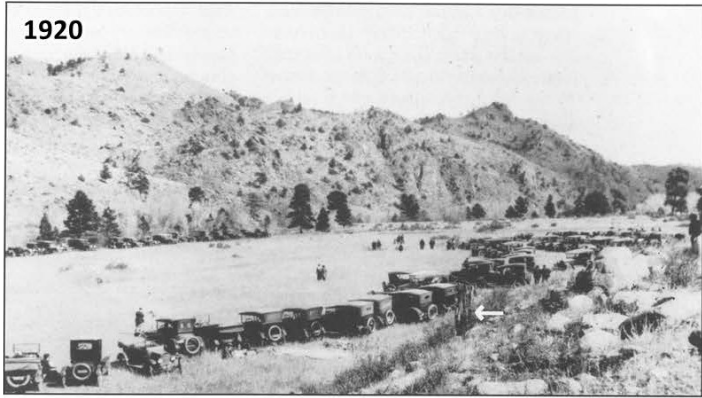
Ponderosa pine forests with fewer trees had more diverse grasses, flowers, and shrubs growing underneath them, providing habitat for a variety of wildlife that preferred more open forests (Matonis and Binkley, 2018; Kalies et al., 2012; Pilliod et al., 2006). When

Figure 2.d.1. Ponderosa pine forests along the Colorado Front Range historically experienced frequent fires every seven-50 years and mixed-conifer forests experienced semi-frequent fires every 20 to >100 years, resulting in less dense forest conditions than we see today. (Source: Colorado Forest Restoration Institute)

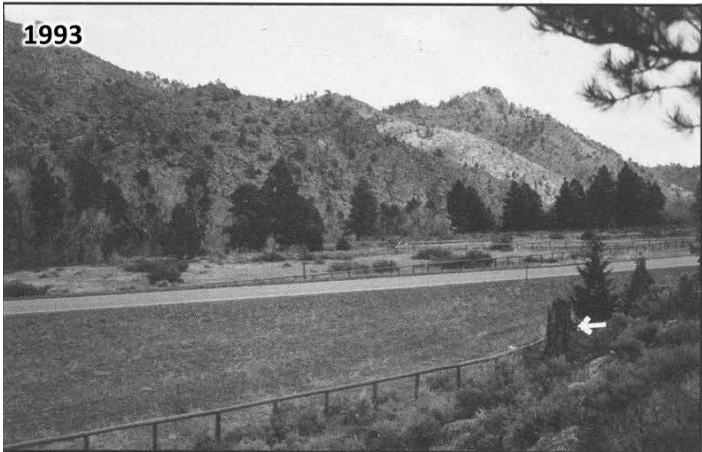




## Clearing in Indian Meadows

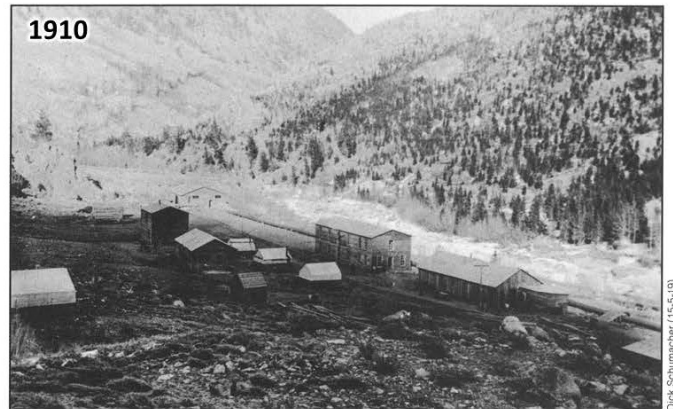


Norman Fry (3-3-12)



Stan Case (CC-1-8)

## Laramie-Poudre Tunnel Work Site



Dick Schumacher (15-5-19)



Stan Case (D-7-34)

Figure 2.d.2. Tree densities have remained low in some ponderosa pine savannas areas (photos on left), but in other ponderosa pine and mixed-conifer forests, particularly north-facing slopes, tree densities are substantially higher today than they were historically in part due to fire suppression (photos on right). Photos credits: Norman Fry, Stan Case, and Dick Schumacher. (Source: Case 1995)

European settlers came to the region and started ranching and logging, the forests became denser because of the absence of frequent fires. The government also started putting out fires as a policy in the late 1800s. This led to forests growing back with trees of the same age, creating many dense forest areas (Addington et al., 2018). Even though many people think of dense forests as “natural,” they are very different from the resilient ecosystems that existed before. These continuous forests are more susceptible to severe fires that are hard to control and can cause extensive damage to lives and property (Haas et al., 2015).

In addition to forests, the Front Range area also has shrublands called Rocky Mountain Lower Montane-foothill shrublands. These shrublands are dominated by mountain mahogany and have native grass species like mountain muhly, blue grama, sideoats grama, Arizona fescue, and other grasses. Some non-native grasses like cheatgrass, smooth brome, and Kentucky bluegrass have also been introduced in the area (Decker et al., 2020). These shrublands are important for animals like mule deer and elk, which feed on the vegetation. Fire is a natural part of the Rocky Mountain Lower Montane-foothill shrubland ecosystem, and historically, these areas experienced fires every 14 to 112 years, with different levels of severity depending on local factors (Missoula Fire Sciences Laboratory, 2012; Decker et al., 2020).



In the Front Range of Colorado, there are certain conditions that can lead to dangerous wildfires. These conditions include extreme heat, high winds, and dry vegetation in the wildland areas. Climate change is making the situation worse by increasing the risk of wildfires and prolonging the fire seasons.

Historically, many devastating wildfires in Colorado have happened on dry and windy days. These fires spread quickly over short periods of time. On the Front Range, the wind can reach speeds of over 62 miles per hour, which makes it very difficult to control or put out wildfires.

When there are red flag warnings, it means that the weather conditions are severe and there is a high risk of fire. During these times, fire departments and residents need to be extra careful and vigilant. The number of red flag warnings can vary greatly from year to year because of regional weather patterns and anomalies like El Niño and La Niña. From 2006 to 2020, the PCFPD experienced anywhere between 0 and 32 red flag warnings per year. The highest number of warnings occurred in 2012 and 2020, which were the years when the High Park and Cameron Peak Fires happened. Red flag conditions are most common in March, April, June, September, and October in this area.

Between 2000 and 2022, there were 122 fire starts in and around the PCFPD. However, most of these fires were quickly contained and did not grow into large wildfires. This was due to the prompt response of local firefighters and favorable weather conditions for firefighting. About 75% of the fires were limited to an acre or less in size, and only three fires during that time grew to over 100 acres.

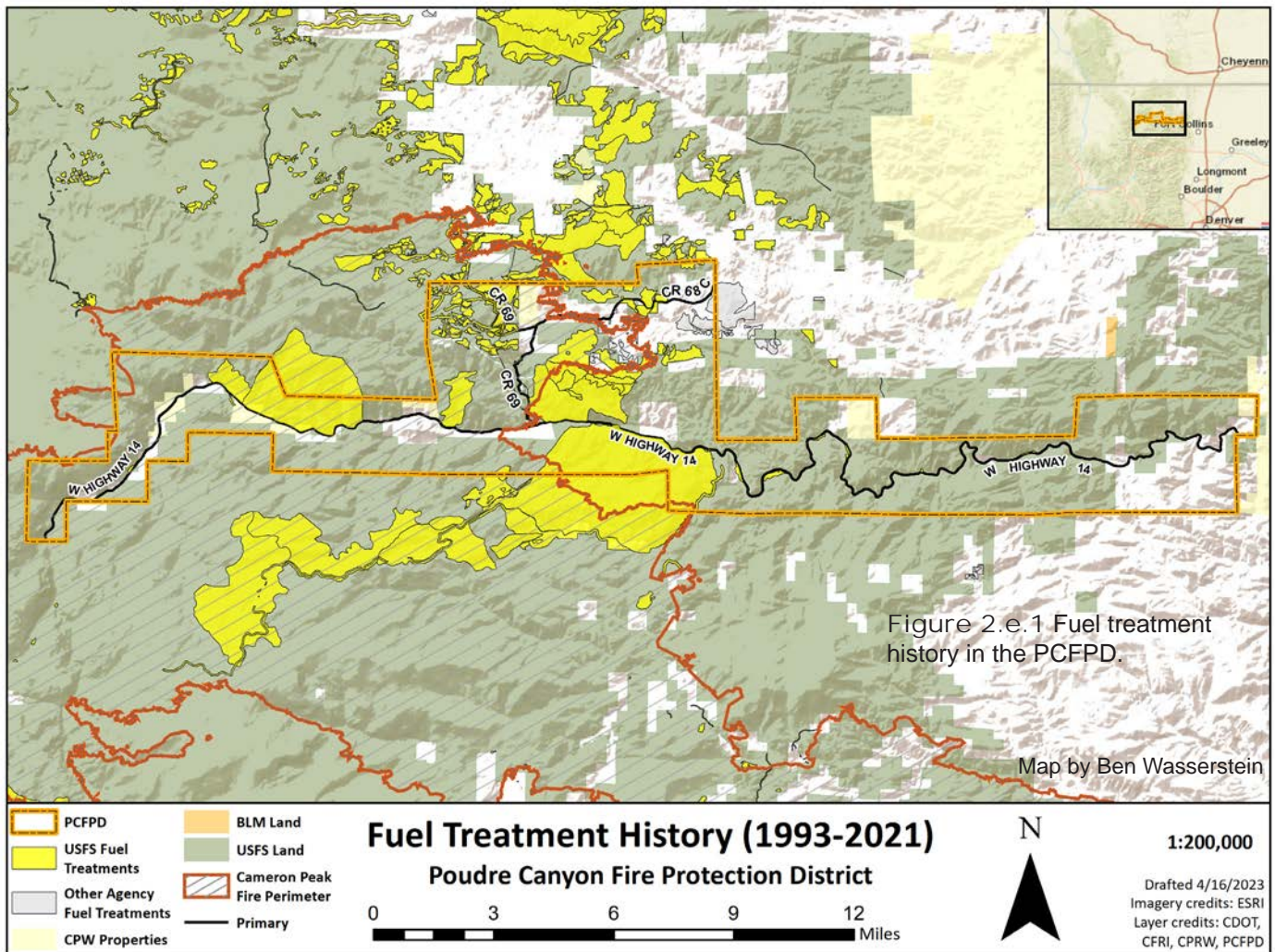
Several significant wildfires have occurred in and around the PCFPD between 2004 and 2020. The High Park Fire in 2012 burned through the eastern part of the district and destroyed 22 structures. However, the reduced vegetation from that fire helped stop the spread of the Cameron Peak Fire in 2020. The Cameron Peak Fire became the largest wildfire in Colorado's history, covering an area of 208,660 acres and destroying 461 structures, including 224 homes. During the year of the Cameron Peak Fire, the PCFPD had responded to seven fires within or close to the district. Despite these large and small fires, there is still a significant amount of forest in the district that has not burned.

Therefore, the PCFPD is still at risk of severe wildfires because of the dense forest, tall grasses, dry and hot weather, and strong winds in the area. The increasing drought and rising temperatures worsen the risk of wildfires. The PCFPD and residents in the district need to be prepared for large wildfire events.

A common sight after the Cameron Peak Fire burned through this area in 2020.  
Photo by Paula Collins.







## 2.e. Fuel Treatment History in and around the PCFPD

### Overview of fuel treatment by USFS

The above map shows where USFS has been doing forest treatment. The new [Black Diamond](#) treatment plan for forest health and mitigation unfortunately does not include most of PCFPD.

### Overview of fuel treatment by Drala Mountain Center

Drala Mountain Center has completed 160 acres of mechanical forest restoration treatments since late 2018. These acres were treated over two phases, and were managed by LCD and funded with the Natural Resources Conservation Service's Environmental Quality Incentives (EQIP) Program as well as the Colorado State Forest Service's Forest Restoration and Wildfire Risk Mitigation Grant (FRWRM).

The goals of the projects were to

- 1.) reduce the risk of catastrophic wildfire
- 2.) improve the quality and quantity of wildlife habitat and
- 3.) benefit overall forest health and resilience to pests, disease, and disturbance.

To achieve these goals, roughly 70% of trees within the project site were cut, chipped, and hauled off site. Trees were strategically thinned to reflect the historic structure and composition of Drala's forest stands. In other words, the project aimed to create the "groupy-clumpy" forest structure that stand reconstruction surveys have demonstrated for historical ponderosa pine forests. Since all forest products generated through these projects were removed from the site, surface fuel loading was minimal, positively impacting the survival of treated stands during the 2020 Cameron Peak Fire.



## **Overview of fuel treatment by Ben Delatour Scout Ranch**

The Ben Delatour Scout Ranch (BDSR) was purchased from the Weaver Ranch in the mid 1950's by banker Ben Delatour from Greeley and donated to the Longs Peak Council (now Adventure West Council) based in Greeley. Stipulation was that it must remain a working ranch property, hence Scout Ranch not Scout Camp as the name. At over 3200 acres, it is the largest Scout property in the area and supports five different programs including two forms of summer camp – dining hall based, and patrol cooking based; a high adventure base, a National Youth Leadership Training area, and a 27-acre Jack Nicol Cub Scout camp around Shotgun Lake. Fire and EMS support is provided by the Poudre Canyon Fire Protection District with the coverage break at the Section 17, 18, 19, 20 intersections T9N, R72W.

### **Fire Hazards and Safety:**

Conservation training is strongly embedded in the Scouting outdoor programs. Many merit badges support conservation and teach a variety of skills, techniques, and concepts to support a sustainable and vibrant ecosystem. For example, erosion control and trail maintenance use soil conservation concepts to design trail locations, tread, drainage, and low maintenance design and self-cleaning water bars and drains. Forest health, thinning, leaf tree selection, insect and disease control also represent forestry concepts taught and practiced on Scout properties. The fires of 1988 in Yellowstone galvanized the leadership and spurred an acceleration of modest thinning efforts that had begun around 1986. The conservation committee began cooperative agreements and grants to actively manage the mitigation efforts and defensible space for all the developed areas of BDSR. Firewise concepts directed the defensible space designs, and significant forest thinning and commercial harvest followed to return the fire resilient ponderosa pine stands to their pre-homestead natural state. Using restoration style treatments, Bob Sturtevant has designed and managed this fire reduction effort and actively recruits cooperators and grant based efforts to reduce fuel loads and expand thinning efforts along all access roads and surrounding areas. Prescribed fire includes both pile burns under county and fire department permit, and broadcast burns conducted by trained and certified practitioners like the Nature Conservancy and Ember Alliance. The future installation of a formal helispot is planned, as BDSR has flight for life access at the main parking area.

### **Neighboring Efforts and Issues:**

Shambhala Mountain Center, now renamed the Drala Mountain Center is the BDSR western neighbor. Three sides of BDSR are surrounded by US Forest Service and the eastern boundary is shared with Glacier View and the North Rim Road. The Cameron Peak fire severely impacted the Drala property; however, BDSR's decade old mitigation efforts and crown thinning stalled the wind driven crown fire, and brought it to ground level where dozer line and lighter fuels stopped the spread on the night it ran over 55K acres from the Pingree Hill road to BDSR. This area is a vital training opportunity for landowners and demonstrates the value of mitigation efforts to protect against wildfire. A 450 acre prescribed burn on BDSR's eastern boundary experienced an unplanned wind driven expansion of about 100 acres into Glacier View. This burn inadvertently resulted in a fuel break and lowered fire potential upwind of Glacier View. This now provides a significant fuel break from the prevailing northwest wind direction. Further efforts on the North Rim Road and adjacent Elkhorn mitigation efforts on BDSR will grow and expand

these fire reduction efforts.

### **Challenges and Opportunities:**

Excel Energy lobbied to remove fireplaces in the Front Range on the basis of smoke and the Denver air basin. Correct or not, the end result has been a significant loss of any viable firewood market. Thinned materials are burned in piles, or chipped and distributed on trails, roads, and as mulch where needed to stabilize soils. Contract forest harvests have reduced the fire hazard and overall forest density in the Cub Scout Camp (~1996-97) and in Camp Jeffrey and Drala in 2021-2022. BDSR is pursuing a volunteer agreement with the US Forest Service for several slivers along County Road 68C adjacent to the BDSR boundary because these small slivers are not efficient areas for USFS Magic Feather prescribed burn efforts. BDSR has conducted landowner training for pile construction techniques, and several of our cooperators use the BDSR property for S-212 Power Saws training, certification and practice. The ROTC from CSU also annually uses the outback area for high adventure base navigation exercises and uses the Jack Nicol cub camp as their base of operations for their training cadre.

### **Fire Logistics and Infrastructure:**

The Cameron Peak fire teams used the Cub Camp as the fire base for food service and supply, while the main Incident Command Post was at the Chrisman Field site in north Fort Collins. The helibase and tanker base were set in the outback meadow at High Adventure Base, and many heavy lift retardant loads using Sikorsky sky cranes filled by snorkel in the tanker base mixing tanks. Former BDSR ranger John Zumbro was the station captain at PCFPD Station 4, and Karl Brown served as the Infrared Interpreter for the High Park fire in 2012, retired from the NPS in 2020 and is an available volunteer firefighter based at Station 4.

### **Landowner Support:**

Both Karl Brown and Bob Sturtevant are willing to discuss BDSR efforts and recommended treatments to surrounding neighbors and community wildfire cooperators. Although both live in Fort Collins, they regularly work on the BDSR property and actively manage hazard trees, pile burns, and infrastructure improvements to the Cub Camp and main Scout Ranch program areas.

Burning piles on the Ben Delatour Scout Ranch  
January 2023.  
Photo by Maya Daurio.







PCFPD volunteers are getting ready for training 2022. Photo by Hugh Collins.

## 2.f. District Capacity (2023)

Poudre Canyon Fire Protection District is made up entirely of volunteers. They have a total of 35 volunteers who dedicate their time and efforts to the district. The organization was established back in 1959 as a fire protection district under Colorado CRS Title 32. The operations of PCFPD are overseen by a five-member Board of Directors.

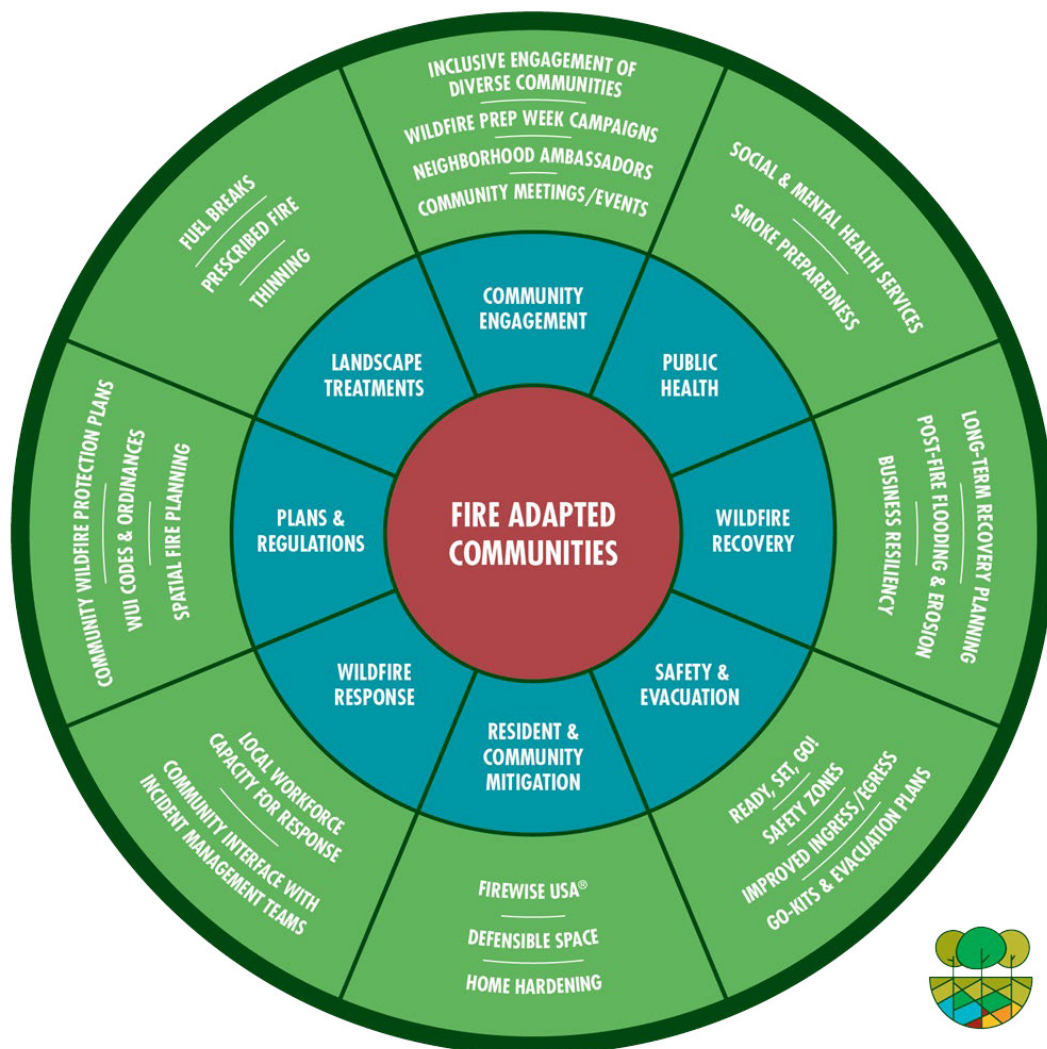
Within PCFPD, positions include a fire chief, an assistant chief, two battalion chiefs, four station captains, 29 firefighters, and nine personnel who are trained as Emergency Medical Technicians (EMTs). The fire chief manages the operations. All members of PCFPD receive training up to the National Wildfire Coordination Group (NWCG) S-130/S-190 level.

PCFPD equipment consists of one Type 2 engine with a capacity of 2100 gallons and a pump rate of 500 gallons per minute, four Type 6 engines specifically designed for wildland and initial attack situations, equipped with Compressed Air Foam Systems (CAFS), two standard Type 6 engines, one Type 3 engine provided by the Colorado Division of Fire Prevention and Control (DFPC), and two Basic Life Support (BLS) ambulances. PCFPD has four fire stations strategically located within the district's populated areas. The district has been actively working on upgrading its equipment and fire stations. However, they still require a tender and ambulance for Station 1, as well as a four-wheel drive ETA type 7 vehicle equipped with a fire package, plow package, stretcher package, and track system. They also need two Starlink mobile systems, to a repaired dry well, and add a new water access point in the upper canyon.

PCFPD relies on the Larimer County Sheriff dispatch center for communications. They have both 800 DTR and VHF radio capabilities. Additionally, they utilize the NOCO Alert emergency notification system provided by the Larimer Emergency Telephone Authority. PCFPD receives support from four neighboring volunteer fire districts through mutual-aid agreements. These districts include Glacier View Fire Protection District to the northeast, Red Feather Lakes and Crystal Lakes to the northwest, and Rist Canyon to the south. These agencies have similar personnel, capabilities, and equipment, and they respond with PCFPD for initial attack responses when requested.

During wildfires, an Emergency Services Technician or Specialist from the Larimer County Sheriff's Office (LCSO) Emergency Services unit is dispatched to the district. This person acts as a connection to other mutual-aid resources in the county, such as Poudre Fire Authority, Wellington Fire District, Loveland Fire Rescue Authority, US Forest Service (USFS), and the DFPC. If the incident becomes too large for PCFPD to handle, the LCSO assumes command and can establish a Type III incident command organization if necessary. Additionally, a Single Engine Air Tanker (SEAT) is usually available from spring to fall in the northern front range to support firefighting efforts.

Figure 3.1. The Fire Adapted Communities graphic provides specific programs and activities that communities can take to reduce their wildfire risk and increase their resilience. (Source: [Fire Adapted Community Learning Network](#)).



### 3. Becoming a Fire Adapted Community

It is recommended that that the residents of the PCFPD embrace the concept of Fire Adapted Communities (FAC), which is defined by the National Wildfire Coordinating Group as “a human community consisting of informed and prepared citizens collaboratively planning and taking action to safely coexist with wildland fire”. This concept can guide residents, firefighters, and communities through a holistic approach to become more resilient to fire (Figure 3.1)

This CWPP sets the stage for fire adaptation, and the next step is action and an ongoing commitment to risk mitigation at all levels of the community, from individual homeowners to neighborhoods and to land managers and other partners. This section of the CWPP includes recommendations and resources for mitigating wildfire risk and enhancing emergency preparedness. The PCFPD and public land managers have an important role to play in implementing the recommendations in this CWPP, and they have made commitments to take on-the-ground action as outlined in Section 4., Implementation Recommendations for Fuel Treatments.

Information in the following sections is provided by Ember Alliance

Individual homeowners, and neighborhoods have a vital role to play in addressing shared wildfire risk. Action and community-building centered around mitigation have reduced wildfire risk and increased community resilience across the mountain west. Mitigation work by residents can spur mitigation by their neighbors (Brenkert-Smith et al., 2013). The cumulative impact of linked defensible space across private properties can improve the likelihood of home survival and protect firefighters during wildfire events (Jolley, 2018; Knapp et al., 2021).



## Mitigate the Home Ignition Zone

Homeowners can increase the likelihood that their home will survive a wildfire and help protect the safety of firefighters by creating defensible space, replacing, or altering building materials to make the home less susceptible to ignition, and taking steps to increase firefighter access along the driveway.

During catastrophic wildfires, property loss happens mostly due to conditions in the home ignition zone (HIZ). The home ignition zone includes the home and other structures (e.g., sheds and garages) and the area within 100 feet of each structure. Firefighter intervention, adequate defensible space, and home hardening measures were common factors for homes that survive major wildfires (IIHBS 2019; Maranghides et al. 2022). Research following the 2018 Camp Fire showed that homes were more likely to burn when they were close to other structures that had also burned, when they had vegetation within about 330 feet of the home, and when they had combustible materials (firewood or propane tanks) near the home (Knapp et al. 2021).

Defensible space is the area around a building where vegetation, debris, and other types of combustible fuels have been treated, cleared, or reduced to slow the spread of fire and reduce exposure to radiant heat and direct flame. It is encouraged that residents develop defensible space so that during a wildfire their home can stand alone without relying upon limited firefighter resources due to the great reduction in hazards they have undertaken.

Home hardening is the practice of making a home less likely to ignite from the heat or direct contact with flames or embers. It is important to remember that embers can ignite homes even when the flaming front of a wildfire is far away. Home hardening involves reducing this risk by changing building materials, installation techniques, and structural characteristics of a home. Home hardening measures are particularly important for WUI homes; 50 to 90% of homes ignite due to embers rather than radiant heat during wildfires (Babrauskas 2018; Gropp 2019).

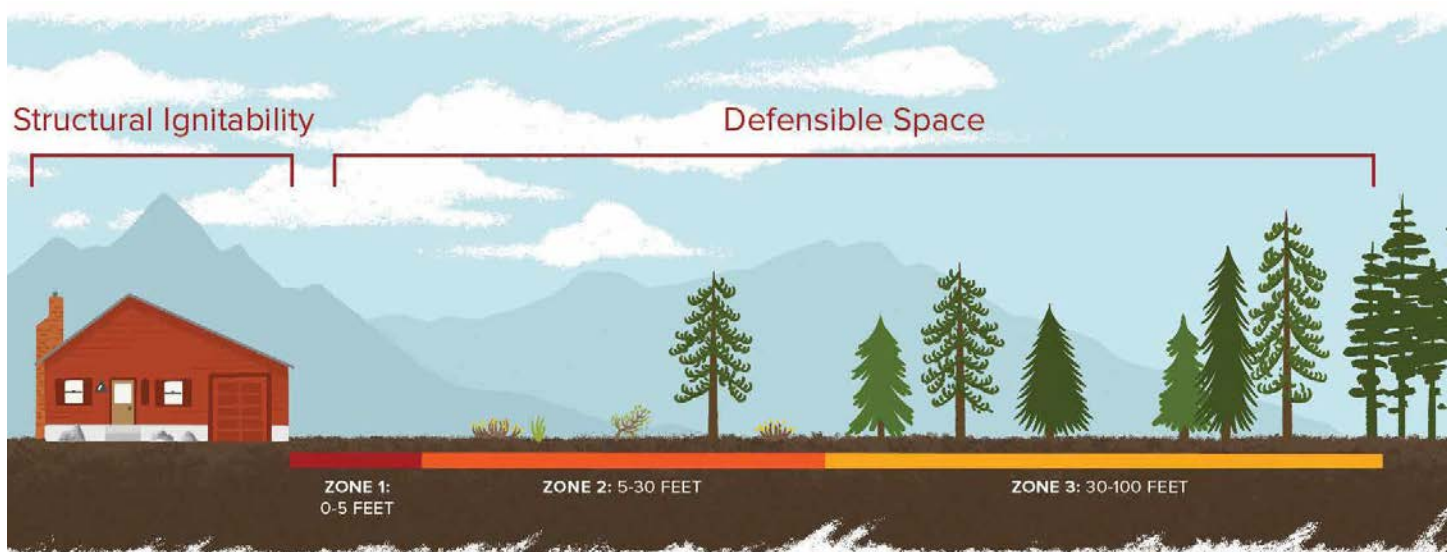


Figure 3.a.1. Defensible space zones recommended by the Colorado State Forest Service. (Source: Colorado State Forest Service, Bonnie Palmatory).

## 3.a. Individual Recommendations



Figure 3.a.1. Part 2 Defensible space zones recommended by the Colorado State Forest Service. (Source: Colorado State Forest Service, Bonnie Palmatory).

## Defensible Space

Residents can create defensible space by reducing the amount of vegetation and flammable materials (i.e., pine needles, stacked firewood, patio furniture) within the HIZ trees, and shrubs that could ignite during a wildland fire. Defensible space can slow the spread of wildfire, prevent direct flame contact, and reduce the chance that embers will ignite material on or near your home (Hakes et al. 2017). Substantially reducing vegetation within the HIZ and removing vegetation that overhangs decks and roofs can reduce structure loss, especially for homes on slopes (Syphard et al. 2014).

Defensible space is divided into multiple zones around a home, and recommended practices vary among zones. The CSFS defines Zone 1 as 0 to 5 feet from the home, Zone 2 as 5 to 30 feet from the home, and Zone 3 as 30 to about 100 feet from the home. Some organizations call Zone 1 the “noncombustible zone” (0 to 5 feet from the home) and Zone 2 the “lean, clean, and green zone” (5 to 30 feet from the home). Residents should establish defensible space around each building on their property, including detached garages, storage buildings, barns, and other structures.

A 2021 study from the University of Colorado-Boulder showed that homeowners living in the WUI in Bailey, CO typically underestimated the level of risk their home is at due to wildfire, and tended to overestimate the amount of work they have done to protect their property (Simpkins, 2021). Make sure you are informed about best practices for protecting your home. See Figure 3.a.1, and the CSFS publication the [Home Ignition Zone](#) for recommendations. See Section 4.b. Stand-Level Fuel Treatment Recommendations for



specific recommendations by forest type.

It is important for residents to work together as a community to mitigate shared wildfire risk. Structure-to-structure ignition is a major concern in WUI communities and can cause substantial property loss. Neighbors can increase their homes' chances of survival during a wildfire if they work together to reduce hazards in their overlapping defensible space.

Do not count on firefighters staying to defend your home—your home should be able to survive a wildfire on its own. There are never enough firefighters to stay and defend every single home during large incidents. Properties that are not defensible will often not receive firefighter resources due to unsafe conditions and the higher likelihood of home loss.

Following are defensible space recommendations for homes in the WUI based on the CSFS publication *The Home Ignition Zone*. This is not an all-inclusive list of activities. Specific measures will depend on the placement and condition of your property.

### **Zone 1: 0 to five feet from your home – the noncombustible zone.**

#### **Goal: Prevent flames from having direct contact with your home.**

- Create a noncombustible border 5 feet around your home (aka, hardscaping). Replace flammable wood chips with alternatives like dirt, stone, or gravel.
- Remove branches that hang over your roof and drop needles onto your roof and remove all fuels within 10 feet of the chimney.
- Remove combustible materials (dry vegetation, wooden picnic tables, juniper shrubs, etc.) from underneath, on top of, or within 5 feet of decks, overhangs, windows, and doors.
- Annually remove dead or dry leaves, pine needles, and dead plants within five feet of your home and off your deck, roof, and gutters. Raking material farther than five feet from structures will not significantly reduce the likelihood of ignition and can negatively affect other trees.
- Move firewood or other combustible materials to Zone 3.
- Do not use space under decks for storage.

### **Zone 2: Five to 30 feet from your home – the lean, clean, and green zone.**

#### **Goal: Slow the movement of flames approaching your home and lower the fire intensity.**

- Irrigate and mow grasses to four inches tall or less. When water restrictions limit water use, keep grasses mowed and consider xeriscaping within Zone 2.
- Remove any accumulated surface fuels such as logs, branches, slash and mulch.
- Remove common junipers because they are highly flammable and tend to hold a layer of flammable material beneath them, and replace with plants that have more fire-resistant attributes, like short-statures, deciduous leaves, and higher moisture content. See [FireWise Plant Materials](#) from Colorado State University Cooperative Extension for suggestions.
- Remove enough trees to create at least 10 feet of space between crowns. Measure from the outermost branch of one tree to the nearest branch on the next tree. Create even more space between trees if your home is on a slope. See Figure 3.a.2 for how to measure crown spacing.

- Small groups of two or three trees may be left in some areas of Zone 2. Spacing of 30 feet should be maintained between remaining tree groups to ensure fire doesn't jump from one group to another.
- Remove ladder fuels under remaining trees. This is any vegetation that can bring fire from the ground up into taller fuels.
- Prune tree branches to a height of six -10 feet from the ground or a third of the total height of the tree, whichever is less. See Figure 3.a.2 for a depiction of how to measure limb height.
- Keep spacing between shrubs at least two to three times their height.
- Relocate wood piles and propane tanks to Zone 3.
- Remove stressed, diseased, dead, or dying trees and shrubs. This reduces the amount of vegetation available to burn and improves forest health.
- Keep shrubs at least 10 feet away from the edge of tree branches.

### Zone 3: 30 to 100 feet from your home

**Goal: Slow movement of flames, move fire to the ground, reduce ember production.**

If you live on a slope, this zone may be larger to gain the full benefits of defensible space.

- Store firewood and propane tanks at least 30 feet away and uphill from your home and away from flammable vegetation. Store even farther away if your home is on a slope.
- Mow or trim grasses to maximum height of 6 inches. Grasses can be taller in Zone 3 than Zone 2 because of the greater distance from your home, but shorter grass is always better for reducing potential flame lengths and therefore radiant heat exposure.
- Remove enough trees to create at least 10-foot spacing between the outermost branches of remaining trees. Create even more space between trees if your home is on a slope. See Figure 3.a.2 for a depiction of how to measure crown spacing.
- Remove limbs so branches do not hang below 10 feet above the ground. See Figure 3.a.2 for a depiction of how to measure limb height.
- Remove shrubs and saplings that can serve as ladder fuels.
- Remove heavy accumulations of dead trees and branches and piles of fallen leaves, needles, twigs, pinecones, and small branches. Thin trees to increase spacing and remove ladder fuels to reduce the likelihood of torching, crown

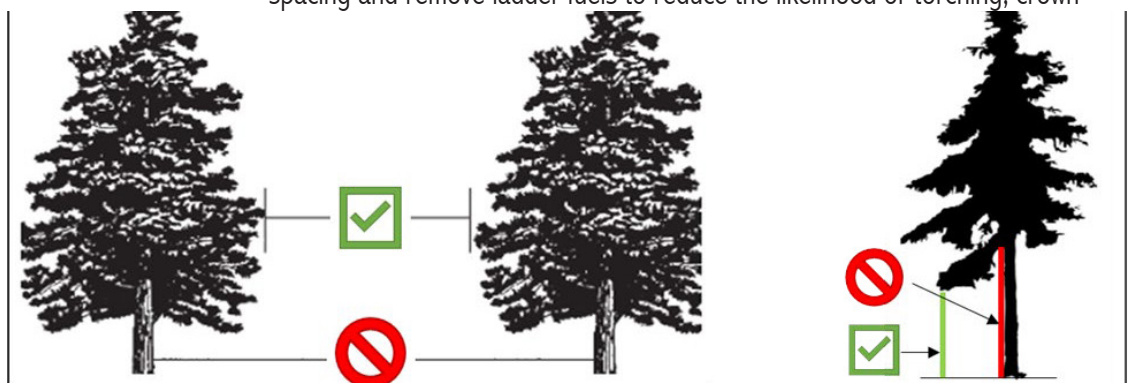


Figure 3.a.2. Spacing between tree crowns is measured from the edge of tree crown to tree crown, NOT from tree stem to tree stem (left). Height of limbs above the ground is measured from the ground to the lowest point of the limb, NOT from where the limb attaches to the tree (right). Source: Colorado State Forest Service.



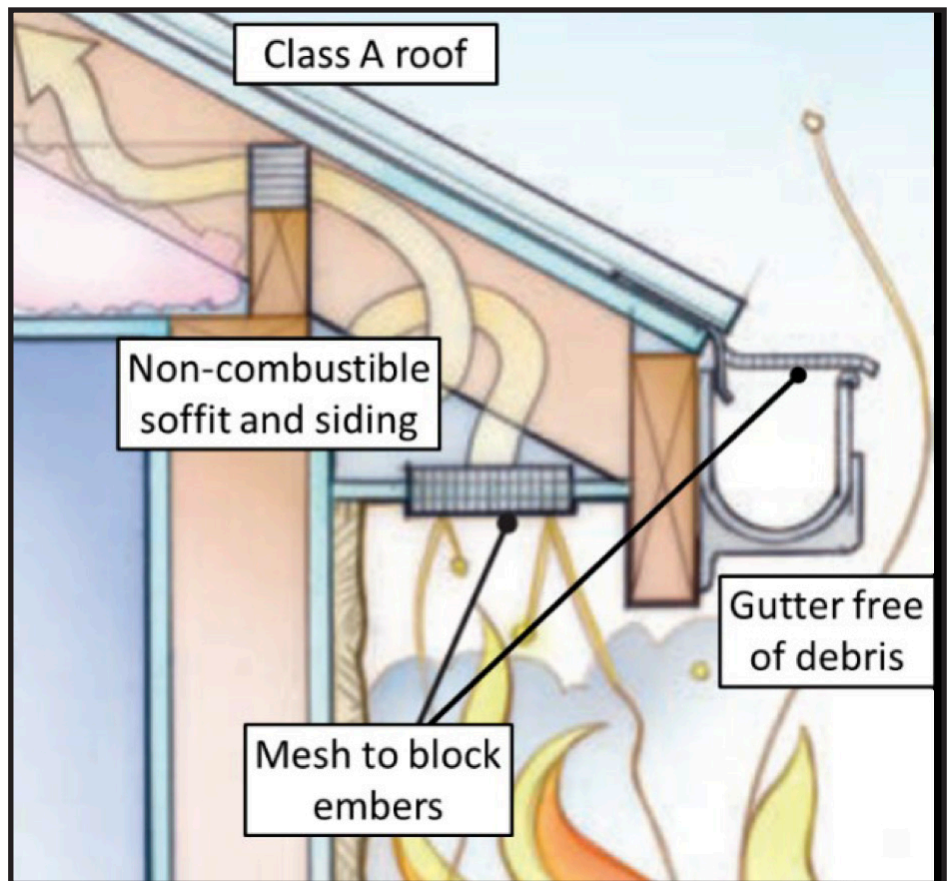
Some homeowners in the WUI are concerned that removing trees will destroy the forest and reduce the aesthetic and monetary value of their property. In fact, many dense ponderosa pine forests are unhealthy and greatly diverged from historical conditions that were maintained by frequent wildfires (Figure 2.d.1). The reality is that nothing will decrease the aesthetic and monetary value of your home as much as a high-severity wildfire burning all the vegetation in the community, even if your home survives the fire. Forest management can look messy and destructive in the first years following treatment; however, grasses, shrubs, and wildflowers will respond to increased light availability after tree removal and create beautiful ecosystems with lower fire risk (Figure 3.a.3).

Many residents enjoy their land even more after conducting effective fuel treatments. Removing trees can open incredible views of mountains, rivers, and rock formations, and wildlife are often attracted to forests with lower tree densities and a greater abundance of understory plants. Many residents feel safer in a forest that is less dark and more open, and they rest easier knowing firefighters would have a greater chance of safely defending their home. It might even be said that the more trees you cut, the more trees you save from wildfire. Reducing fuel loads and increasing the spacing between trees also increases the chance that your home and your neighbors' homes will survive a wildfire. See Section 4.b. Stand-Level Fuel Treatment Recommendations for more information on treatments that achieve ecological and fuel reduction objectives.



Figure 3.a.3. Grasses, shrubs, and wildflowers recovered quickly after tree removal in this ponderosa pine forest at the Drala Mountain Center near PCFPD Station 4. This beautiful and restored ecosystem is less susceptible to high-severity crown fire and can help reduce risk of wildfire damage to surrounding communities. The image below shows the diverse understory ecosystem that can recover within 1-3 years of removing trees and increasing light availability in ponderosa pine ecosystems. Photo credit: Larimer Conservation District (<https://www.fortcollinscd.org/before-and-after.html>).

Figure 3.a.4 depicts important home hardening measures. Residents can increase their homes' chance of survival by making it harder for embers to enter and ignite their homes. (Image from Healthy Building Science).



## Home Hardening

Home hardening involves modifying your home to reduce the likelihood of structural ignition. Buildings cannot be made fireproof, but the chance of your home surviving wildfires increases when you reduce structural ignitability through home hardening in tandem with the creation and maintenance of defensible space.

Roofs, vents, windows, exterior siding, decks, and gutters are particularly vulnerable to wildfires. Research on home survival during wildfires demonstrates that enclosed eaves and vent screens can reduce the penetration of wind-born embers into structures (Hakes et al. 2017; Syphard and Keeley 2019). Multi-pane windows have greater resistance to radiant heat. Windows often fail before a home ignites, providing a direct path for flames and airborne embers to enter a home (CSFS 2021).

It is important to replace wood or shingle roofs with noncombustible materials such as composition, metal, or tile. Ignition-resistant or noncombustible siding and decking further reduce the risk of home ignition, particularly when homes also have a five-foot noncombustible border of dirt, stone, or gravel. Non-wood siding and decking are often more durable and require less routine maintenance.

There are many low-cost actions you can start with to harden your home. Keep home-hardening practices in mind and use ignition-resistant materials if you replace a hail-damaged roof or remodel your home. Many home hardening practices are required in Larimer County per building construction regulations effective as of February 2019 for homes within the Wildfire Hazard Area. New construction and expansions adding 50% or more area must comply with the new building standards.



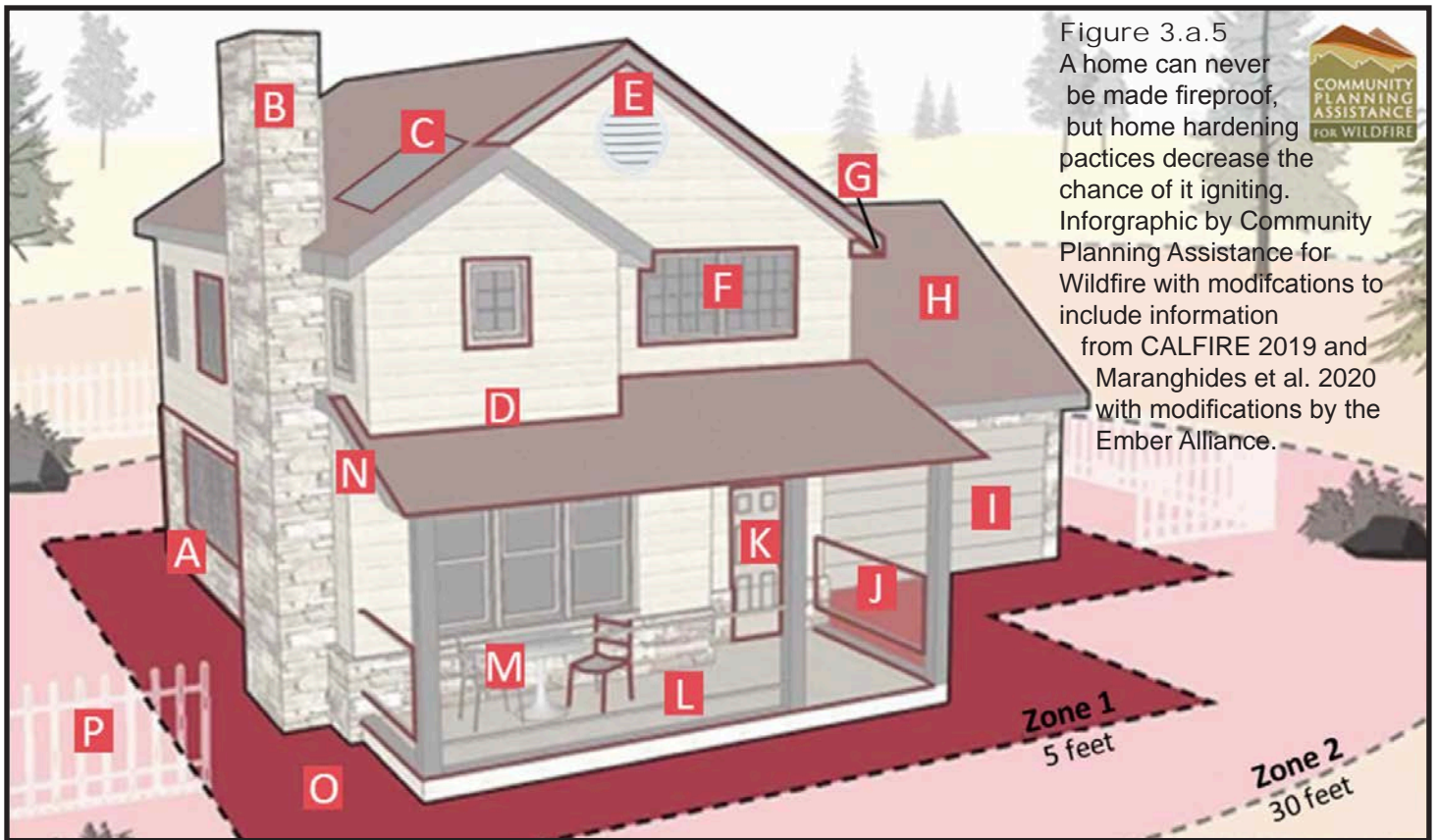


Figure 3.a.5  
A home can never be made fireproof, but home hardening practices decrease the chance of it igniting. Infographic by Community Planning Assistance for Wildfire with modifications to include information from CALFIRE 2019 and Maranghides et al. 2020 with modifications by the Ember Alliance.

## Low-cost actions

- B. Cover chimneys and stovepipe outlets with 3/8th to 1/2 inch corrosion-resistant metal mesh.
- C. Minimize debris accumulation under and next to solar panels.
- E. Cover vent openings with 1/16th to 1/8th inch corrosion-resistant metal mesh. Install dryer vents with metal flappers and keep closed unless in use.
- G. Clear debris from roof and gutters regularly.
- I. Install metal flashing around and under garage doors that goes up at least six inches inside and outside the door.
- J. Use noncombustible lattice, trellis, or other decorative features.
- K. Install weather stripping around and under doors.
- L. Remove combustible materials from underneath, on top of, or within five feet of deck.
- M. Use noncombustible patio furniture.
- N. Cover all eaves with screened vents.
- O. Establish and maintain a five-foot noncombustible buffer around the home.

## Actions to plan and save for

- A. Use noncombustible or ignition resistant siding and trim (e.g., stucco, fiber cement, fire-retardant treated wood) at least two feet up around the base of your home.
- C. Use multi-paned glass for skylights, not materials that can melt (e.g., plexiglass), and use metal flashing.
- D. Install a six-inch vertical noncombustible surface on all gables above roofs.
- F. Install multi-pane windows with at least one tempered-glass pane and metal mesh screens. Use noncombustible materials for window frames.
- G. Install noncombustible gutters, gutter covers, and downspouts.
- H. Install ignition-resistant or noncombustible roofs (composition, metal, or tile).
- I. Install one-hour fire rated garage doors.
- K. Install one-hour fire rated doors.
- L. Use ignition-resistant or noncombustible decking. Enclose crawl spaces.
- N. Use noncombustible eaves.
- P. Replace wooden fences with noncombustible materials and keep fences at least eight feet away from the home. Keep double combustible fences at least 20 feet away from the home.

## Annual Safety Measures and Home Maintenance in the WUI

Reviewing safety protocols, creating defensible space, and hardening your home are not one-time actions, but part of annual home maintenance when living in the WUI. During a wildland fire, homes that have clear defensible space are identified as sites for wildland firefighters to engage in structure protection, and homes that are not safely defensible will not usually receive firefighter resources.

The Colorado State Forest Service provides the following recommendations for annual activities to mitigate risks and increase your wildfire preparedness:

- Check fire extinguishers to ensure they have not expired and are in good working condition.
- Review your family's evacuation plan and practice family fire and evacuation drills.
- Verify that your home telephone number, cell phone, and/or email are properly registered through the NoCo Alert website.
- Review the contents of your "go-bag" and make sure it is packed and ready to go. Visit the Larimer County Emergency Preparedness page to learn about go-bags and evacuation planning, including tips for preparing your pets and livestock for evacuation. Your go-bag should include supplies to last at least three days, including cash, water, clothing, food, first aid, and prescription medicines for your family and pets. Keep important documents and possessions in a known and easily accessible location so you can quickly grab them during an evacuation.
- Pay attention to red flag-day warnings from the National Weather Service and stay vigilant. Ensure your family is ready to go in case of an emergency.
- Walk your property to identify new hazards and ways to maintain and improve current defensible space. Take pictures of your defensible space to help you monitor regrowth and determine when additional vegetation treatments are necessary.
- Clear roofs, decks, and gutters of pine needles and other debris. Remove all pine needles and flammable debris from around the foundation of your home and deck. Remove trash and debris accumulations within 30 feet of your home. Repeat throughout the year as necessary.
- Properly thin and prune trees and shrubs that have regrown in your defensible space Zones 1 and 2 (0-5 feet and 5-30 feet from your home). Remove branches that overhang the roof and chimney. Prune trees and shrubs that are encroaching on the horizontal and vertical clearance of your driveway.
- Mow grass and weeds to a height of four inches or less within 30 feet of your home. If possible, keep your lawn irrigated, particularly within 30 feet of your home. Repeat throughout the year as necessary.
- Check the visibility of your address and remove vegetation that obscures it.
- Check screens over chimneys, eaves, and vents to make sure they are in place and in good condition.
- Ensure that an outdoor water supply is available for responding firefighters. Put a hose and nozzle in a visible location. The hose should be long enough to reach all parts of your home.





## Mitigation Barriers and Opportunities

Homeowners and residents in the WUI share concerns about creating defensible space and maintaining a defensible HIZ. Information in this section is provided by Ember Alliance.

### **I don't know where to start with creating defensible space.**

- Review Figure 3.a.1, and read the CSFS publication Protecting your home from wildfire: Creating wildfire-defensible zones for mitigation recommendations.
- Visit the Colorado State Forest Service for useful information and tips about defensible space creation.
- Reach out to the Colorado State Forest Service or Larimer Conservation District to learn about defensible space and home hardening tactics from their qualified specialists.

### **I don't have the resources to invest in defensible space.**

Creating adequate defensible space can take years and a significant financial investment. Fortunately, there are effective, low-cost measures that residents can start with:

- Annually remove leaves, needles, and other vegetation from roofs, gutters, decks, and around the base of homes.
- Use hand tools like a pole saw to remove tree branches that hang less than 10 feet above the ground.
- Remove combustible materials (dry vegetation, wooden picnic tables, juniper shrubs, etc.) from underneath, on top of, or within five feet of decks.
- Remove vegetation and combustible materials within five feet of windows and doors.
- Replace wood mulch within five feet of all structures with dirt, stone, or gravel.
- Remove downed logs and branches within 30 feet of all structures.
- Apply for cost-sharing grants with your neighbors to subsidize the creation of defensible space (see Section 3.f. Funding Opportunities for Wildfire Hazard Mitigation and Emergency Preparedness).
- Research tax credits that will offset the costs or the work you want to do from the Colorado Department of Revenue.

### **I don't know what to do with slash**

The sticks and other debris left from cutting trees and shrubs is called slash. Slash is a fuel for wildfire, so ensure this debris is properly managed on your property.

- See Section 4.d for a discussion of Slash Management. Recommendations about this are found in Section 3.d
- Poudre Canyon Fire Protection District will help you burn slash piles, they also have heavy duty chippers to chip slash. Contact the Fire Chief for this help.

### **I don't have the resources to invest in home hardening.**

Retrofitting an existing home to be wildfire-resistant can be expensive, particularly actions like replacing flammable roofs and siding. Some of these costs can be divided and prioritized into smaller projects. If you are building a new home, the cost of using wildfire-resistant materials is roughly the same as using traditional building materials (Quarles and Pohl 2018). Wildfire-resistant features often come with additional benefits, such as greater durability and reduced maintenance.



Many home hardening practices are required in Larimer County per building construction regulations effective as of February 2019 for homes within the Wildfire Hazard Area. New construction and expansions adding 50% or more area must comply with the new building standards.

Fortunately, there are effective, low-cost measures that residents can start with to harden their homes:

- Install noncombustible metal gutter covers.
- Cover vent openings with 1/16th- to 1/8th-inch corrosion-resistant metal mesh.
- Cover chimney and stovepipe outlets with 3/8th- to 1/2-inch corrosion-resistant metal mesh to prevent embers from escaping and igniting a fire.
- Caulk and plug gaps greater than 1/16th-inch in siding or around exposed rafters.
- Install weather stripping around and under garage doors to reduce gaps to less than 1/16th-inch.
- Remove combustible materials from underneath, on top of, and within five feet of a deck.
- Replace wood mulch within five feet of all structures with noncombustible products like dirt, stone, or gravel.
- Store all combustible and flammable liquids away from potential ignition sources.
- Keep a fire extinguisher and tools such as a shovel, rake, bucket, and hose available in your garage for fire emergencies.

Suggestions from CAL FIRE's 2020 Low Cost Retrofit List.

### **I am afraid that removing trees will destroy the forest and reduce the aesthetic and monetary value of my property.**

The reality is that nothing will decrease the value of your home as much as a high-severity wildfire burning all the vegetation in the community, even if your home survives the fire.

Look for homes that have followed the guidelines in Figure 3.a.1 and Table 3.a.1. Some properties can have both exemplary defensible space and beautiful landscaping.

Read FireWise Plant Materials from Colorado State University Cooperative Extension and Firescaping from FIRESafe MARIN for suggestions on beautiful, fire-resistant landscaping.

Learn about the ecology of frequent-fire forests along the Colorado Front Range by reading *Back to the future: Building resilience in Colorado Front Range forests using research findings and a new guide for restoration of ponderosa and dry-mixed conifer landscapes* (Miller 2018). Restored ecosystems can be aesthetically pleasing, benefit wildlife and light-loving wildflowers and grasses, and protect your home from high-severity wildfires

Photo by Paula Collins.



## Evacuation Preparedness

Wildfire evacuations have happened before in the PCFPD area. People had to leave their homes during the 2012 High Park Fire and the 2020 Cameron Peak Fire. Since the risk of wildfires is still high in the PCFPD, there may be more evacuations in the future.

To leave quickly and safely during an evacuation, it's important to be prepared. Before there is a wildfire threat, make a go-bag and create a family emergency plan. Talk to your kids and older family members about what they should do. You can visit the Larimer County Emergency Preparedness page to learn about go-bags and evacuation planning. They also have tips for preparing your pets and livestock in case of evacuation. If you sign up for local emergency notifications on the NoCo Alert website, you can get important information right away.

Some people in the PCFPD have family members or neighbors who may have trouble evacuating quickly. Others may live alone and need to think about their own special needs during an evacuation. For example, people with mobility or hearing impairments may need extra help. Parents should also make a plan for their school-aged children who might be home alone during an evacuation. It's important to work with neighbors to come up with a plan.

If you have a livestock trailer or a big camper, you should leave when there's a voluntary evacuation notice. This way, you have time to prepare and it helps make more room on the roads for others when a mandatory evacuation is in effect. It's also a good idea to have a plan for where to take your animals to reduce confusion during evacuations.

### Follow these rules to help everyone in the PCFPD evacuate safely and quickly during a wildfire:

1. Register for Larimer County Emergency Alerts to get evacuation notifications.
2. Leave as soon as possible after getting an evacuation notice.
3. Have a go-bag ready during the wildfire season, especially on days with red flag warnings.
4. Take as few vehicles as possible to reduce traffic and evacuation time.
5. Drive safely, use your headlights, and maintain a steady pace. Don't stop to take pictures.
6. Let emergency vehicles pass.
7. Listen to the directions of law enforcement officers and emergency responders.

**Shelter in place:** There is a hazard in your area, and you should remain or go indoors; you should not go outdoors, and not evacuate the area. This may be the safest strategy for hazardous materials, law enforcement, or other incidents wherein an evacuation could actually increase the danger to you and others.

**Pre-evacuation:** There is a hazard in your area that may require you to evacuate soon. Everyone should be prepared to leave at a moment's notice. If you feel you are in danger and want to leave, do so. If you need additional time to evacuate, you should consider leaving now. If you need to arrange for transportation assistance, you should do so immediately. If you have livestock or other large animals, you should consider removing them from the hazard area now.

**Evacuation:** There is a hazard in your area and you have been ordered to evacuate immediately. If you need assistance evacuating yourself or need help evacuating animals, call 911. You will be provided with the safest escape routes known, so make sure you follow the instructions as other routes may be closed or not passable. You will also be told where an evacuation point has been established to provide information and a safe place if you have nowhere else to go. Do not delay – evacuation means you need to leave immediately!

Photo by Dom Gambone.

## Accessibility and Navigability for Firefighters

Making your home easily accessible and navigable for firefighters is crucial. Here are some important steps you can take:

- 1. Address signs:** Install reflective address numbers that can be easily seen by firefighters, especially at night or in smoky conditions. Reflective signs are affordable and simple to put up. Mount them on noncombustible posts instead of trees, stumps, wooden posts, or chains across driveways. Chains should be removed during wildfires and gates left open, allowing firefighters better access to your property. Ensure the numbers are clearly visible from both directions on the roadway.
- 2. Driveways:** It's essential to make sure emergency responders can locate and reach your home. Firefighters may choose not to defend your home during a wildfire if your driveway has certain issues. These include narrow driveways without turn-arounds, tree limbs hanging over the road, and many dead or fallen trees near the road (Brown, 1994).
- 3. Road conditions:** Some roads in our district have problems with accessibility and navigability. They may be too narrow, lack sufficient vertical clearance for fire engines, or have heavy vegetation on the sides. These unsafe road and driveway conditions will discourage firefighters from attempting to defend homes. According to the National Fire Protection Association, driveways and roads should have a minimum horizontal clearance of 20 feet and a vertical clearance of 13.5 feet to allow fire engines to access them safely (O'Connor, 2021).

## Private Water Resources

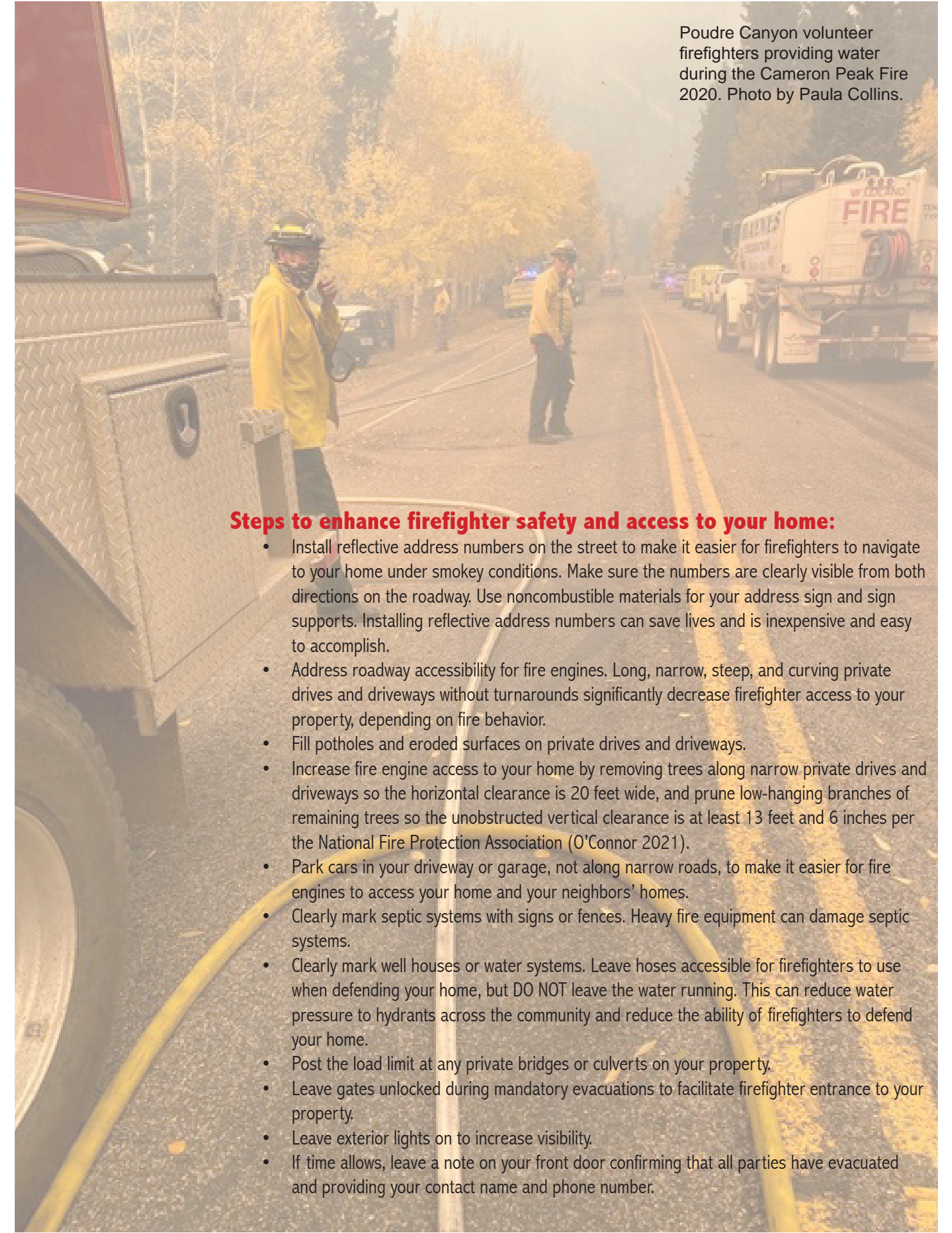
During the fire season in late summer and fall, water resources to fight fires in the foothills can be limited. Firefighters are skilled at using water to protect structures from fires. To help them defend your home, it's important to provide clear access to suitable water resources around your home or neighborhood. If you live along the Poudre River, firefighters can access the river for water by using float pumps.

To prepare your personal water resources, make sure they are easily accessible and clearly labeled. Unlock pump house doors and remove any vegetation or obstructions. If you have a generator, keep it in a place that is easy to reach in case the power goes out. Inform the fire department about the availability of these water resources.

When evacuating, do not turn on sprinklers around your home. This can actually be counterproductive and drain local wells and cisterns before the fire even reaches your neighborhood. It's important to conserve water so that firefighters have enough resources to defend your home. Instead, leave the sprinklers out but turned off, allowing firefighters to decide if they will be useful or not.

The most crucial step is to create defensible space around your home and buildings. Water resources are not reliable in the Colorado foothills and mountains. Maintaining a property that requires less water and resources to defend increases the chances of survival during a fire. You can find guides on defensible space and home hardening recommendations in Figure 3.a.4.





Poudre Canyon volunteer firefighters providing water during the Cameron Peak Fire 2020. Photo by Paula Collins.

### **Steps to enhance firefighter safety and access to your home:**

- Install reflective address numbers on the street to make it easier for firefighters to navigate to your home under smokey conditions. Make sure the numbers are clearly visible from both directions on the roadway. Use noncombustible materials for your address sign and sign supports. Installing reflective address numbers can save lives and is inexpensive and easy to accomplish.
- Address roadway accessibility for fire engines. Long, narrow, steep, and curving private drives and driveways without turnarounds significantly decrease firefighter access to your property, depending on fire behavior.
- Fill potholes and eroded surfaces on private drives and driveways.
- Increase fire engine access to your home by removing trees along narrow private drives and driveways so the horizontal clearance is 20 feet wide, and prune low-hanging branches of remaining trees so the unobstructed vertical clearance is at least 13 feet and 6 inches per the National Fire Protection Association (O'Connor 2021).
- Park cars in your driveway or garage, not along narrow roads, to make it easier for fire engines to access your home and your neighbors' homes.
- Clearly mark septic systems with signs or fences. Heavy fire equipment can damage septic systems.
- Clearly mark well houses or water systems. Leave hoses accessible for firefighters to use when defending your home, but DO NOT leave the water running. This can reduce water pressure to hydrants across the community and reduce the ability of firefighters to defend your home.
- Post the load limit at any private bridges or culverts on your property.
- Leave gates unlocked during mandatory evacuations to facilitate firefighter entrance to your property.
- Leave exterior lights on to increase visibility.
- If time allows, leave a note on your front door confirming that all parties have evacuated and providing your contact name and phone number.

### **3.b. Neighborhood Recommendations**

See Section 3.a Individual Recommendations to learn about practices for creating defensible space, and for next steps to inspire collective action across your community.

#### **Linked Defensible Space**

During wildfires, homes can catch fire because of embers. Research after the 2018 Camp Fire showed that homes were more likely to burn down if they were close to other structures or had vegetation within about 330 feet of the home (Knapp et al. 2021).

In the PCFPD area, residents are concerned about the possibility of neighboring properties and surrounding forest service land catching fire and spreading to their own property. Since your home's ignition zone likely overlaps with your neighbor's property, it is vital for residents across the PCFPD to create defensible space and make their homes more resistant to fires. If everyone takes steps to mitigate fire risks, the impact of individual defensible space projects will improve. Defensible space projects that cover multiple properties are more likely to receive grant funding individual defensible space projects will improve.

#### **Mosaic Landscapes**

Creating a mosaic landscape in neighborhoods can help slow down the spread of fires. Historical forest conditions show that varied fuel types and heterogeneous landscapes are effective in slowing fire spread. A mosaic landscape consists of different fuel types and trees of varying sizes and ages. For example, a neighborhood can have a combination of old growth conifer trees, aspen stands, young regenerating conifer trees, and grassy meadows. This diverse arrangement not only helps in fire prevention but also enhances the aesthetic appeal of the area, resembling a patchwork quilt or mosaic art.

#### **Accessibility and Navigability for Firefighters Shared Driveways and Community Roads**

We need to make sure emergency responders can find and reach every home in our neighborhood. Narrow roads without turnarounds, tree limbs hanging over the road, and fallen trees can make it difficult for firefighters to defend homes during a wildfire.

We can work together as a neighborhood to improve road safety. Widening shared driveways and private roads can be expensive and time-consuming, but if neighbors collaborate and apply for grants, we can make our homes safer. Driveways and roads should have enough clearance for fire engines to pass through, at least 20 feet horizontally and 13.5 feet vertically (O'Connor, 2021).

We can take simple steps like installing reflective address numbers and clearing trees along driveways to improve accessibility. Working together to update signs and improve road construction can also help reduce costs for everyone involved.

#### **Conclusion:**

By implementing linked defensible space, creating mosaic landscapes, and improving accessibility for firefighters, residents can significantly reduce the risk of property loss during wildfires. These measures not only enhance personal safety but also contribute to the well-being of the entire neighborhood. Remember, working together and taking proactive steps can make a difference in safeguarding homes and lives.



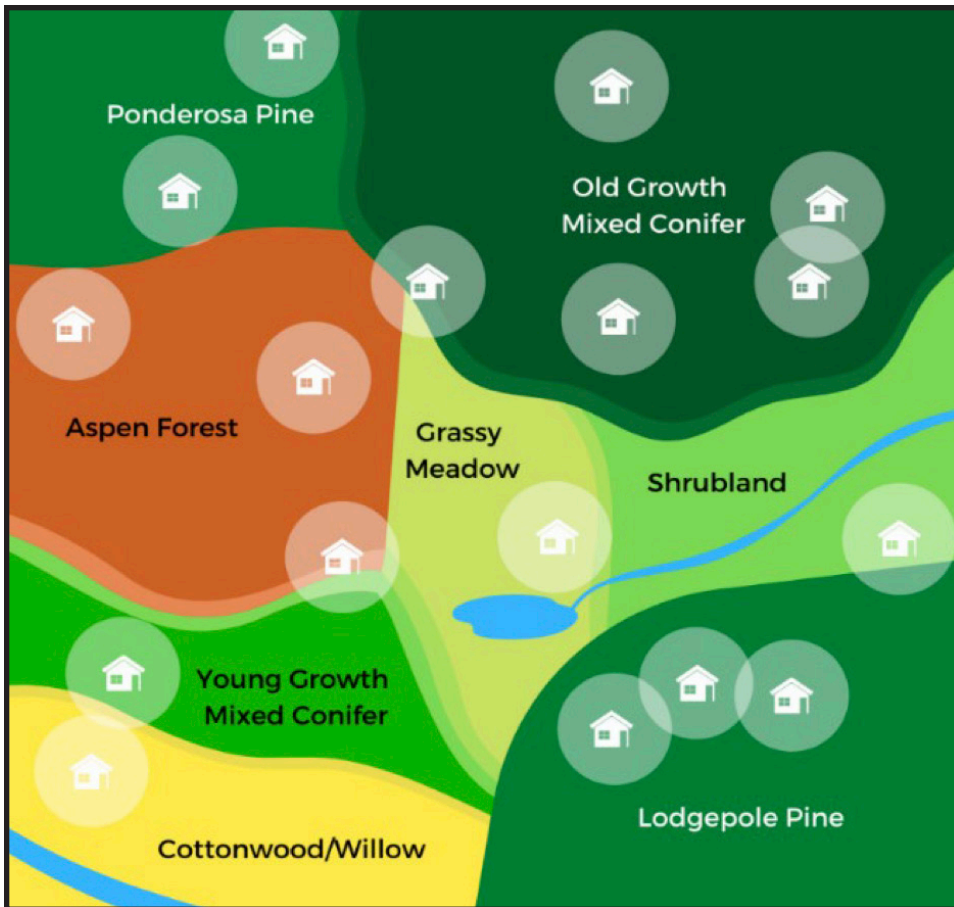


Figure 3.b.1. Example of a mosaic landscape in a neighborhood. Each home has defensible space around it, and the landscape is varied throughout, providing tactical opportunities for firefighters working to defend homes. Graphic by Ember Alliance.

### 3.c. Priority Plan Unit Recommendations

### CWPP Plan Units

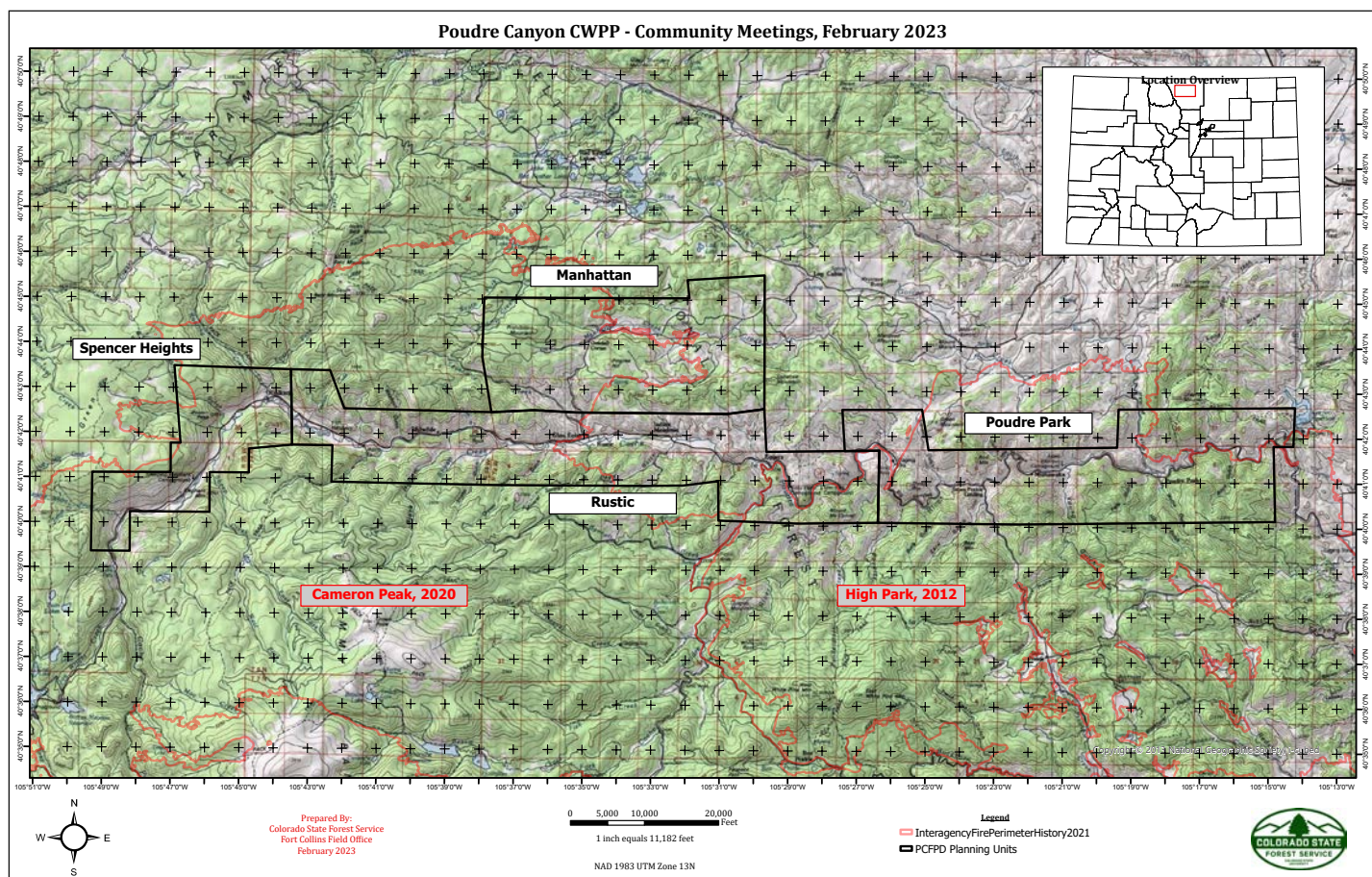
PCFPD has set up four plan units for the district: Poudre Park, Rustic, Spencer Heights and Manhattan Creek which are areas with shared fire risk where residents can organize and support each other to effectively mitigate hazardous fuels.

Residents within CWPP plan units will be able to discuss shared risk and organize joint efforts to reduce risk and enhance emergency preparedness. The CWPP is a useful planning document, but it will only affect real change if residents, neighbors, and the entire community come together to address shared risk and implement strategic projects.

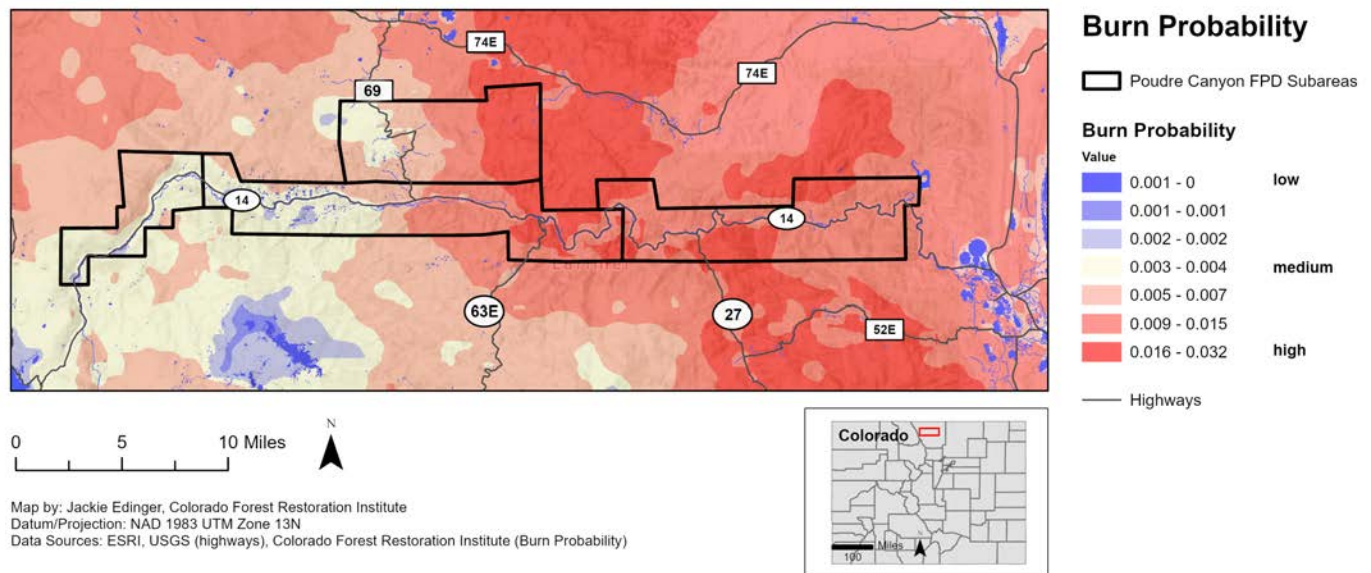
### Relative Hazard Ratings

To prioritize action, Colorado CWPPs must include a relative rating of hazards within the Fire Protection District. Some of the district's planning units have a higher relative risk and thus need immediate action to mitigate hazardous conditions. Planning units with lower relative risk still have conditions that need work for the protection of life and property in the case of a wildfire.

Figure 3.c.1 CWPP planning units: Poudre Park, Rustic, Spencer Heights and Manhattan Creek.





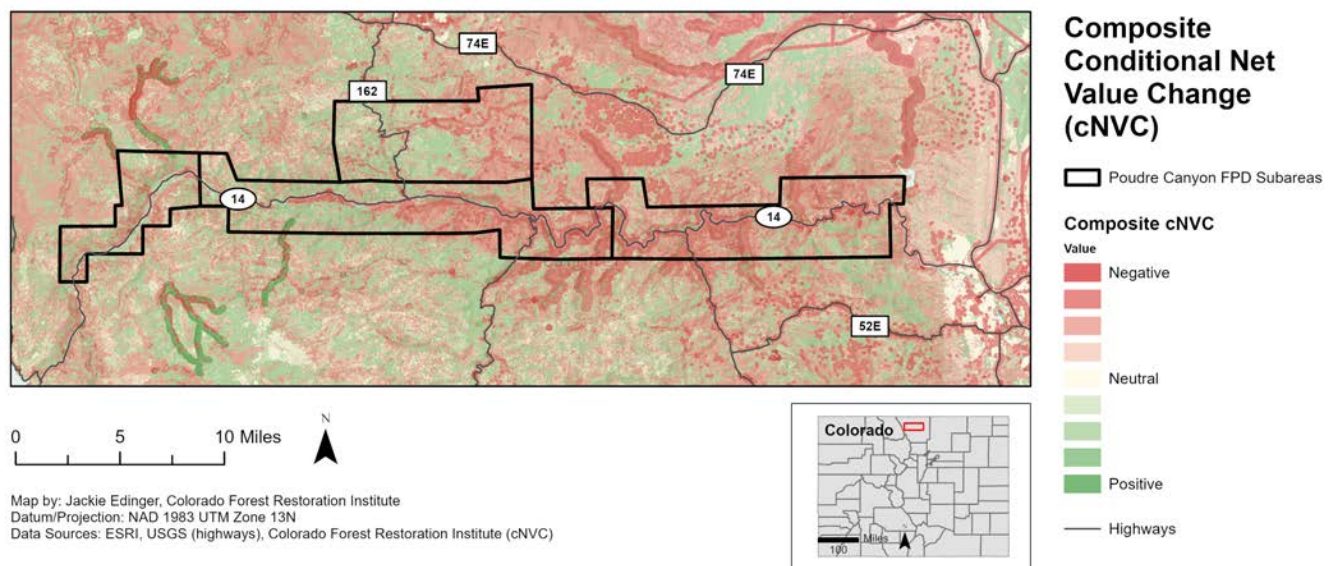


The burn probability map shows that area of the Cameron Peak fire in 2020 is moderate to low risk of burning while the area of the High Park Fire in 2012 shows much higher probability to burn. It should be noted that both the High Park Fire and the Cameron Peak Fire started outside of the PCFPD borders and spread into the district. So the high probability areas surrounding the district are of great concern. Burn probability is the probability that a wildfire will burn a given point or area during a specified period of time. Burn probability for wildfire management planning applications is often reported on an annual basis—the probability of burning at any time during a single calendar year. For practical purposes, wildfire simulation systems treat the burning of each pixel, the smallest landscape unit, as a point.

Figure 3.c.2 The FSim burn probability product used for the QWRA analysis extent.

[Publication on QWRA.](#)

**FYI - On these maps, red is bad, green is good.**



Conditional net value change (cNVC) represents susceptibility of all high value resource or assets (HVRAs) to wildfire, assuming everywhere on the landscape has an equal chance of burning. cNVC highlights where fire-sensitive HVRAs overlap with hazardous fuel conditions. cNVC is particularly relevant during active wildfire incidents when burn probability is no longer determined by historical occurrence trends.

Figure 3.c.3 Composite conditional net value change (cNVC) map for the analysis extent. Negative cNVC means net losses. Positive cNVC means net benefits. This product does not account for burn probability.

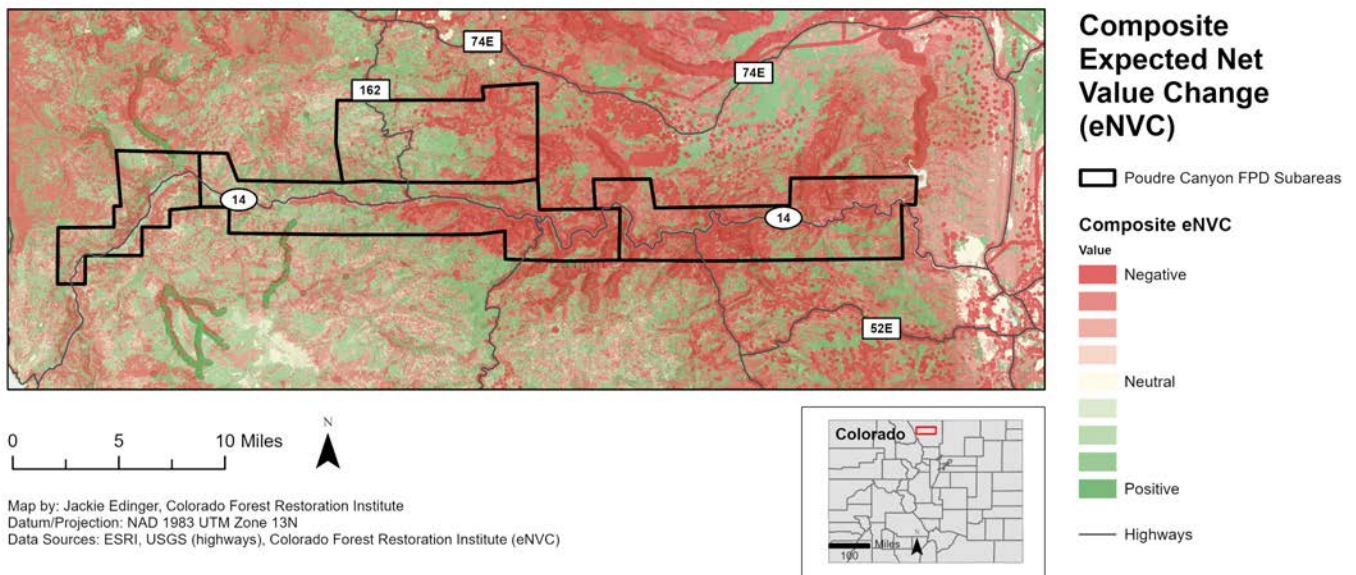


Figure 3.c.4  
 Negative means high risk, positive means benefit from fire.

Expected net value change (eNVC) represents the risk of all HVRAs to wildfire while accounting for spatially variable burn probability. eNVC highlights where fire-sensitive HVRAs that overlap with hazardous fuel conditions are most likely to burn. eNVC is particularly relevant for fuels treatment planning to place treatments in locations where they are likely to encounter wildfire.  
 $cNVC * \text{burn probability} = eNVC$ .

Composite wildfire risk map for the analysis extent. Negative eNVC means high risk. Positive eNVC means there is an expected benefit from fire. eNVC measures account for both the HVRA susceptibility and probability of wildfire.

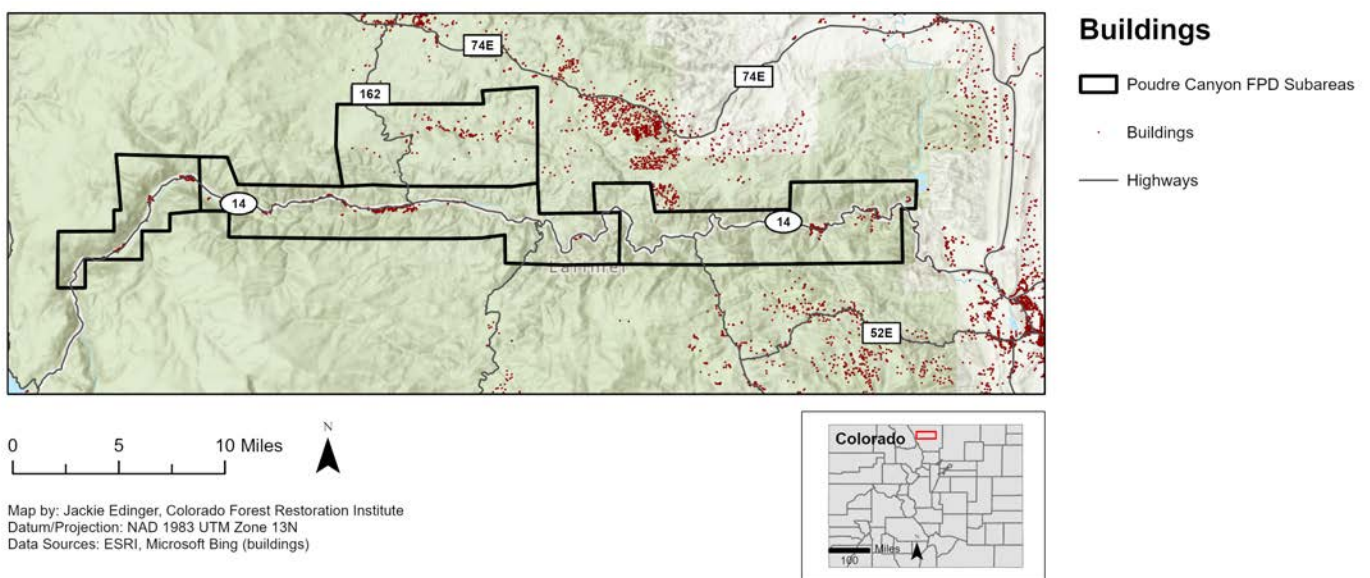


Figure 3.c.5 Building centroids converted from building footprint polygons from Microsoft Bing.

Building centroids converted from building footprint polygons from Microsoft Bing shows homes and businesses in PCFPD.



Table 3.c.1 This table focuses on priority actions for each plan unit. It should be noted that homeowners can benefit from all actions outlined in **Section 3. Individual Recommendation** and **Section 3.b. Neighborhood Recommendations**.

| <b>Table 3.c.1<br/>Unit</b> | <b>Unit Description</b>  | <b>Priority Mitigation Suggestion</b>   |
|-----------------------------|--|---|
| Poudre Park                 | Most of the homes in this area were built in the last century. It is in Lower Montane and consists mostly of ponderosa pine. Interspersed amongst the pine are fire-flashy Rocky Mountain juniper trees. Other trees in the area consist of blue spruce, Engelmann spruce, aspen. The river's edge is predominately populated with cottonwood and willow. At this elevation there is still a fair amount of highly combustible sage brush, chokecherry, and currant bushes. Area was impacted by High Park Fire in 2012. | <ul style="list-style-type: none"> <li>• Encourage residents to harden their homes</li> <li>• Mow tall grasses, remove shrubs in home ignition zone, and remove pine needles from roofs and gutters</li> <li>• Move wood piles and propane tanks 30 ft from homes</li> <li>• Widen roads to accommodate larger vehicles</li> <li>• Mark bridges for weight limits</li> <li>• Install visible, readable address signage</li> </ul>   |
| Rustic                      | Most homes in this area were built in the last century but they have more space between them than Poudre Parks's community. It has Lower Montane vegetation. USFS did prescribed burns on south facing slopes north of Hwy 14 in 2019. The Rustic area was impacted by the Cameron Peak Fire in 2020.  | <ul style="list-style-type: none"> <li>• Encourage residents to harden their homes</li> <li>• Mow tall grasses, remove shrubs in home ignition zone, and remove pine needles from roofs and gutters</li> <li>• Move wood piles and propane tanks 30 ft from homes</li> <li>• Widen roads to accommodate larger vehicles</li> <li>• Mark bridges for weight limits</li> <li>• Install visible, readable address signage</li> </ul>   |
| Spencer Heights             | Vegetation is mostly of ponderosa pine in the lower elevations and lodgepole pines in the higher elevations. Large grass meadows line the river and Hwy 14. It is sparsely populated, with only two visitor orientated businesses. The Cameron Peak Fire surrounded this area on both the north and south sides of the highway. Structures were built last century.  | <ul style="list-style-type: none"> <li>• Encourage residents to harden their homes and businesses</li> <li>• Mow tall grasses, remove shrubs in home ignition zone, and remove pine needles from roofs and gutters</li> <li>• Move wood piles and propane tanks 30 ft from homes</li> <li>• Widen roads to accommodate larger vehicles</li> <li>• Mark bridges for weight limits</li> <li>• Install visible, readable address signage</li> </ul>  |
| Manhattan Creek             | This area is home to two not-for-profits who are large landowners: Drala Mountain Center and Ben Delatour Scout Ranch. Vegetation is mostly ponderosa pine interspersed with grass meadows. There are many 35 acre lots in this area and along the road are 5 acre lots with homes. The Cameron Peak Fire reached this area.   | <ul style="list-style-type: none"> <li>• Encourage residents to harden their homes and businesses</li> <li>• Mow tall grasses, remove shrubs in home ignition zone, and remove pine needles from roofs and gutters</li> <li>• Move wood piles and propane tanks 30 ft from homes</li> <li>• Widen roads to accommodate larger vehicles</li> <li>• Mark bridges for weight limits</li> <li>• Encourage residents to thin their forests</li> <li>• Install visible, readable address signage</li> </ul> |

Table 3.c.2 Resources for suggested mitigation. Source Ember Alliance.

| Suggestion   | Goal  | Resource   |
|--|---|--|
| Home hardening   | Make the home less flammable by using noncombustible materials and clearing combustibles away from home   | See: Home Hardening  |
| Defensible space   | Clear combustible materials way from the home, reduce fire activity and severity as it approaches the home.   | See: Defensible Space  |
| Create linked defensible space                               | Overlapping HIZ's create more opportunity for homes to ignite. Work with neighbors to reduce fire activity and severity near all homes to protect them all.               | See: Defensible Space; Linked Defensible Space   |
| Remove flammable material from the HIZ                       | Clear combustible materials such as firewood, propane tanks and wooden lawn furniture away from the home.   | See: Defensible Space  |
| Mow grass and clear bushes away from the home                | Clear combustible vegetation such as tall grass, bushes, and all junipers way from near the home.   | See: Defensible Space  |
| Have evacuation plans and go-bags ready                      | When there is significant danger to both life and property in PCFPD, residents need to be prepared to leave at any time and not rely on the fire department to save them. | See: Evacuation Preparedness   |
| Roadside mitigation  | Clear vegetation from around the road to improve access and decrease the amount of fuels that could burn across a roadway while residents are evacuating.                 | See: Driveways; Roadway Fuel Treatment Recommendations                                       |
| Road improvements for accessibility and safety               | Create a road network that fire engines can safely access and is less likely to trap residents during an evacuation.  | See: Accessibility and Navigability for Firefighters; roadway Fuel Treatment Recommendations |
| Install reflective signage for navigation                    | Make it easier for firefighters to find a home or neighborhood to assist in property defense and evacuations. It can be very difficult to see during major fire events.   | See: Accessibility and Navigability for Firefighters   |
| Landscape-scale mitigation work across the community         | Treat forests to prevent intense fire behavior near homes and increase landscape resilience by restoring historical conditions.   | See: Stand-Level Fuel Treatment Recommendations  |
| Community work to create roadside fuel treatments            | Treat forest to prevent intense fire behavior near homes and increase landscape resilience by restoring historical conditions.  | See: Stand-Level Fuel Treatment Recommendations; Roadway Fuel Treatment Recommendations      |
| Ladder fuel treatment  | Prevent fire from moving from the ground to the tree canopy, which will reduce fire intensity and speed.  | See: Stand-Level Fuel Treatment Recommendations  |
| Maintain and continue stand-level fuel treatments near homes | Treat forests to prevent intense fire behavior near homes and increase landscape resilience. Treatments must be maintained to continue to provide defense to homes.       | See: Stand-Level Fuel Treatment Recommendations  |
| Mark weight limit on bridges                                 | Work with the county engineer to determine weight limits on any bridge used to access home. Post these weights on the bridge.   | See: Accessibility and Navigability for Firefighters   |
|  |   |  |



## Slash Management Recommendations

For many years the PCFPD has been assisting homeowners in burning their slash piles in the winter. In 2021/22 there wasn't enough snow to burn piles. PCFPD received a grant to obtain an additional six-inch chipper. Thus, the district now has a chipper in both the upper and lower Poudre Canyon and the district assists homeowners in chipping their slash.

The [Colorado Division of Fire Prevention and Control](#) (DFPC) offers training for residents who want to burn slash piles. It is suggested that residents who want to burn take this training. This will ensure those persons burning piles are prepared for the risks of pile burning. DFPC's description of this program: "By training and certifying private entities to plan and implement prescribed fire in a more systematic and educated manner, similar to that required by policy for natural resource and fire management agencies at, all levels of government, the end result would be to promote the relatively safe and efficient use of fire as a management tool regardless of land ownership. The program is also designed to provide some level of civil liability protection for those trained and certified entities." It should be noted that residents taking this course earn some legal protections.

Larimer County Sheriff Office also has some resources for residents to provide guidance about wildfire mitigation. However, this program has limited capacity. Through the development of CWPPs, it has been identified that Poudre Canyon Fire Protection District partner with Red Feather, Crystal Lakes, Livermore and Glacier View fire districts to support a paid position that creates additional capacity for all these locations/departments and can bring forward some of the recommendations in Section 3.e about outreach and education and to help residents implement the Plan Unit Recommendations in Section 3.c. Managing slash at this regional level could also be a great benefit to all communities to encourage and support wildfire mitigation projects by residents.

PCFPD volunteers helping a resident chip slash. Photo by Hugh Collins.

## 3.d. District-Wide Recommendations



## Evacuation Planning and Capacity

Residents in the PCFPD have been evacuated many times. Some residents were evacuated during the 2012 High Park Fire, and others during the 2020 Cameron Peak Fire. Because the area is at high risk for wildfires and floods, more evacuations are likely in the future. That's why it's important for the community to get ready for emergencies.

Technology can help residents feel confident about evacuating during a wildfire. The Larimer Emergency Telephone Authority, LETA-911, uses a system called NoCo Alert, also known as reverse 911, to give evacuation orders to residents. If you have a landline, it's automatically registered. But if you use a phone that uses the internet, like VoIP, you need to register your cell phone and email on the NoCo Alert website. Make sure to tell your neighbors about NoCo Alert if they don't know about it.

Here are some steps to consider:

1. Clear trees, cut low branches, and mow grass along roads to make it safer during a wildfire. Start with the busiest and most crowded roads, and then move to the less crowded ones.
2. Work with the Larimer County Sheriff's Office to practice evacuation drills for the entire PCFPD. This will help everyone learn how to evacuate safely and effectively.
3. Work with LETA-911 to get more people in the PCFPD to use NoCo Alert. Test the system regularly to make sure it can send timely and accurate information during an evacuation.
4. Teach residents about warning systems, evacuation protocols, and how to evacuate properly before a real emergency happens. It's important to follow evacuation orders. If you don't leave on time during a wildfire, it can put first responders at risk.
5. Encourage households to leave with only one vehicle to reduce traffic congestion for everyone.
6. Help every household create a family evacuation plan and pack "go-bags" that are ready to take with them. Work with neighbors to develop a plan for helping each other if someone is not at home, if there are kids or pets at home alone, or if someone needs special assistance due to mobility impairments. Review the contents of your go-bag and make sure it's packed and ready. You can visit the Larimer County Emergency Preparedness page to learn more about go-bags and evacuation planning, including tips for preparing your pets and livestock for evacuation.
7. Encourage residents to evacuate if they feel unsafe, even before they receive mandatory evacuation orders. Everyone should leave promptly when a mandatory evacuation order is given. This means you should already have a family emergency plan in place and have your go-bags ready.
8. Make sure that warnings and alerts can be understood by everyone, including those who speak English as a second language or have hearing impairments.





## Community Self-Organization

PCFPD should continue to engage with community members using a variety of methods, including emails, newsletters, website, social media, and education materials. The recommendations in this plan should be shared with residents. It is the intention of this project that ideas and guidance be compiled in this document so it can be easily referenced and shared. As described in Section 3.d, a shared position among local fire districts is a recommended method to carry forward these recommendations and provide capacity for outreach and education.

As each community makes progress on the top-priority actions outlined below, refer to the fire adapted communities' "wheel" (Figure 3.1) and seek additional ideas and resources from the [Fire Adapted Community Learning Network](#) and [Fire Adapted Colorado](#) (FACO). Visit their websites for more information on their programs and upcoming events.

## 3.e. Outreach and Education



Table 3.e.1. Next steps that residents can take to gain traction and inspire action to reduce wildfire risk across their community. Many of these suggestions come from fire adapted communities neighborhood ambassador approach: Increasing preparedness through volunteers (Wildfire Adapted Partnership 2018).

|  |   |
|--|---|
| <p>Increase support for wildfire risk mitigation across the community.</p>   | <p>Volunteer to be a community organizer and leader around wildfire risk mitigation and emergency preparedness. Contact your neighbors and form new working groups focused on wildfire education and risk reduction.</p> <p>Invite your neighbors over for a friendly conversation about the risk assessment in this CWPP. Review resources about defensible space together, discuss each other's concerns and values, and develop joint solutions to address shared risk.</p> <p>Contact the Colorado State Forest Service for publications and other educational material to learn about wildfire risk mitigation and share these resources with your neighbors.</p> <p>Organize walking tours to visit the property of residents with exemplary defensible space. Witnessing the type of work that can be done, and seeing that a mitigated property can still be aesthetically pleasing, can encourage others to follow suit.</p> |
| <p>Reduce barriers to wildfire risk mitigation wildfire.</p>   | <p>Advocate with other public leaders such as Larimer County Commissioners and state legislators for regional approaches to slash management.</p> <p>Take the Certified Burner B course from the Colorado Division of Fire Prevention and Control so you can safely implement pile burns on your property (where allowed by local regulations).</p>   |
| <p>Create safer conditions along driveways and roadways to protect residents during evacuations and firefighters during suppression operations and structure defense. Narrow roads without turnarounds, tree limbs hanging over the road, and lots of dead and down trees by the road can create non-survivable conditions along roads during a wildfire and prevent access to and from your neighborhood.</p>   | <p>Work with neighbors to identify roads and driveways with potentially non-survivable conditions using insights from the CWPP (see Priority Locations).</p> <p>Contact the Larimer County Road and Bridge Department to determine who owns rights-of-way along roadways and to discuss opportunities for mitigation projects.</p> <p>Develop a joint proposal for wildfire mitigation grants with your neighbors (see Section 3.f. Funding Opportunities for Wildfire Hazard Mitigation and Emergency Preparedness).</p> <p>Contact the Coalition for the Poudre River Watershed, Larimer Conservation District, Larimer County Conservation District, or Colorado State Forest Service to discuss your plans for mitigating wildfire risk along roadways.</p>   |
| <p>Create linked defensible space to reduce wildfire risk to entire neighborhoods. Collective action by residents will magnify the impact of individual defensible space projects, create tactical opportunities for wildland firefighters, and reduce the likelihood that homes will ignite due to embers produced from adjacent, combusting homes. Linked defensible space has greater strategic value, and projects that span ownership boundaries are better candidates for grant funding.</p> | <p>Start reducing risks on your own property by following recommendations outlined in Section 3.a Individual Recommendations.</p> <p>Work with your neighborhood working group to identify individuals willing to conduct mitigation work on their property.</p> <p>Use information from this CWPP to determine areas of high-risk in your community (see priority locations in Priority Plan Unit Recommendations and Priority Treatment Locations).</p> <p>Develop a joint proposal for wildfire mitigation grants with your neighbors (see Section 3.f. Funding Opportunities for Wildfire Hazard Mitigation and Emergency Preparedness).</p> <p>Contact the Coalition for the Poudre River Watershed, Larimer Conservation District, Larimer County Conservation District, or Colorado State Forest Service to discuss your plans for creating linked defensible space and to ask for guidance and available resources.</p>       |
|  |   |





Ninety-five percent of the cost of PCFPD's Big Red came from a FEMA grant.

### 3.f. Funding Opportunities for Wildfire Hazard Mitigation and Emergency Preparedness

List compiled by Ember Alliance.

### Opportunities from Local and State Agencies in Colorado

- The Colorado State Forest Service (CSFS) [Forest Restoration and Wildfire Risk Mitigation](#) (FRWRM) is a competitive grant program designed to assist with funding community-level actions across the entire state to: reduce the risk to people, property and infrastructure from wildfire in the wildland-urban interface; promote forest health and the utilization of woody material including for traditional forest products and biomass energy; and encourage forest restoration projects. Eligible applicants include local community groups, local government entities such as fire protection districts, public and private utilities, state agencies, and non-profit groups.
- CSFS administers programs for landowner and community assistance, including the [Colorado Forest Ag Program](#) and [Colorado Tree Farm Program](#).
- CSFS regularly updates their [Natural Resources Grants and Assistance Database](#) to help residents, agencies, and other partners find funding for natural resource projects.
- The [Colorado Department of Revenue provides a Wildfire Mitigation Measures Subtraction](#) whereby individuals, estates, and trusts may claim a subtraction on their Colorado income tax return for certain costs incurred in performing wildfire mitigation measures on property in the WUI.
- The [Larimer County Office of Emergency Management](#) offers community mitigation grants to increase a community's long-term resilience to natural hazards.

### Funding from the Federal Government Federal Emergency Management Agency (FEMA)

- [Building Resilient Infrastructure and Communities](#) (BRIC) grant program supports states, local communities, Tribes, and territories as they undertake large-scale projects to reduce or eliminate risk and damage from future natural hazards. Homeowners, business operators, and non-profit organizations cannot apply directly to FEMA, but they can be included in sub-applications submitted by an eligible sub-applicant (local governments, Tribal governments, and state agencies).
- [Hazard Mitigation Assistance Grants Program](#) (HMGP) provides funding to state, local, Tribal, and territorial governments so they can rebuild in a way that reduces, or mitigates, future disaster losses in their communities. This grant funding is available after a presidentially declared disaster.
- [Assistance to Firefighters Grants](#) (AFG) help firefighters and other first responders obtain critical resources necessary for protecting the public and emergency personnel from fire and related hazards.
- [Fire Prevention & Safety \(FP&S\) Grants](#) support projects that enhance the safety of the public and firefighters from fire and related hazards.
- [Staffing for Adequate Fire and Emergency Response \(SAFER\)](#) grants directly fund fire departments and volunteer firefighter organizations to help increase their capacity.

### The Natural Resources Conservation Service (NRCS) offers the Environmental Quality Incentives Program (EQIP)

which provides cost-share opportunities for landowners or managers, typically on private land. Eligible applicants can work through their local NRCS Field Office to create a Conservation Plan and apply for the program. Though EQIP does not require matching



contributions, it typically covers only 50-75% of associated costs for a forestry project. This program is tied to addressing Resource Concerns on working lands, not limited to forestry. The Larimer Conservation District (LCD) partners with NRCS to administer this program locally on forested land with eligible and interested landowners within Larimer County, and can leverage EQIP funding to apply for grants to cover any additional costs.

For more information on EQIP, visit: <https://www.nrcs.usda.gov/programs-initiatives/eqip-environmental-quality-incentives>

To contact LCD: [www.larimercd.org](http://www.larimercd.org)

## Opportunities from Non-Governmental Organizations

- [Coalitions and Collaboratives, Inc.](#) manages the Action, Implementation, and Mitigation Program (AIM) to increase local capacity and support wildfire risk reduction activities in high-risk communities. AIM provides direct support to place-based wildfire mitigation organizations with pass-through grant funding, on-site engagement, technical expertise, mentoring, and training on mitigation practices to help high-risk communities achieve their wildfire adaptation goals.
- [Coalition for the Poudre River Watershed](#) (CPRW) can aid with small-acreage wildfire mitigation projects on private property. Reach out to the CPRW Forester, Daniel Bowker, for more information.
- [Fire Adapted Colorado](#) (FACO) manages the [FACO Opportunity Fund](#), which is a matching mini-grant program to support projects, build capacity, and address local needs with funding from the National Fire Adapted Communities Learning Network.

## Supporting the Fire Protection District

PCFPD strives to be supportive of forestry projects that improve forest health and wildfire safety. Creating, managing, and implementing fuels mitigation projects takes time and effort that is often unfunded to the district. Education and outreach are incredibly important to the district – connecting with their constituents is a vital part of building relationships and providing the highest quality services. This work requires time and resources that the PCFPD does not always have to spare.

Community support is also vital to the success of the fire stations:

- PCFPD is supported by volunteer responders who respond to fires, medical emergencies, and rescues every day of the year. Learn more about how you can volunteer by contacting your local fire department. Each station has a captain who can answer questions and explain procedures.
- Financial support in the form of monetary donations or support of local ballot measures that provide tax revenue for the PCFPD is vital to their success in responding to residents in their time of need.
- Attend events hosted by the PCFPD. Seeking out information to protect your home from fire danger can also help protect your local firefighters. Sharing this information within your community can build community resilience and can help lower implementation costs for individual homeowners for many projects.

## **4. Implementation Recommendations for Fuel Treatments**

### **4.a. General Objectives and Implementation of Fuel Treatments**

Fuel treatments are an important tool in land management for reducing the risk of wildfires. They work by decreasing the amount and changing the distribution of wild-land fuels, thereby minimizing the potential for destructive crown fires and lowering fire intensity. Achieving these objectives involves various measures, such as the removal of trees, increasing the spacing between tree crowns, clearing small trees, shrubs, and low branches to create greater distance between surface fuels and tree crowns, and eliminating downed trees and other dead vegetation (Agee and Skinner, 2005). Fuel treatment methods include tree thinning, pruning, pile burning, broadcast prescribed burning, and fuel mastication.

Strategically located and well-executed fuel treatments can offer tactical advantages for fire suppression efforts. By implementing fuel treatments along trails, ridgelines, and other features, firefighters gain opportunities to utilize direct or indirect suppression techniques, which can help contain the spread of fires. A notable example of this occurred during the Cameron Peak Fire. In 2019, a prescribed burn was conducted on the south-facing slopes along Highway 14 with the intention of enhancing habitat for wild sheep. When the Cameron Peak fire approached the town of Rustic, the previously treated area slowed down the growth of the large fire. Consequently, the fire department was able to extinguish the smaller fires caused by embers in Rustic.

It is important to note that not all fuel treatments are created equal, and there is no one-size-fits-all approach to fuel treatment design (Reinhardt and others, 2008). The recommendations for fuel treatments depend on several factors, including the forest type, tree density, fuel loads, terrain characteristics, land use, and management objectives. Treatments within defensible space zones, which are areas surrounding structures where wildfire risk reduction is a priority, tend to be more intensive compared to treatments outside of these zones. Along roadways, the removal of numerous trees may be necessary to ensure safe conditions, especially along Highway 14, which serves as an evacuation route for residents of the PCFPD and other areas. In larger forested areas, fuel treatment strategies can align with principles of ecological restoration, which involves assisting in the recovery of ecosystems that have been damaged, degraded, or destroyed (SER, 2004). Many forests in the western United States have been adversely affected due to changes in historical fire patterns following Euro-American colonization.

In certain cases, fuel treatments can serve both ecological and wildfire risk reduction objectives. For instance, restoration treatments in dry-mixed conifer and ponderosa pine forests can effectively achieve both fuel treatment and ecological restoration goals. On the other hand, treatments that result in widely spaced trees may effectively reduce fuel loads but may not adequately address ecological objectives in most forest types.

While homeowners are responsible for implementing fuel mitigation measures on their own lands, they do not have to undertake the task alone. Assistance and guidance can be obtained from organizations such as the Larimer Conservation District, Colorado State Forest Service, or other wildfire mitigation specialists, who can provide valuable support in planning and implementing fuel treatments tailored to specific needs and objectives.



## **Treatment Categories**

### **1. Home Ignition Zone Mitigation**

The goal of Home Ignition Zone (HIZ) mitigation is to reduce the vulnerability of structures, such as homes, to ignition during wildfires. This involves making homes more resistant to catching fire from embers or radiant heat. It also includes creating defensible space by treating the vegetation and fuels around homes to lower the intensity of fire activity as it approaches. Recommendations for HIZ mitigation are standardized and outlined in this document, as well as publications from the Colorado State Forest Service. Individual homeowners and neighborhoods can work on HIZ mitigation with assistance from the PCFPD.

### **2. Stand-level fuel treatments:**

Stand-level fuel treatments focus on reducing surface fuels, decreasing tree density, and increasing the distance between surface and canopy fuels within forest stands. These treatments aim to minimize the risk of intense crown fires. Ideally, stand-level fuel treatments follow ecological restoration principles and achieve both ecological and fuel reduction objectives. However, it's important to note that not all fuel treatments restore ecosystems. For instance, a forest with evenly spaced trees can effectively serve as a fuel treatment but may not meet ecological objectives in most forest types. Stand-level fuel treatments are typically implemented by large landowners, public land managers, and collaborating neighborhoods.

### **3. Roadway fuel treatments:**

Roadway fuel treatments involve creating buffers along roadsides with reduced fuel loads. The purpose is to enhance fire control opportunities and minimize the chances of non-survivable conditions developing during a wildfire. Removing trees along narrow roadways also improves access for fire engines and provides safer routes for firefighters. Fuel treatments along trails, ridgelines, and other features can aid firefighters in containing the spread of fires. All collaborators in the district can contribute to this work. Individuals can also implement these recommendations along their driveways and coordinate with local authorities to mitigate hazards along roadways in their communities.

## **Treatment Costs**

The cost of fuel treatments varies depending on factors such as management objectives, treatment specifications, slope, accessibility, and method of treatment (e.g., mechanical thinning, hand thinning, or prescribed burning). Costs typically range from \$2,500 to \$10,000 per acre along the Colorado Front Range, where there is limited biomass or timber industry for financial returns. Steeper slopes and greater distances from roads may result in higher costs. Follow-up treatments generally have lower costs and help maintain the effectiveness of initial investments in fuel treatments. The costs involved emphasize the importance of strategic, well-designed, landscape-scale treatments to increase the likelihood of moderating fire behavior.

## **Benefits of Fuel Treatment**

Fuel treatments offer various benefits, including saving lives, protecting ecosystems, and providing economic returns. They reduce property damages by making wildfires less destructive and easier to control, particularly prescribed burning, which is often more cost-effective in altering forest fuel loads compared to mechanical thinning alone. Fuel

treatments also decrease the costs of rehabilitating water sources after wildfires, which can lead to significant erosion during subsequent storm events. In some cases, fuel treatments can lower suppression costs by enhancing firefighting efficiency.

## **Considerations and Conclusion**

Although not all fuel treatments result in positive financial returns, they still offer ecological benefits when aligned with the principles of ecological restoration. Some treatments may never encounter wildfires, and their effectiveness can be limited during severe fire weather conditions. Suppression expenditures are often influenced by values at risk, fire size, and land ownership, rather than fuel characteristics. Nonetheless, fuel treatments play a vital role in mitigating wildfire risks and promoting ecological well-being.

## **4.b. Stand-Level Fuel Treatment Recommendations**

### **Effective Treatment Design**

Restoration-style treatments in Colorado's Front Range forests can effectively achieve both ecological and fuel reduction goals. These treatments are particularly suitable for ponderosa pine and dry-mixed conifer forests (Addington et al. 2018; Fulé et al. 2012). Prior to Euro-American settlement, these forests experienced fewer trees due to frequent wildfires (Addington et al. 2018).

The Larimer Conservation District and other land management agencies advocate a forest management approach that converts dense ponderosa forests into healthy woodlands resembling historical forests. These historical forests were sustained by wildfires and exhibited great resilience to them. James White, the Prescribed Fire and Fuels Specialist for the Arapaho/Roosevelt National Forests, emphasizes that integrating treatments across the landscape, borders, and ownerships enhances the effectiveness of treatments like broadcast burning and mechanical thinning (Avitt, 2021).

### **Holistic Approach:**

Adopting a holistic approach to forest restoration offers several benefits. It reduces the risk of crown fires, enhances the abundance and diversity of grasses, shrubs, and wildflowers, and improves habitat for various wildlife species, including deer and elk. Decades of research in forest, wildlife, and fire ecology support this approach. The U.S. Forest Service Rocky Mountain Research Station has summarized these [principles and practices for the restoration of ponderosa pine and dry mixed-conifer forests of the Colorado Front Range](#) (Addington et al. 2018). For designing restoration treatments, the document "[Visualization of Heterogenous Forest Structures Following Treatments in the Southern Rocky Mountains](#)" provides valuable visual aids, including pictures, graphs, and simulations (Tinkham et al. 2017).

### **Tree Removal Considerations:**

Removing trees can be done manually or mechanically, taking into account factors like safety, slope, road access, cost, and potential soil damage. Mechanical equipment may not be feasible on slopes steeper than 35% (Hunter et al. 2007). Handcrews using chainsaws can operate on steeper slopes, but their progress is slower compared to mechanical thinning. In cases of steep and inaccessible slopes, helicopter logging may be the only option, albeit an expensive one. It is important to have experienced and certified individuals perform tree cutting and use forestry equipment. The Colorado State Forest Service provides guidance on selecting contractors for forest management treatments.



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**Prescribed Burning:**

Broadcast prescribed burning is a highly effective method to reduce hazardous fuels and restore ecological conditions in various ecosystems, including grasslands, shrublands, and forests (Stephens et al. 2009; Paysen et al. 2000). Implementing prescribed burning in the Wildland-Urban Interface (WUI) poses challenges due to diverse fuel types, proximity to homes, smoke-related visibility impairments on roads, health impacts, and social and political concerns. However, with proper planning and qualified firefighters, prescribed fires can be conducted safely, even in the WUI (Hunter et al. 2007).

**Advantages of Prescribed Burning:**

Prescribed burning is generally more cost-effective than mechanical treatments over large areas (Hartsough et al. 2008; Hunter et al. 2007). Fire has unique effects on vegetation and soils that cannot be replicated solely through mechanical treatments (McIver et al. 2013). Thinning and burning treatments are more successful in achieving fuel reduction goals and modifying fire behavior compared to thinning alone (Prichard et al. 2020; Fulé et al. 2012).

**Managing Thinning Operations:**

Thinning operations may inadvertently increase surface fuel loads and fail to meet fire mitigation objectives if the resulting fuel (slash) is not properly addressed (Agee and Skinner 2005).



## **Ponderosa Pine and Dry Mixed Conifer**

- Ponderosa pine forests are called woodlands because they have open spaces between trees and many understory species.
- Dry mixed conifer forests are found on warm, dry south-facing slopes and contain ponderosa pine, Douglas-fir, Rocky Mountain juniper, and occasionally blue spruce.

## **Treatments for Ponderosa Pine**

- Ponderosa pine stand treatments aim to restore the site to its historical conditions.
- Common treatments include thinning to create wider spaces between trees, focusing on preserving the largest and oldest trees.
- Selective thinning and regular maintenance help maintain low regeneration levels and promote healthy trees.
- Broadcast burning is an effective treatment, as mature trees can withstand the fire while clearing the understory.
- Recommendations for treatments include following ecological restoration principles, increasing spacing between tree crowns, determining appropriate tree density, reducing ladder fuels, reducing surface fuels, strategic placement of treatments, mitigating impacts on soil compaction and erosion near streams, monitoring and maintenance of treatments, controlling invasive plant species, and documenting treatment effectiveness through pictures.
- Reducing surface fuels will decrease fire intensity and flame lengths.
- As slash decomposes very slowly in Colorado, have a plan for dealing with the slash through chipping or pile burning.
- Monitor and maintain fuel treatment areas.

## **Ponderosa Pine in Defensible Space**

- Ponderosa pines are easily thinned to create effective defensible space around homes.
- Clearing all ponderosa pines from Zone 1 and thinning and limbing trees in Zones 2 and 3 creates adequate crown spacing and vertical clearance. Recommendations are to create a minimum of 15-foot crown spacing and at least six feet of vertical clearance to the lowest hanging branches.

## **Rocky Mountain Lower Montane-Foothill Shrublands**

- Shrublands have high wildfire spread rates, especially with continuous grasses.
- Shrubs should be managed as ladder fuel in the Home Ignition Zone (HIZ).
- Clear shrubs from Zone 1, remove them from under trees in Zones 2 and 3, thin dense shrubs around structures, and irrigate and mow grasses in Zone 2.

## **Aspen and Other Riparian Hardwood Species**

- Aspen groves provide food and habitat for wildlife and are fire resistant.
- Unless they are near or over a structure, aspen groves should be left alone and not thinned or managed for fire.
- Aspen is a resilient, early-succession species that will grow back quickly after fuel treatments or fires.

- Cottonwood and willow trees stabilize riverbanks and wetland habitat and should generally be left alone unless they are near or over a structure. More information is available in the [Cottonwood Management](#) publication from the Colorado State Forest Service.







Images of the Cameron Peak Fire moving towards Black Hollow in the Poudre Canyon.  
Photos by Dan Bond.



## Priority Treatment Locations

After meeting with community members, we located and prioritized potential locations for risk reduction work in the Poudre Canyon Fire Protection District. Because of the steep sides of the Poudre Canyon, stakeholders we met with identified that work in the canyon would need to be done by handcrews. Mastication and other mechanical treatment would not work in the canyon.

In February 2023 we shared our assessment with land managers and other partners with the Ben Delatour Scout Ranch, Coalition for the Poudre River Watershed, Colorado State Forest Service, Larimer County Office of Emergency Management, Larimer County Sheriff's Office Emergency Services, Larimer Conservation District, and U.S. Forest Service for their input. Often these treatment areas cross ownership boundaries and will require collaboration between private landowners, public land managers, and forestry professionals to create successful outcomes.

Risk reduction activities were identified in the four planning units: Poudre Park, Rustic, Spencer Heights, and Manhattan Creek. They fell into some common activities:

- Protecting Homes - Home Hardening and HIZ work.
- Mitigating Roads and Driveways
- Community Education
- Demonstration Sites
- Fuel Breaks

This plan shows a need to hire someone who will help coordinate between ownership boundaries, oversee the work to be done, work with homeowners on mitigation, develop and implement a community educational plan which would include development of demonstration sites.

Figure 4.b.1 Map of PCFPD Planning Units.

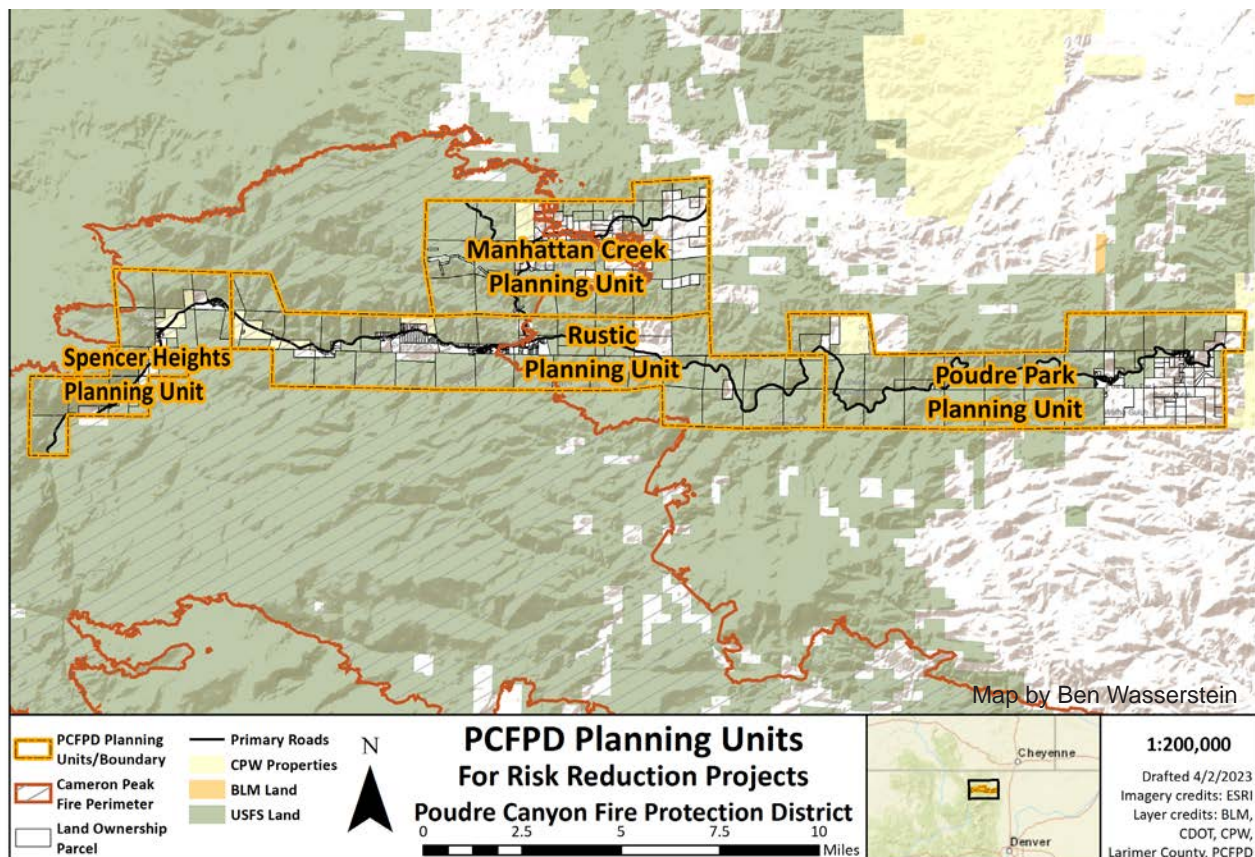


Table 4.b.1 Risk Reduction Projects

It should be noted that because of the steep nature of the Poudre Canyon in most areas, mastication and other mechanical methods of thinning forest will not work.

| P<br>O<br>U<br>D<br>R<br>E<br><br>P<br>A<br>R<br>K | Project   | Description of Project  | Stakeholder Responsibility                              | Priority |
|--|---|---|---|----------|
|  | Mitigating homes from Gateway Park to Mishawaka   | Home hardening and mitigation of HIZ<br>Method: hand crews, slash pile burning, chipping  | Homeowners<br>Hand crews                                | High     |
|  | Roads and driveways from Gateway Park to mile marker 100                                    | Including but not limited to: Kings Canyon, Unger Mountain, Manners Lane, Poudre River Road and numerous driveways along Hwy 14.<br>Method: hand crews with chipping  | Homeowners<br>Hand crews<br>CDOT<br>USFS                | High     |
|  | Education campaign  | Community meetings on mitigation.<br>Meeting one on one with homeowner to discuss mitigation - need to hire someone to do this work;<br>Put information in newsletter for distribution.<br>Email educational information  | Lower Poudre Canyon Association<br>PCFPD<br>Hired staff | Medium   |
|  | Community demonstration site  | Find a place that demonstrates both home hardening and good mitigation<br>Arrange for time for people to view demonstration site.   | Hired staff<br>Community association                    | Medium   |
|  | Mark bridges for weight limits  | There are many bridges with no signage as to weight limits.   | County Engineer   | High     |
|  | Mitigating homes from 26976 Hwy 14 to Black Hollow Rd                                       | Home hardening and mitigation of HIZ<br>Method: hand crews, slash pile burning, chipping  | Homeowners<br>Hand crews                                | High     |
|  | Roads and driveways from mile marker 100 to Black Hollow Rd                                 | Including but not limited to Rustic Road, Crown Point Road, U Bar U Lane, Meadow Lane, Riverside Drive and numerous driveways along Hwy 14.<br>Method: hand crews with chipping   | Homeowners<br>Hand crews<br>CDOT<br>USFS                | High     |
|  | Fuel break  | In the area south of Crown Point Road there is old dozer line that could be expanded into fire break for community.   | USFS  | Low      |
|  | Education campaign  | Community meetings on mitigation.<br>Meeting one on one with homeowners to discuss mitigation - need to hire someone to do this work;<br>Put information in newsletter for distribution.<br>Email educational information | Upper Poudre Canyon Association<br>PCFPD<br>Hired staff | Medium   |
| R<br>U<br>S<br>T<br>I<br>C                         | Community demonstration site - make the firehouse and church area into a demonstration site | Find a place that demonstrates both home hardening and good mitigation<br>Arrange for time for people view demonstration site.  | Hired staff<br>UPCA<br>Church<br>PCFPD                  | Medium   |
|  | Mark bridges for weight limits  | There are many bridges with no signage as to weight limits  | County Engineer   | High     |
|  | Repair and add dry wells  | The only dry well in the Rustic area needs to be repaired   | PCFPD   | High     |



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| <b>Project</b>  | <b>Description of Project</b>  | <b>Stakeholder Responsibility</b>                 | <b>Priority</b> |
|---|--|---|-----------------|
| Mitigating homes from Black Hollow to Poudre Falls.                 | Home hardening and mitigation of HIZ<br>Method: hand crews, slash pile burning, chipping   | Homeowners<br>Hand crews<br>PCFPD                 | High            |
| Roads and driveways from Black Hollow to Poudre Falls.              | Including but not limited to: Washout Gulch, Williams Gulch, Shady Lane, Shetland Street and numerous driveways along Hwy 14.<br>Method: hand crews with chipping  | Homeowners<br>Hand crews<br>CDOT<br>USFS<br>PCFPD | High            |
| Fuel break  | The area south of Shetland Street is fairly open and could be made into a fuel break to protect the homes along that road.   | Unknown who owns the land, possibly USFS.         | Medium          |
| Education campaign  | Community meetings on mitigation.<br>Meeting one on one with homeowners to discuss mitigation - need to hire someone to do this work;<br>Put information in newsletter for distribution.<br>Email educational information. | PCFPD   | Medium          |
| Mark bridges for weight limits                                      | There are many bridges with no signage as to weight limits   | County Engineer                                   | Medium          |
| Add dry well and water sources                                      | Establish dry well and or good access point to obtain water for fire trucks  | PCFPD   | High            |
| Mountain Plover Road mitigation                                     | This is the access road for four homes, it is narrow in places with trees right up to the road. Trees need to be removed and thinned along road and driveway.  | Hand crews<br>Homeowners                          | High            |
| Forest Service land adjacent to private land                        | Forest needs to be thinned and cleaned up along 1/2 mile of private lands in this area and piles they cut years ago need burned.   | USFS  | High            |
| Private land along CR 68C and CR 69 - Scout Ranch to Goodell Corner | Mitigation around homes and forest thinning on larger properties. Driveway mitigation.   | Land owners<br>Hand crews<br>PCFPD                | High            |
| Drala Mountain Center   | Continue mitigation, restoration efforts.  | Drala   |                 |
| Ben Delatour Scout Ranch  | Maintain treated areas. Continue with planned mitigation   | BDSR  |                 |

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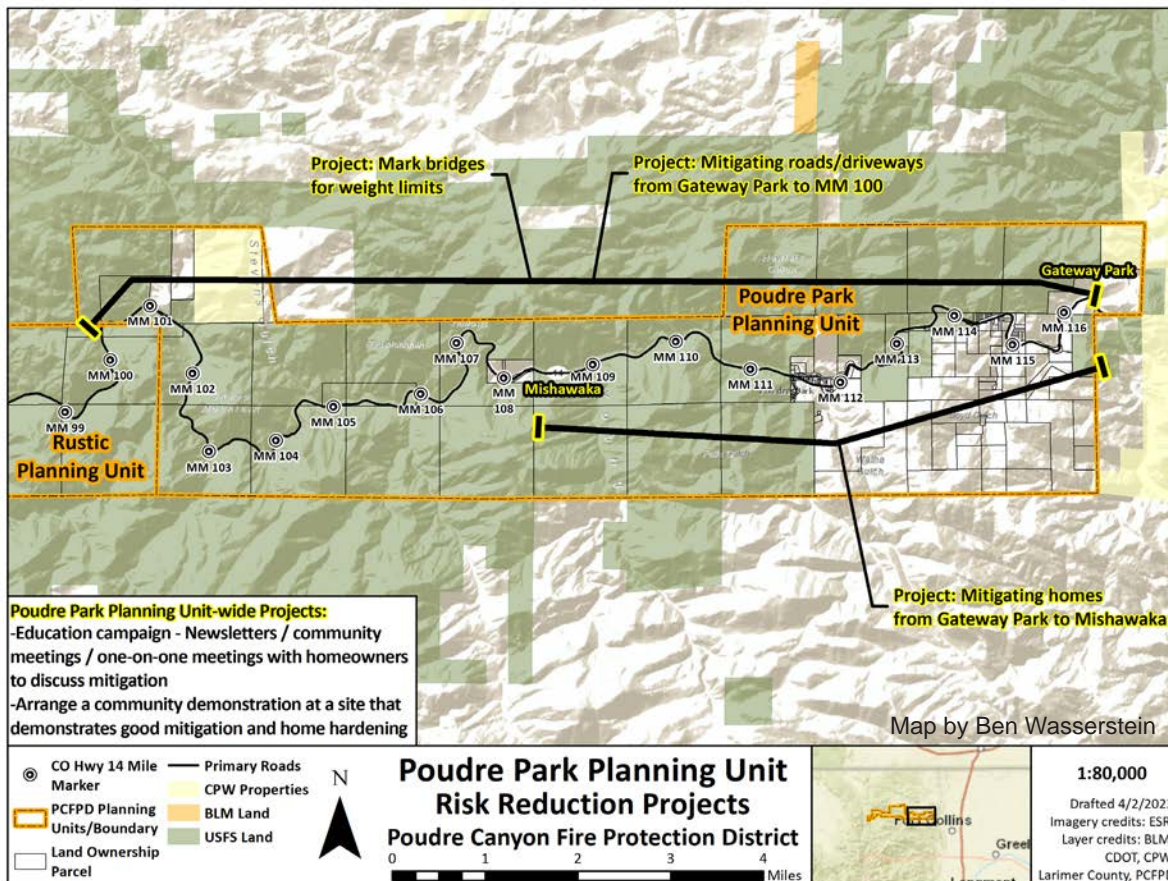


Figure 4.b.2 Map of Poudre Park Planning Unit.

Figure 4.b.3 Map of Rustic Planning Unit.

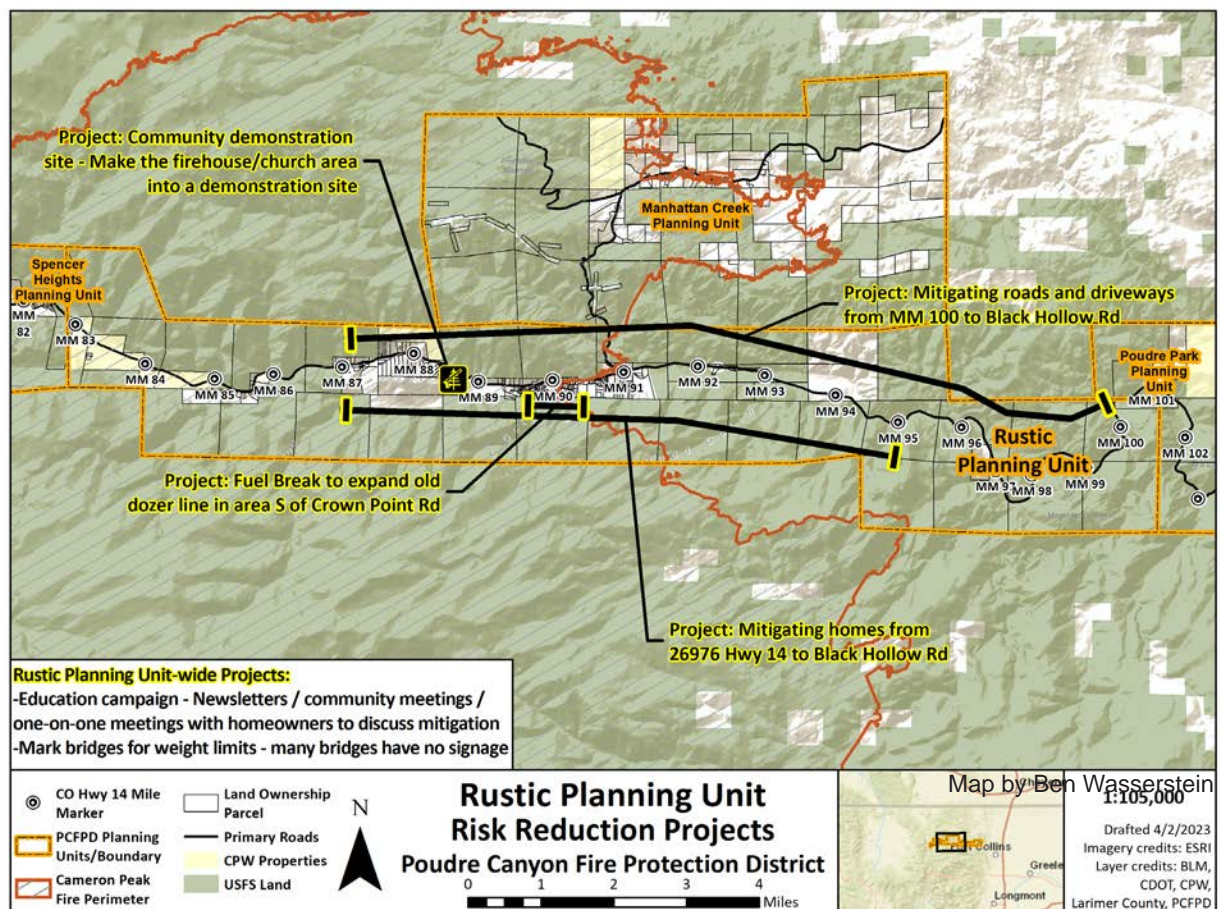




Figure 4.b.4 Map of Spencer Heights Planning Unit.

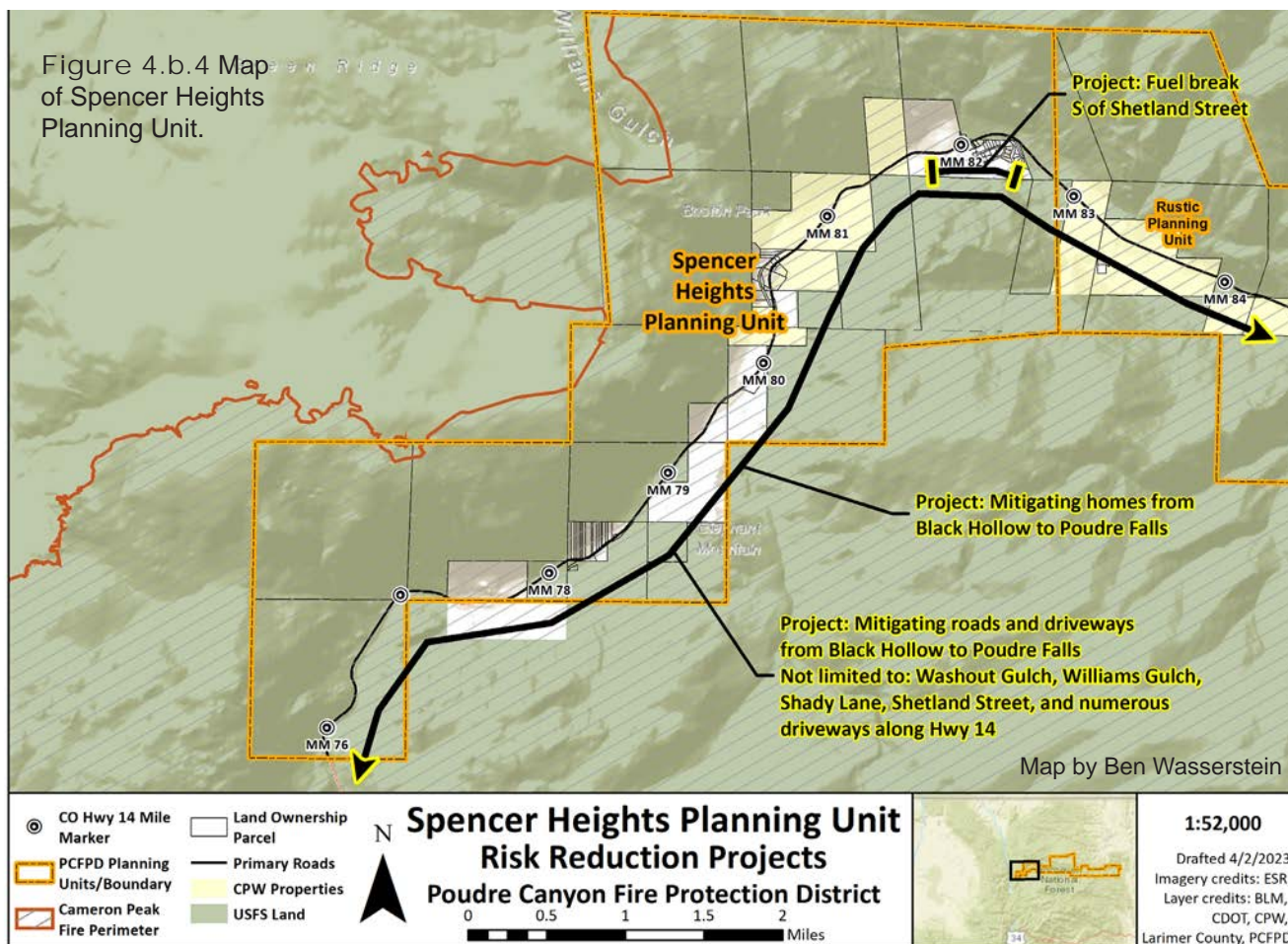
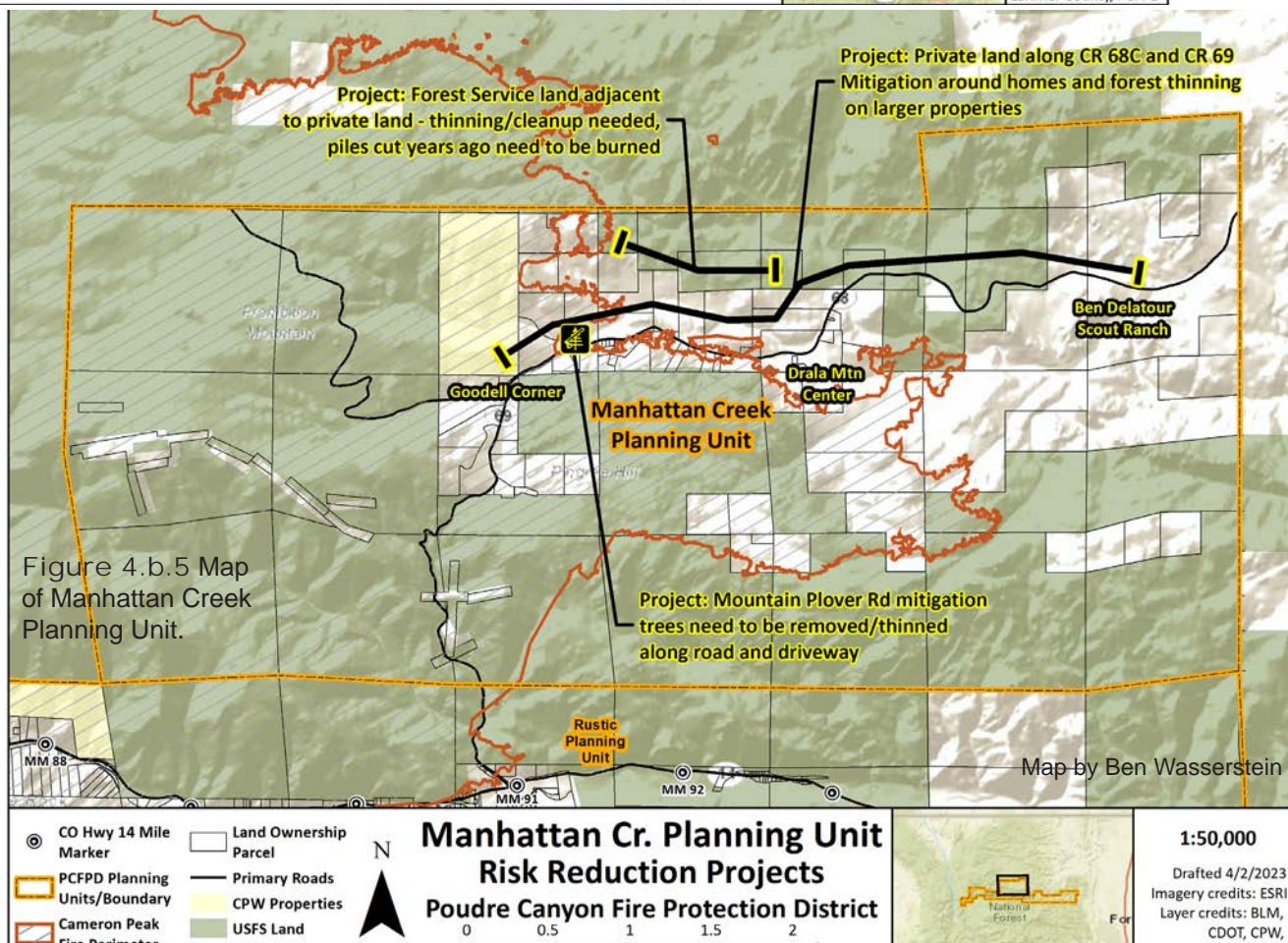


Figure 4.b.5 Map of Manhattan Creek Planning Unit.





## **4.c. Roadway Fuel Treatment Recommendations**

### **Designing Effective Treatments**

The main goal of fuel treatments is to greatly reduce flammable materials near roadways during wildfires, creating safer conditions for evacuation. These treatments can follow principles of ecological restoration, but sometimes it's best to remove trees completely, especially in areas where evacuation routes are narrow. Here are some general guidelines for creating and maintaining fuel treatments along roadways. You can find pictures of roadways with improvement suggestions in Table 4.c.1, provided by PCFPD.

- The width of an effective fuel treatment along a roadway depends on various factors like slope, forest type, stand density, and the amount of flammable materials present. According to CSFS recommendations (Figure 4.c.1), treatments should extend 150 to 240 feet on the downhill side of the road and 100 to 150 feet on the uphill side. Wider treatments are needed on steeper slopes because fires tend to intensify when moving uphill.
- To reduce the risk of fire spreading, it's important to eliminate ladder fuels, which include seedlings, saplings, and tall shrubs. Prune branches on remaining trees to a height of at least 10 feet.
- Ensure fire engine access by removing trees along narrow driveways. The horizontal clearance should be at least 20 feet. Also, trim low-hanging branches of remaining trees to maintain a vertical clearance of at least 13 feet and 6 inches.
- Increasing the spacing between tree crowns helps reduce the risk of crown fires. On flat ground, remove trees to create at least 15 feet of space between crowns. Steeper slopes require wider spacing due to the increased fire risk (see Table 4.b.1).
- Remove trees that lean over roads or are dead and close to roads, as they can block access during a wildfire.
- To decrease fire intensity and flame lengths, reduce surface fuels. However, simply moving tree crowns to the ground without reducing the overall fuel load is not effective. Proper disposal of slash, the woody debris left after thinning operations, is crucial since it decomposes slowly in Colorado. Refer to Section 4.d, Slash Management, for guidance on handling slash.
- Annually reduce the height of grasses near roads by burning or mowing them. This helps prevent the rapid spread of fires.
- Strategically plan treatments to assist firefighters, create safer conditions on frequently used roads, and improve access to properties.
- When conducting treatments near streams and riparian ecosystems, take measures to minimize soil compaction and erosion caused by tree removal. The Colorado State Forest Service recommends stream side management zones of at least 50 feet (CSFS 2010).
- Regular monitoring and maintenance of fuel treatments are necessary. The benefits of these treatments diminish over time, with the duration of their effectiveness

depending on forest type, topography, seedling regeneration rates (which are often influenced by precipitation), and the number of trees removed during treatments.

- Monitor treatments for invasive weed species that may require control after the forest treatments.
- Capture before-and-after photographs of the treatments to evaluate their effectiveness and track changes over time (refer to Figure 3.a.3 for an example of pre-and post-treatment photographs).






| Roadway Examples   | Suggestion for Improvement  |
|--|---|
|    | <ul style="list-style-type: none"> <li>• Remove trees to increase crown spacing. Effective crown spacing and fuel treatments depth from road depends on slope (Table 4.b.1; Table 4.c.2).</li> <li>• Remove limbs on remaining trees to above 10 feet.</li> <li>• Remove small trees and shrubs that could act as ladder fuels.</li> <li>• Ensure clear, reflective road signs are visible.</li> <li>• Create space for emergency vehicles to turnaround.</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>• Remove trees to increase crown spacing. Effective crown spacing and fuel treatments depth from road depends on slope (Table 4.b.1; Table 4.c.2).</li> <li>• Remove limbs on remaining trees to above 10 feet.</li> <li>• Remove small trees and shrubs that could act as ladder fuels.</li> <li>• Install mirrors on switchbacks to improve visibility.</li> <li>• Ensure clear, reflective road signs are visible.</li> <li>• Create space for emergency vehicles to turnaround.</li> </ul> |
|  | <ul style="list-style-type: none"> <li>• Remove trees to increase crown spacing. Effective crown spacing and fuel treatments depth from road depends on slope (Table 4.b.1; Table 4.c.2).</li> <li>• Remove limbs on remaining trees to above 10 feet.</li> <li>• Remove small trees and shrubs that could act as ladder fuels.</li> <li>• Do not park alongside narrow roads in order to ensure enough horizontal clearance for emergency vehicles.</li> </ul>   |
|  | <ul style="list-style-type: none"> <li>• Road is survivable due to mowed grass.</li> <li>• Roads are flat and relatively wide, and driveways offers turnarounds for emergency vehicles.</li> <li>• Continue mowing along the side of the road.</li> <li>• Ensure clear, reflective road signs are visible.</li> </ul>   |
|  | <ul style="list-style-type: none"> <li>• Driveway is likely survivable due to tree spacing and removal of lower limbs.</li> <li>• Driveway is wide, flat, and offers turnarounds for emergency vehicles.</li> <li>• Maintain vertical clearance and eliminate ladder fuels by limbing trees to above 10 feet as they regrow.</li> <li>• Remove more trees to increase crown spacing to at least 10 feet along the road and within the home ignition zone.</li> <li>• Ensure clear, reflective road signs are visible.</li> </ul>      |

Table 4.c.1. Examples of conditions occurring along roadways and suggestions for improvement. Source: Ember Alliance.



Table 4.c.2. Minimum fuel treatments width uphill and downhill from roads depend on the slope along the roadway<sup>1</sup>. Recommendations from the Colorado State Forest Service (Dennis 2005).

| Percent of Slope | Downhill Distance (feet) | Uphill Distance (feet) | Total Treated Area (feet) |
|------------------|--------------------------|------------------------|---------------------------|
| 0                | 150                      | 150                    | 300                       |
| 10               | 165                      | 140                    | 305                       |
| 20               | 180                      | 130                    | 310                       |
| 30               | 195                      | 120                    | 315                       |
| 40               | 210                      | 110                    | 320                       |
| 50               | 225                      | 100                    | 325                       |
| 60               | 240                      | 100                    | 340                       |
|                  |                          |                        |                           |

<sup>1</sup>Measurements are from the toe of road fill for downhill distances and above the road cut for uphill distances. Distances are measured parallel to flat ground, not along the slope. See Figure 4.c.1 for a visual representation of measurements for roadway fuel treatments.

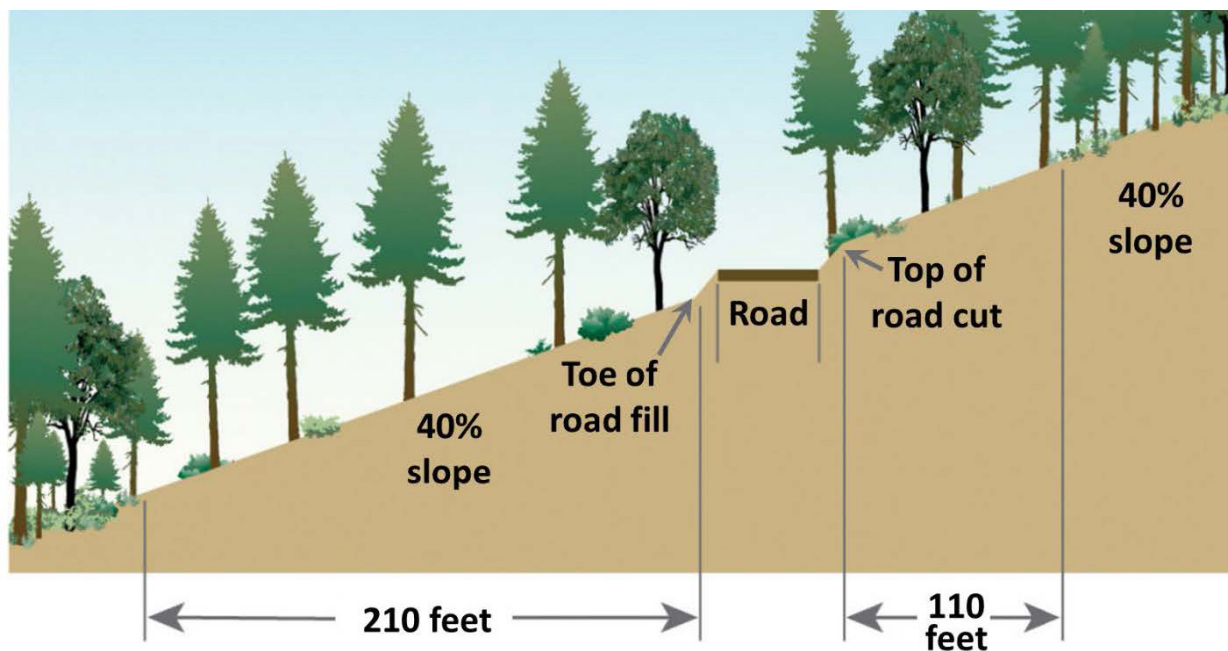


Figure 4.c.1. Fuel treatment width must be greater on the downhill side of the road due to the exacerbating impact of slope on fire intensity when fires travel uphill. Figure modified from Bennett et al. (2010).

Table 4.c.3. Total length of first, second, and third priority roads, private drives, and driveways for roadside fuel treatments within the PCFPD, and the names of roads with at least 0.25 miles identified as a priority location. Roads are ordered by treatment areas.

|  | Road   | Length   | Priority        | Responsibility                                       |
|--|--|----------|-----------------|--|
| <b>P<br/>O<br/>U<br/>D<br/>R<br/>E</b>                   | Hwy 14 - MM 109 to MM 113 trees removed from close to road             | 5 miles  | First Priority  | CDOT<br>Forest Service                               |
|  | Kings Canyon   | 1 mile   | First Priority  | Hand crews   |
|  | Unger Mountain   | 1 mile   | Second Priority | Hand crews   |
|  | Poudre River Rd - north east corner brush needs to be removed          | 1/8 mile | Third Priority  | CDOT   |
|  | Narrows - trees need to be removed along the road                      | 1/4 mile | First Priority  | CDOT   |
| <b>R<br/>U<br/>S<br/>T<br/>I<br/>C</b>                   | Rustic Road - 162 & 330 need work, Many places along road need work    | 1/4 mile | First Priority  | Homeowners<br>Hand crews                             |
|  | Crown Point Road needs maintained                                      | 1/4 mile | Third Priority  | Homeowners   |
|  | U Bar U Lane needs mitigated   | 1/4 mile | Second Priority | Homeowners<br>Hand crews                             |
|  | Riverside - Addresses 110 & 225 need work                              | 1/4 mile | Second Priority | Homeowners<br>Hand crews                             |
|  | Norman Fry - bridge needs clean up near entry                          | 1/8 mile | Second Priority | Homeowners<br>Hand crews                             |
| <b>S<br/>P<br/>E<br/>N<br/>G<br/>H<br/>T<br/>S</b>       | Arrowhead lodge needs mitigation in areas fire did not clean up        | 1/8 mile | Second Priority | USFS   |
|  | Hwy 14 MM 84 - MM87  | 4 miles  | First Priority  | CDOT<br>Forest Service                               |
|  | Big Bend Lane - trees need trimmed from road                           | 1/4 mile | Second Priority | Homeowners<br>Hand crews                             |
|  | Shetland - area near bridge needs cleaned up                           | 1/8 mile | First Priority  | Homeowners<br>Hand crews                             |
|  | Shady Lane - serious thinning at entry                                 | 1/8 mile | First Priority  | Hand crews   |
| <b>M<br/>A<br/>N<br/>H<br/>A<br/>T<br/>T<br/>A<br/>N</b> | Mountain Plover - trim trees and brush away from road, mow grasses     | 1 mile   | High Priority   | Homeowners<br>Hand crews                             |
|  | Eastern Sun Court - trim limbs higher so Type 2 can have access        | 1/4 mile | Third Priority  | Landowner  |
|  | CR 69 - some trees need to be removed from near road                   | 1/2 mile | Third Priority  | County Road & Bridge                                 |
|  | CR 69 & Hwy 14 - Brush needs to be removed from creek & road           | 1/4 mile | Second Priority | County Road & Bridge<br>Who owns the water in creek? |
|  | Drala Mtn - road that goes to 40 acres on top needs trees trimmed back | 1 mile   | First Priority  | Landowner<br>Handcrews                               |



## **4.d. Slash Management**

Thinning, harvesting, and other forest management activities can inadvertently increase the risk of fires if the resulting debris, known as slash, is not properly addressed. Slash includes small trees, limbs, bark, and treetops. Effective slash management is crucial in the forest management process to reduce fuel loads and maintain fire safety. Neglecting slash management can lead to a false sense of security, divert funds from more strategic projects, and endanger lives. This article explores the importance of managing slash, particularly in roadway fuel treatments, and discusses various methods for effective management.

### **1. Importance of Slash Management:**

- Thinning or harvesting operations can increase surface fuel loads if slash is not addressed.
- Poor-quality fuels treatments can fail to reduce fuel loads, increase surface fuels, and undermine fire mitigation objectives.
- Such treatments create a false sense of security among residents and fire suppression personnel, wasting limited funds.

### **2. Slash Management in Roadway Fuel Treatments:**

- Leaving untreated slash in roadway fuel treatments is counterproductive and can pose risks during wildfires.
- Slash management along roadways is easier and cheaper due to accessibility.
- Roads can serve as effective holding features for controlled burning in different seasons.

### **3. Challenges in Slash Removal:**

- Limited biomass and timber industries in Colorado make slash removal difficult.
- Different methods of managing slash have their own benefits and challenges.
- Common methods like lop-and-scatter and mastication rearrange surface fuels but don't remove them effectively.
- Slash can take a decade or more to decompose, making broadcast prescribed burning and pile burning more effective at removing surface fuels.

### **4. Broadcast Prescribed Burning:**

- Broadcast prescribed burning is the most effective method to manage biomass, create healthy forest conditions, and reduce wildfire risk.
- It mimics natural wildfires, treats large areas, consumes surface fuels, and is cost-effective.
- Highly qualified individuals conduct prescribed burns with carefully constructed plans, ensuring safety and minimizing escapes.
- The rare escape, like the Elkhorn Prescribed Burn, provides valuable lessons for improved future burns.
- Agencies have successfully conducted prescribed burns in Wildland-Urban Interface (WUI) areas.

### **5. Pile Burning:**

- Pile burning involves burning discrete piles of debris and can be done when the ground is covered in snow.
- Embers from burn piles have a lower risk of igniting spot fires or structures compared to embers from crown fires.

- Proper pile construction is critical for effective burning, and burning older piles is less efficient.
- Mitigation measures may be necessary after pile burning, such as raking burnt soil and seeding native plants.

## 6. Regulations and Permits:

- Broadcast burning in Colorado is regulated by various agencies, including the Division of Fire Prevention and Control (DFPC) and the Colorado Department of Public Health and Environment.
- Pile burning requires proper permits and adherence to guidelines, including smoke permits and open burn permits.
- DFPC's certified burner program offers civil liability protection to individuals leading burns if all legal requirements are met.

### Conclusion:

Proper slash management is essential for mitigating fire risks in forests. It involves effectively addressing slash generated by thinning and harvesting operations. Neglecting slash management can lead to increased fire hazards, wasted resources, and false security. Methods such as broadcast prescribed burning and pile burning are effective in reducing surface fuels. Regulated by various agencies, these methods ensure safety and contribute to healthier fire-adapted ecosystems.

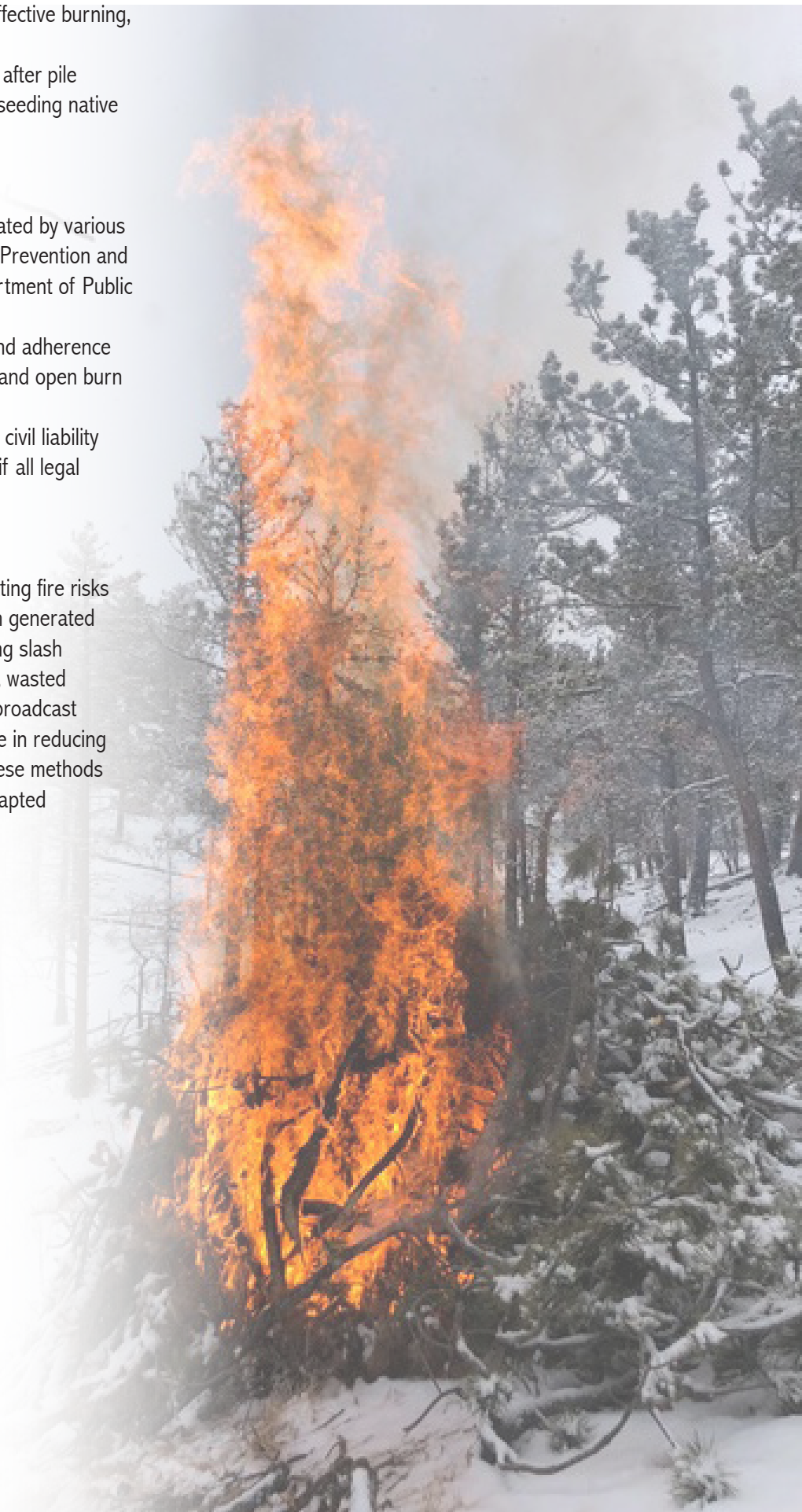


Table 4.d.1. Several methods are available to remove slash created by forest thinning, each with their own benefits and challenges. Source: Ember Alliance.

| Slash Management                    | Description   | Benefit   | Hazard  |
|-------------------------------------|---|---|---|
| <b>Broadcast prescribed burning</b> | <ul style="list-style-type: none"> <li>Broadcast prescribed burning is generally the most effective method to manage slash. Prescribed burning mimics naturally occurring wildfire, can treat hundreds of acres at a time, consumes the surface fuel, and is relatively cost-effective (Prichard et al. 2020; Fulé et al. 2012).</li> <li>Broadcast burning is regulated in Colorado by the Division of Fire Prevention and Control, Department of Public Health and Environment, local sheriff's offices, and fire departments as outlined in the 2019 Colorado Prescribed Fire Planning and Implementation Policy Guide.</li> </ul> | <ul style="list-style-type: none"> <li>Extremely effective at reducing surface, ladder, and canopy fuel loads (Prichard et al. 2020; Fulé 2012).</li> <li>Can restore ecosystem function in frequent-fire forests (McIver et al. 2013; Addington et al. 2018).</li> <li>Generally cheaper than mechanical treatments (Prichard et al. 2020).</li> <li>Can be safely and successfully conducted with proper planning and implementation by qualified firefighters.</li> <li>Can reduce property damage during wildfires by effectively reducing fuel loads (Loomis et al. 2019).</li> </ul>  | <ul style="list-style-type: none"> <li>Requires careful planning and tactical decisions to prevent smoke from impacting sensitive populations and roadways.</li> <li>Public concerns about risk from flames, embers, and smoke.</li> <li>Limited opportunities to conduct burns under appropriate fire weather conditions.</li> <li>Limited resource availability to conduct burns during the wildfire season.</li> </ul> |
| <b>Pile burning</b>                 | <ul style="list-style-type: none"> <li>Pile burning involves placing, laying, heaping, or stacking slash into piles that are then ignited to consume the material. Piles can be constructed by hand or with mechanical equipment. See the 2015 Colorado pile construction guide for guidance on planning, constructing, and burning piles. See regulations for pile burning on the burn permit website for the Larimer County Department of Health and Environment.</li> </ul>  | <ul style="list-style-type: none"> <li>Reduces surface fuel loads.</li> <li>Generally cheaper than removing material from the site.</li> <li>Lower complexity than broadcast prescribed burning because fire activity is limited to discrete piles and burns can be conducted when snow covers the ground.</li> <li>Can be safe and successful with proper planning and implementation.</li> </ul>  | <ul style="list-style-type: none"> <li>Old and improperly constructed piles can be difficult to ignite and experience poor consumption.</li> <li>Unburnt slash piles can become a hazard during wildfires, especially if loose logs catch fire and roll down slopes.</li> <li>Limited opportunities to conduct burns because of requirements for snowpack and wind ventilation.</li> </ul>                                |
| <b>Air curtain burner</b>           | <ul style="list-style-type: none"> <li>Air curtain burners are machines that burn woody material cleanly in contained space. They typically consist of a box or trench into which slash is loaded and ignited. A strong fan blows a curtain of air down and over the burning material in a way that keeps oxygen flowing through the fire and keeps smoke from escaping out the top. Carbon from the smoke is filtered out of the air and kept inside the box.</li> </ul>   | <ul style="list-style-type: none"> <li>Air curtain burners can be used under a much wider range of conditions and locations than pile burning or broadcast burning and can be contained and extinguished quickly and easily.</li> <li>They produce significantly less smoke than open burns and can be placed in accessible locations in the WUI.</li> <li>Air curtain burners can burn more kinds of slash than pile burning, including green wood, lumber, and general yard waste.</li> <li>They can be an acceptable form of burning slash where there is not social license for pile or broadcast burning.</li> <li>Ash from the burner can be redistributed and return nutrients to the ground.</li> </ul> | <ul style="list-style-type: none"> <li>Air curtain burners are expensive to obtain and require professionals to operate them.</li> <li>Slash material needs to be transported from locations throughout the community to where the burner is located.</li> <li>If the ash is not distributed, it won't return the nutrients to the ground.</li> </ul>   |



|                                |  |  |   |
|--------------------------------|--|--|---|
| <b>Community Slash Pile</b>    | <ul style="list-style-type: none"> <li>Residents take slash from their property to a designated location that is managed by the community. The community manages the slash for the residents via pile burning or chipping.</li> </ul>  | <ul style="list-style-type: none"> <li>Residents are not responsible for burning or chipping their own material. It immediately reduces the fuel loading on their properties.</li> <li>If the material is chipped or burned, it can be redistributed to the community as mulch or ash to return the nutrients to the ground.</li> </ul>  | <ul style="list-style-type: none"> <li>The success of this is dependent on the managers of the community slash piles to properly burn the piles.</li> <li>The community piles must have a plan to be burned. If they are left in the community, they can pose a fire risk.</li> <li>If the material is not distributed, it won't return the nutrients to the ground</li> </ul>  |
| <b>Lop-and-scatter</b>         | <ul style="list-style-type: none"> <li>Lopping involves cutting limbs, branches, treetops, smaller-diameter trees, or other woody plant residue into shorter lengths, and scattering involves spreading lopped slash so it lies evenly and close to the ground. Cut into pieces less than 24 inches long. This method is better suited to areas with low slash accumulations. Lop-and-scatter should not be used in defensible space zones 1 or 2 or 3.</li> </ul> | <ul style="list-style-type: none"> <li>Reduces the height of slash relative to untreated slash, therefore increasing the distance between surface and canopy fuels (but not as effectively as broadcast prescribed burning or pile burning).</li> <li>Breaks slash up into smaller pieces and distributes it closer to the forest floor, which can encourage faster decomposition.</li> </ul>  | <ul style="list-style-type: none"> <li>Does not remove surface fuels from the site, it just restructures the way fuels are arranged.</li> <li>Can contribute to more intense fire behavior by not addressing increased surface fuel loads created by thinning (Hunter et al. 2017; Agee and Skinner 2005).</li> </ul>   |
| <b>Mastication or chipping</b> | <ul style="list-style-type: none"> <li>Mastication involves using specialized machines like a tow-behind chipper or a hydro-ax to grind up standing saplings and shrubs and cut slash into medium-sized chips. Chipping involves processing slash through a mechanical chipper to break slash into small chips or shreds. Operators should follow mastication guidance.</li> </ul>   | <ul style="list-style-type: none"> <li>Reduces the height of slash relative to untreated slash, therefore increasing the distance between surface and canopy fuels (but not as effectively as broadcast prescribed burning or pile burning).</li> <li>Breaks slash up into smaller pieces and distributes it closer to the forest floor, which can encourage faster decomposition.</li> <li>Can produce landscape mulch to be used offsite.</li> <li>Can reduce fire intensity and slow rates of spread, enhancing suppression efficacy (Kreye et al. 2014).</li> <li>If chips are removed from the site, this is a very effective tool to completely remove fuels from a location.</li> </ul> | <ul style="list-style-type: none"> <li>Does not remove surface fuels from the site, it just restructures the way fuels are arranged.</li> <li>Masticated and chipped fuels are unlike natural surface fuels in terms of their shape, depth, and highly compact nature (Kreye et al. 2014).</li> <li>Masticated and chipped fuels can impede plant regeneration, particularly when the depth of masticated and chipped fuels exceeds 4 inches (Jain et al. 2018).</li> <li>When chips or masticated materials are not removed, smoldering fires in masticated and chipped fuels can be difficult to suppress, produce abundant smoke, kill tree roots, and lead to spot fires if high winds reignite masticated fuels and blow them across containment lines (Kreye et al. 2014).</li> </ul> |



Prescribed burn outside Rustic in 2019

#### **4.e. The Future of the CWPP and Implementation Plan**

The CSFS requires CWPPs to be updated on a regular basis. It is recommended to update them every five years, at minimum. CWPPs greater than 10 years old are outdated and can exclude communities from successfully applying for competitive funding opportunities.

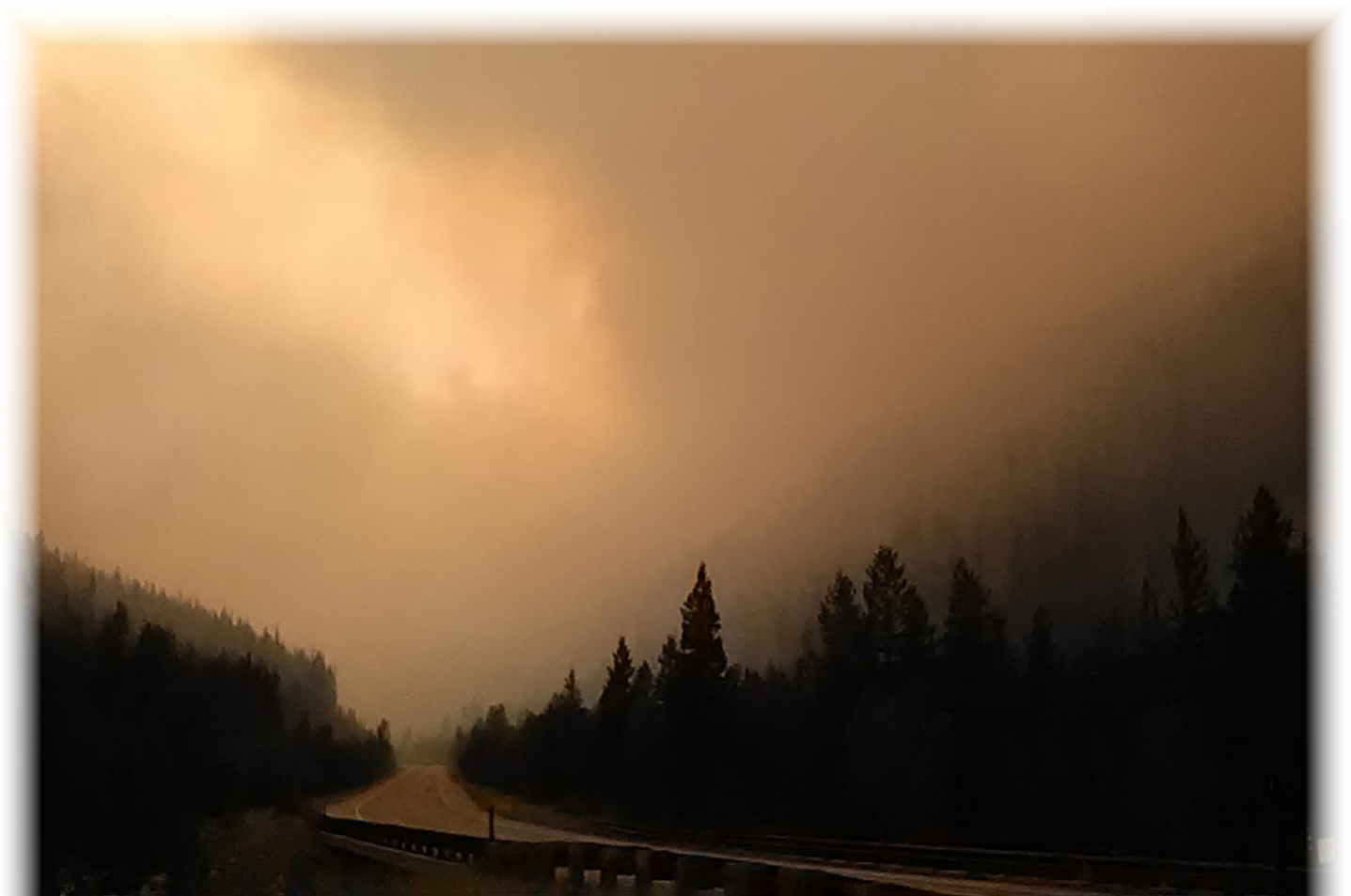
The update to this plan can either be a preface to this document or a new document that integrates with this one. The update to this plan must include:

- A description of progress made since the CWPP was created
- A description of demographic changes in the community and other important infrastructure changes
- Identification of new risks in the community
- Updated risk analysis if major changes have happened between revisions
- Updated and prioritized projects for the community with maps and descriptions

The suggested review process by CSFS involves:

- Reviewing the existing CWPP
- Engaging stakeholders that have a vested interest in the plan
- Hosting collaborative meetings
- Documenting completed projects and demographic and landscape changes
- Developing updated wildfire risk reduction priorities
- Updating maps
- Distributing updated drafts to key stakeholders for review and input prior to final approval
- Finalizing with core team signatures and submit to CSFS State Office

Smoke from Cameron Peak Fire. Photo by Paula Collins.



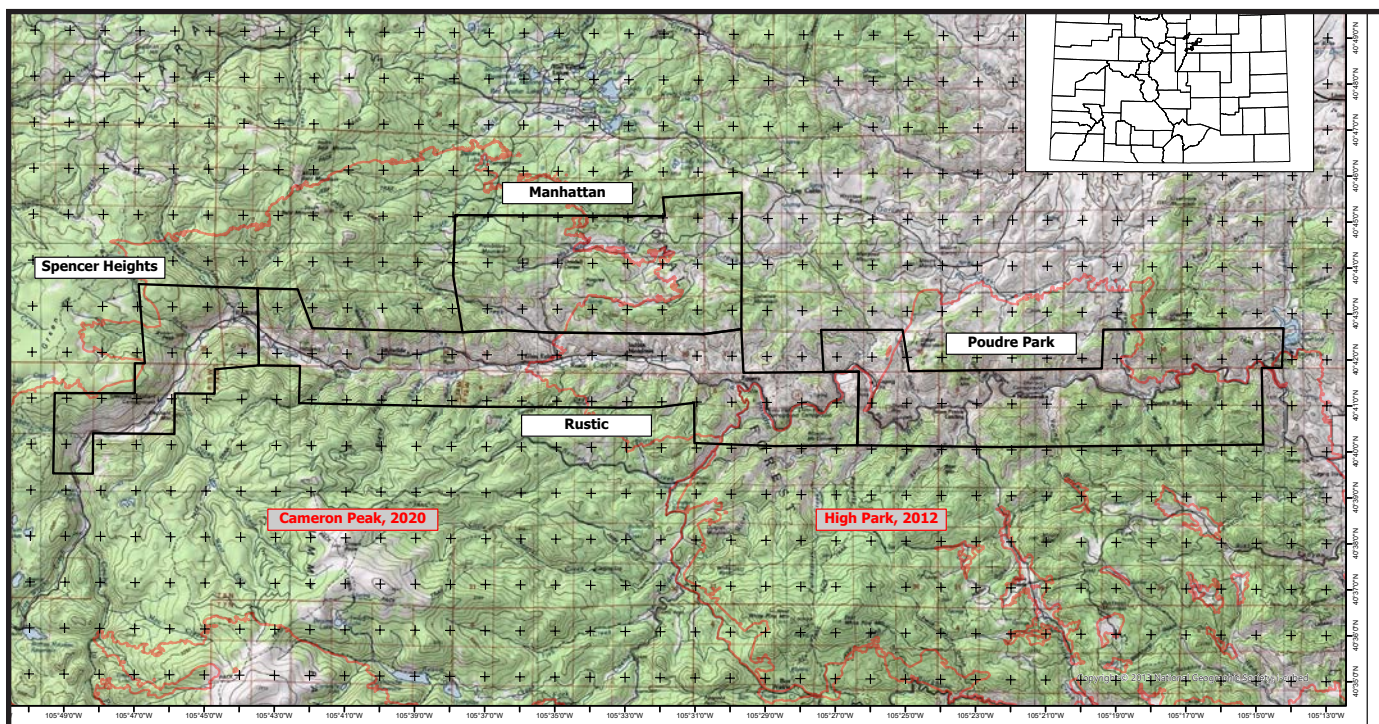


## 4.f. Community Risk Assessment and Modeling Methodology

The way we determine the risk of wildfires in our community involves studying how fires behave, creating models, and observing the area firsthand. We looked at data from the PCFPD wildland fire responses, past fire behavior and used it to make recommendations on how to best protect people, homes, roads, and nature.

### 4.f.a. CWPP Plan Units

To help residents work together and reduce the risk of fires, we divided the area into smaller sections called plan units. We looked at things like where people live, how the roads connect, the shape of the land, previous fires, and historical information to determine the boundaries of these units. We also considered who owns the land in each cluster and focused on private property ownership. Boundaries units were based on what we learn from the people in the PCFPD.



### 4.f.b. Fire Behavior Analysis

#### Interpretations and Limitations

Fire behavior analysis helps us understand how wildfires might behave and where they could pose a risk to people, property, and other valuable things. These analyses are based on extensive research done over many years.

However, it's important to know the limitations of fire behavior models. They can't predict exactly how a fire will behave near individual homes because there are too many factors to consider, such as weather conditions, where the fire starts, and firefighting efforts. Even when a fire is happening, it can still be unpredictable.



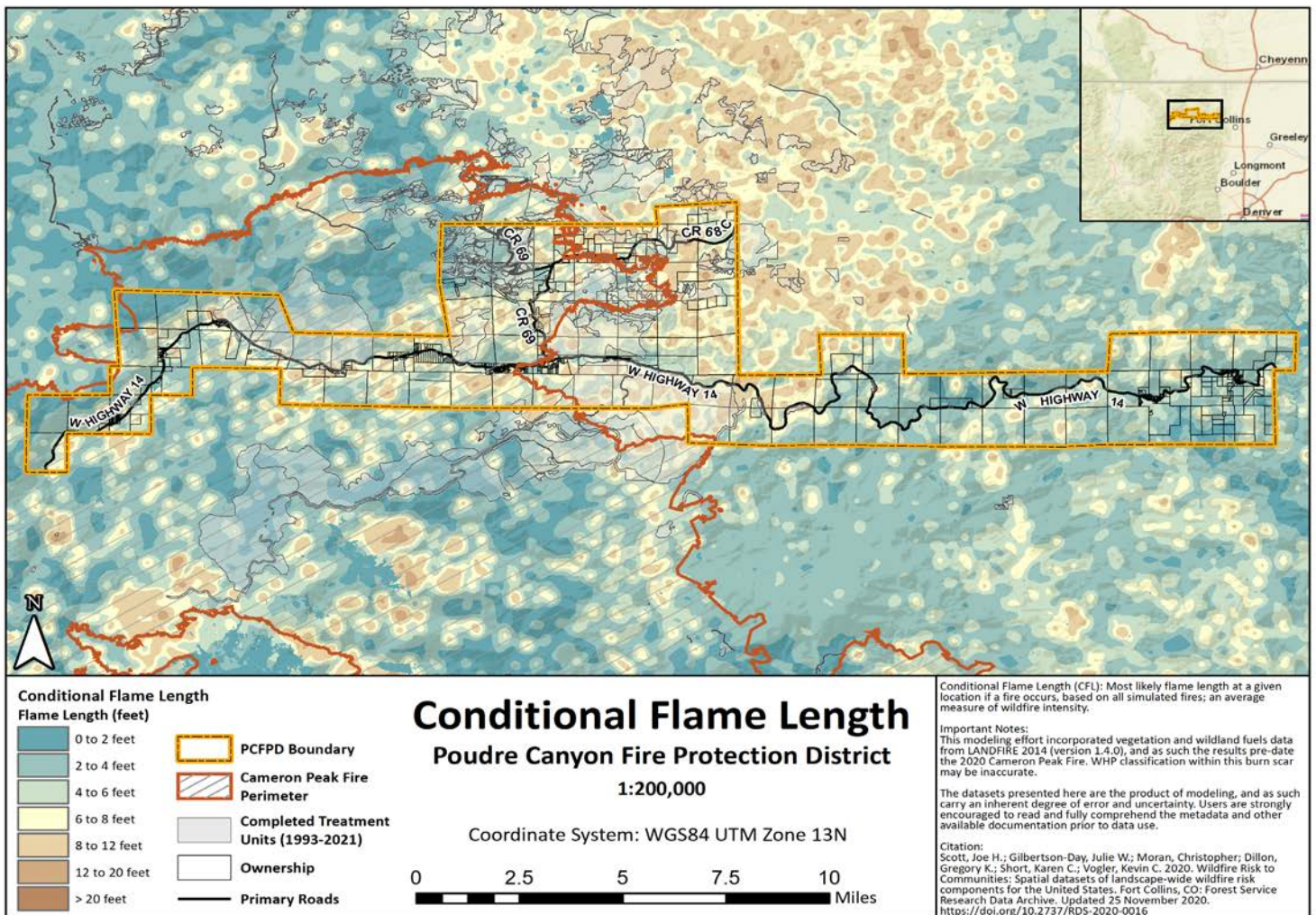
Fire behavior models also don't take into account structures like homes, sheds, and fences as fuel sources. These structures can actually contribute to the spread of a fire, especially when embers are produced. But because there isn't enough detailed information about each individual home's characteristics and the interaction between structures and vegetation during a wildfire, these models can't accurately predict fire behavior in areas with a lot of homes.

## Model Specifications and Inputs

Figure 4.f.b.1 depicts the fire behavior fuel models present across the PCFPD. Fuel models are a set of fuel bed characteristics used as input for a variety of wildfire modeling applications to predict fire behavior (Scott and Burgan 2005). Fuels in the land around PCFPD are primarily low- and moderate- grass-shrub and very high load timber-shrub fuels. In the maps of fire behavior predictions, certain areas like parking lots, roads, water bodies, and barren areas are considered "unburnable." Areas dominated by homes and buildings are labeled as "not modeled" because the models don't include structures as a fuel type. Instead, the models focus on the characteristics of the vegetation and fuel beds present in the area.

Figure 4.f.b.1  
Conditional Flame Length

Map by Ben Wasserstein



Create date: 3/24/2023; Imagery credits: ESRI; Layer credits: CDOT, CFRI, Larimer County, PCFPD, USFS Research Data Archive



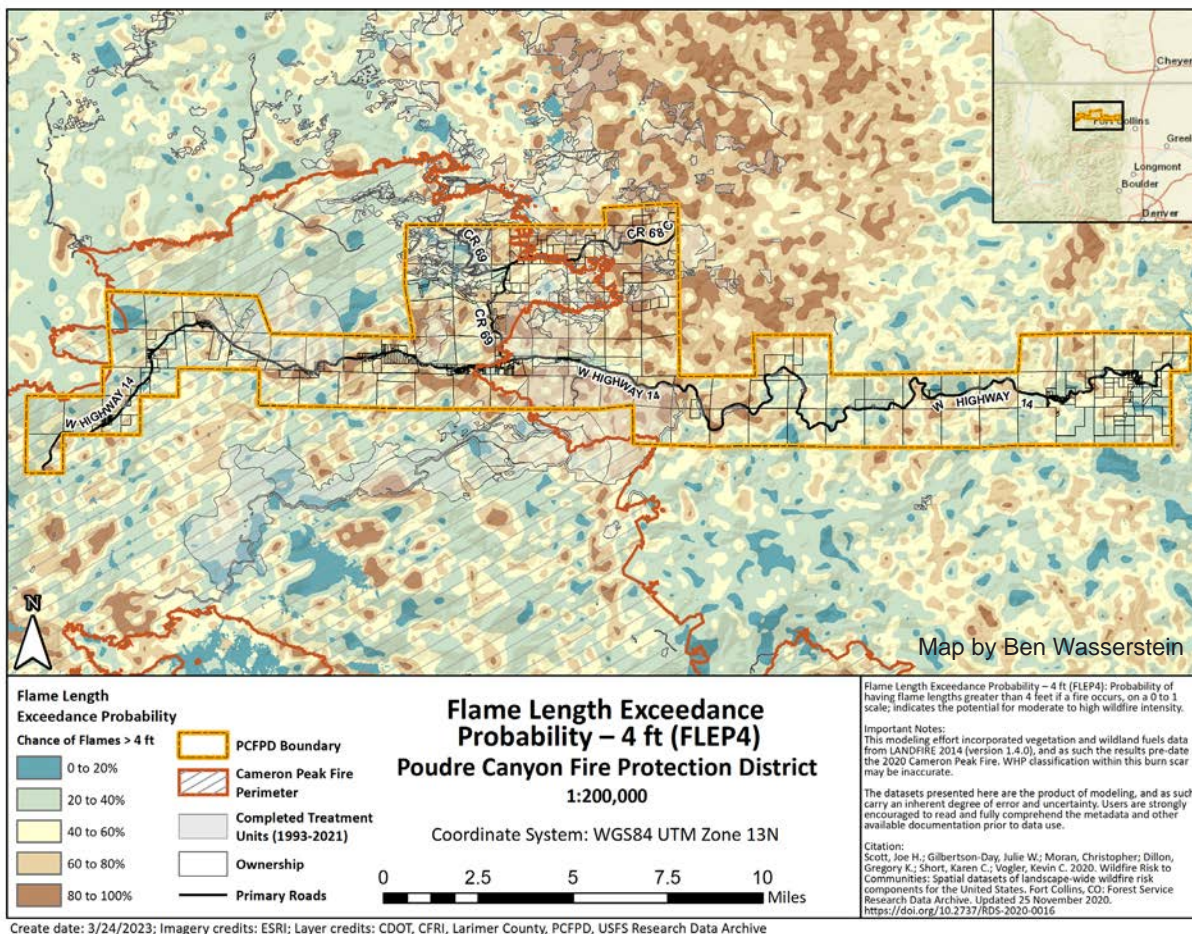
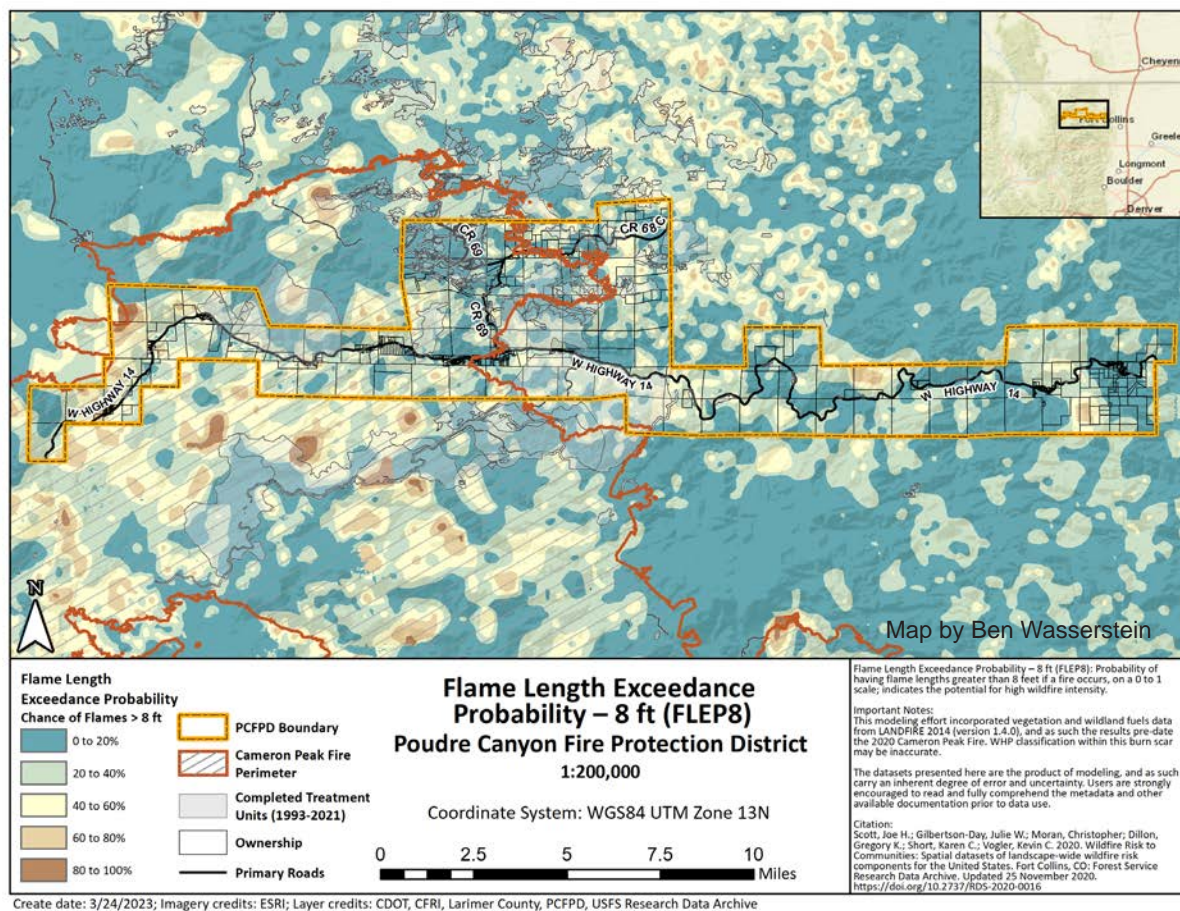
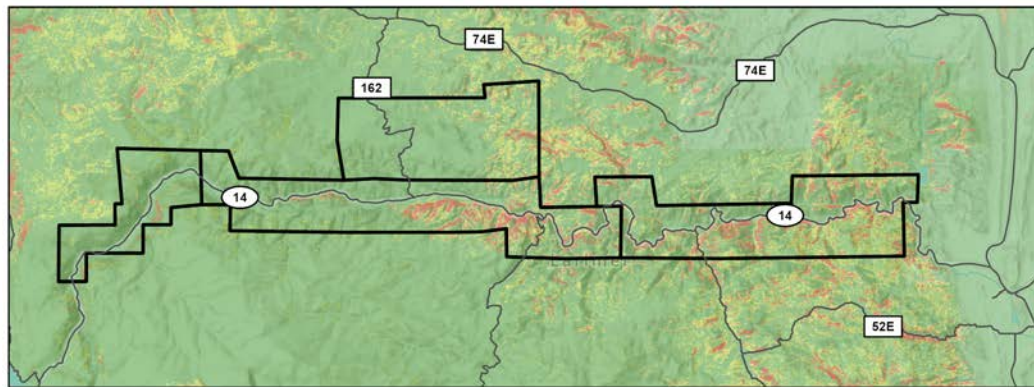


Figure 4.f.b.2  
Flame Length  
Exceedance  
Probability -  
4 ft

Figure  
4.f.b.3  
Flame Length  
Exceedance  
Probability -  
8 ft







0 5 10 Miles



Map by: Jackie Edinger, Colorado Forest Restoration Institute  
Datum/Projection: NAD 1983 UTM Zone 13N  
Data Sources: ESRI, USGS (highways), Colorado Forest Restoration Institute (Flame Length)

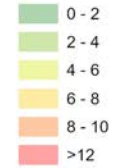


## Flame Length (Low Scenario)

□ Poudre Canyon FPD Subareas

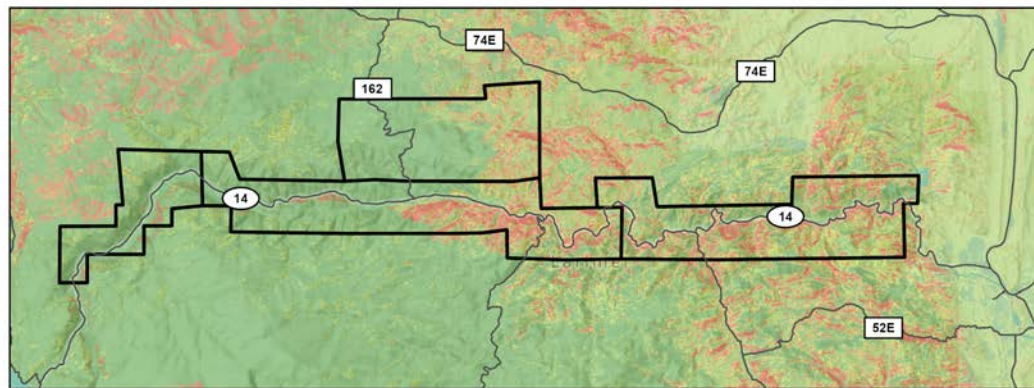
### Flamelength 25pct (feet)

Value



— Highways

Figure 4.f.b.4



0 5 10 Miles



Map by: Jackie Edinger, Colorado Forest Restoration Institute  
Datum/Projection: NAD 1983 UTM Zone 13N  
Data Sources: ESRI, USGS (highways), Colorado Forest Restoration Institute (Flame Length)

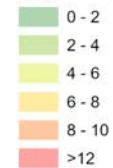


## Flame Length (Moderate Scenario)

□ Poudre Canyon FPD Subareas

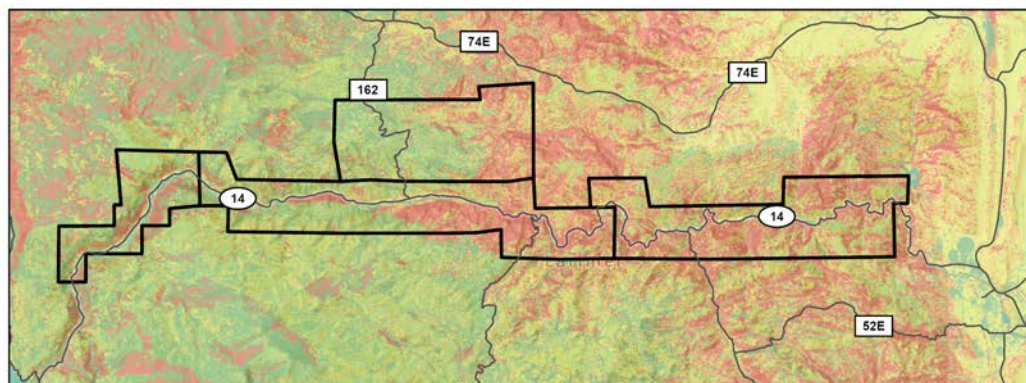
### Flamelength 50pct (feet)

Value



— Highways

Figure 4.f.b.5



0 5 10 Miles



Map by: Jackie Edinger, Colorado Forest Restoration Institute  
Datum/Projection: NAD 1983 UTM Zone 13N  
Data Sources: ESRI, USGS (highways), Colorado Forest Restoration Institute (Flame Length)



## Flame Length (High Scenario)

□ Poudre Canyon FPD Subareas

### Flamelength 90pct (feet)

Value



— Highways

Figure 4.f.b.6

**FYI - On these maps, red is bad, green is good.**



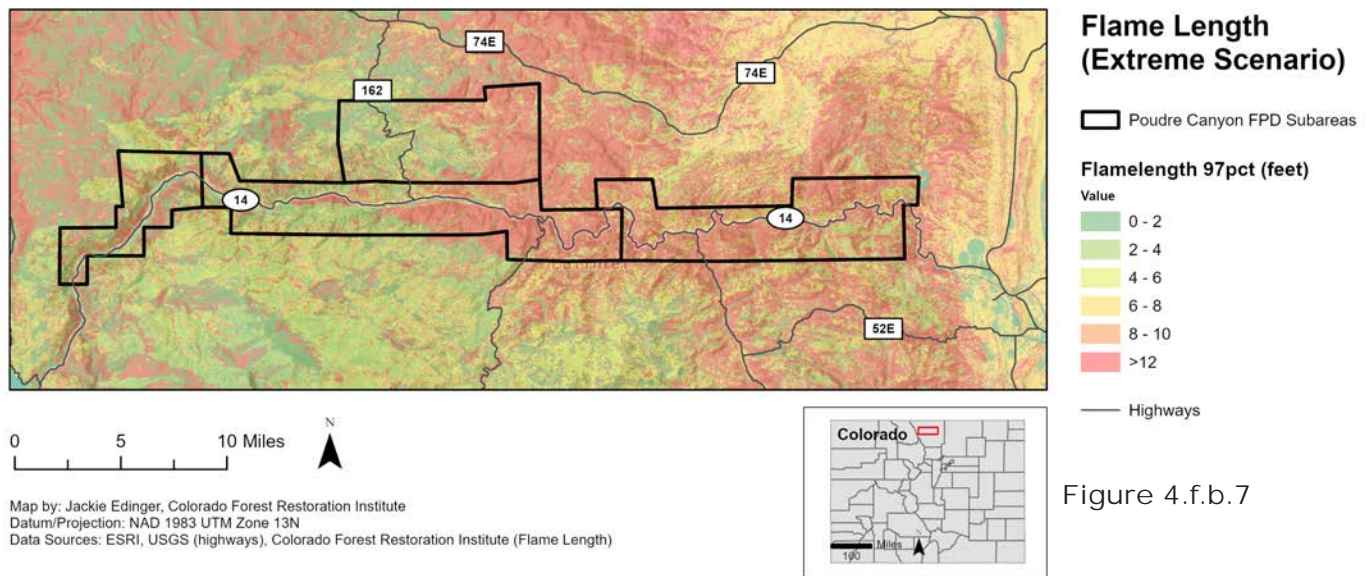


Figure 4.f.b.7

The mean flame length at a point, quantified as the mean flame length simulated with a Monte Carlo fire occurrence simulator. Flame length was modeled for four weather scenarios and files are labeled by percentile.

**Figure 4.f.b.4** Modeled flame length (ft) for the low fire weather scenario.

**Figure 4.f.b.5** Modeled flame length (ft) for the moderate fire weather scenario.

**Figure 4.f.b.6** Modeled flame length (ft) for the high fire weather scenario.

**Figure 4.f.b.7** Modeled flame length (ft) for the extreme fire weather scenario.

Flame length exceedance probability represents a threshold, where a 4 ft threshold is the point beyond which fire is considered too difficult to manually control. An 8 ft flame length approaches the threshold of survivability, for example, for cars on a road surrounded by 8 ft flame lengths.

Table 4.f.b.1 Description of Fire Behavior

Description of fire behavior and tactical interpretations for firefighters from the Haul Chart (NWCG 2019).

| Fire behavior class | Flame length (feet) | Rate of spread (chains*/hour) | Tactical interpretation      |
|---------------------|---------------------|-------------------------------|------------------------------|
| Very Low            | 0-1                 | 0-2                           | Direct attack with handcrews |
| Low                 | 1-4                 | 2-5                           | Direct attack with handcrews |
| Moderate            | 4-8                 | 5-20                          | Direct attack with equipment |
| High                | 8-11                | 20-50                         | Indirect attack              |
| Very High           | 11-25               | 50-150                        | Indirect attack              |
| Extreme             | 25+                 | 150+                          | Indirect attack              |

\*Note: 1 chain = 66 feet. Chains are commonly used in forestry and fire management as a measure of distance. Chains were used for measurements in the initial public land survey of the U.S. in the mid-1800s. 1 chain / hour = 1.1 feet / minute.



Structure protection during the  
Cameron Peak Fire.



## 5. Post Fire Risks

### 5.a. Flooding

A burn scar is the result of a significant wildfire, where intense burning and heat create a landscape in which the area is left without vegetation. This creates what is known as “hydrophobic” soil conditions, or a situation in which rain is not easily absorbed by the soil and instead runs off. In this setting, a normal thunderstorm that would not normally have a big impact can create a flash flood event, and this type of flooding can happen with little to no warning. In addition to flash flooding, following a wildfire there are also hazards known as mud or debris flows. In this situation, water picks up vegetation (such as fallen trees or shrubs), mud, sediment, ash, etc, and this type of flow can cause significant damage to homes and/or properties.

Following a catastrophic wildfire, as we saw here in Larimer County and around the state of Colorado in 2020, the intense heat leaves behind conditions where vegetation is burned away completely, and soil is heavily charred. The soil develops a layer, almost wax-like, that repels water, and this condition can last for several years. As a result, when it rains, the water is no longer absorbed into the soil and instead behaves similarly to water running across a sidewalk. This potentially leads to flooding or mudflows, even when rain is light. Flooding is a hazard that is very likely in Larimer County, however, the burn scar from the Cameron Peak Wildfire is over 200,000 acres, which increases this likelihood of post-fire flooding occurring significantly in Larimer County. Additionally, areas that typically experience high waters, particularly in the spring with run-off, such as rivers, streams, or tributary and properties located below or downstream from burn areas are at increased risk of flooding.

Results of the Black Hollow  
flood in 2021 where lives  
were lost.  
Photo by Paula Collins.





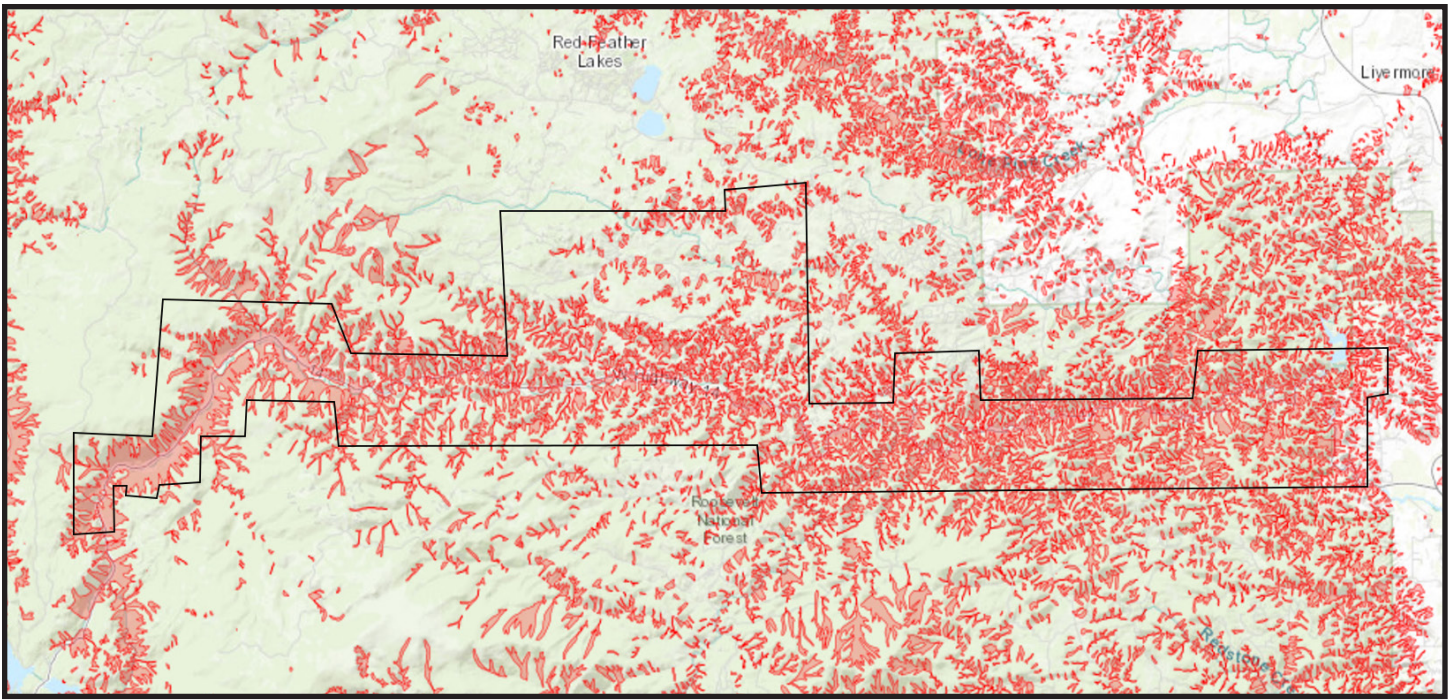


Figure 5.a.1 The above map of debris-flow is from Colorado Geological Survey with PCFPD boundary imposed over it. If you are located where the red shows up, then you are in an area prone to debris flow which is the majority of Poudre Canyon.

**1. KNOW YOUR RISK.** If you live downstream of a burn scar or near a stream or river, you are at risk for flooding, debris flows, or landslides. The most important first step you can do is inform yourself of the flood and hazard risk to your property.

**2. ENSURE YOU WILL BE WARNED.** The Emergency Alert System in Larimer County is called NoCoAlert. This is a free service for Larimer County community members and visitors. Register for NoCoAlert, please visit [www.nocoalert.org](http://www.nocoalert.org). Residents can download the [FEMA app](#) to sign up for emergency alerts.

**3. STAY AWARE.** Flash flooding maybe a risk in your location. Stay alert of your surroundings, and have a plan if you need to seek high ground quickly. Remember that banks of rivers and streams may be unstable and dangerous.

**4. MAKE A PLAN.** Make an emergency plan that is tailored to you and your family's unique needs.

**5. MAKE AN EMERGENCY KIT ("GO-KIT").** Create a kit organized around necessary supplies you will need in the event of an emergency if you have to leave your home quickly, See [Larimer County Emergency Preparedness Guide](#) or visit [www.ready.gov/kit](http://www.ready.gov/kit).

**6. OBTAIN FLOOD INSURANCE.** Keep in mind, if it can rain, it can flood. Most homeowner's insurance policies do not cover flooding.

**7. SAFEGUARD YOUR POSSESSIONS.** Take pictures of your property and keep copies of important documents on thumbdrives.

**8. PROTECT YOUR PROPERTY.** Elevate home and propety to higer levels. Clean gutters, consider using sandbags to divert water from your home. See more: [Flood Ready from Larimer County](#).



## Preparing for Flooding Before and After Wildfire

The PCFPD, which is located in the Cache la Poudre watershed, has experienced severe flooding impacts as a result of both the High Park and Cameron Peak fires. Nearly 165 miles of perennial stream and more than 340 miles of intermittent stream habitat were affected by the Cameron Peak Fire in the Cache La Poudre, Laramie, and Big Thompson watersheds (Fairchild 2020). Roads are also subject to erosion as a result of increased surface runoff following wildfires, and this runoff can increase road-stream connectivity (Sosa-Pérez and MacDonald 2017), eroding roads and sending sediment on a more direct path into a stream or river. Many roads and homes were affected by flooding in the Poudre Park area by the High Park Fire, and the 2013 flood a year after the fire caused catastrophic flooding and loss of life in downstream areas along the Front Range (Miller et al. 2017).

Sheep Creek in the upper Poudre Canyon floods onto a private road in July 2021. Photo by Maya Daurio.



The first summer after the Cameron Peak Fire, the Black Hollow Flood washed six homes into the river, killed four people (Blumhardt 2021), and decimated the trout population sixteen miles downstream of Black Hollow (England 2022). Two summers after the fire, numerous debris flows and flooding impacted properties throughout the upper Poudre Canyon and killed two people outside the district in Buckhorn Canyon (Gorman 2022).

In the aftermath of a wildfire, it can be difficult for residents to find critical information about flooding-related hazards or even to know if you and your property are at risk. There are several important resources available. They are introduced on the following pages.



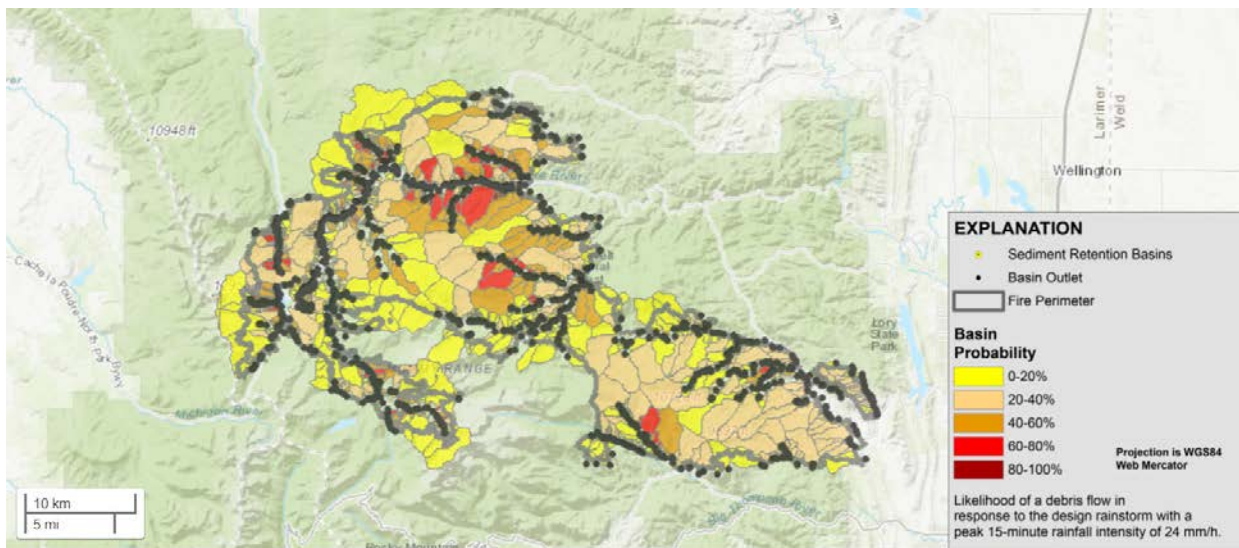


Figure 5.a.2 Map of the Cameron Peak Fire footprint showing likelihood of a debris flow by basin for the first year after the wildfire. Photo by USGS.

If you live downstream of a burn scar or near a stream or river, you are at risk for flooding, debris flows, or landslides. The USGS publishes a [debris flow hazard assessment](#) for areas impacted by wildfire, where residents can view potential debris flow risks to streams and drainages near them.

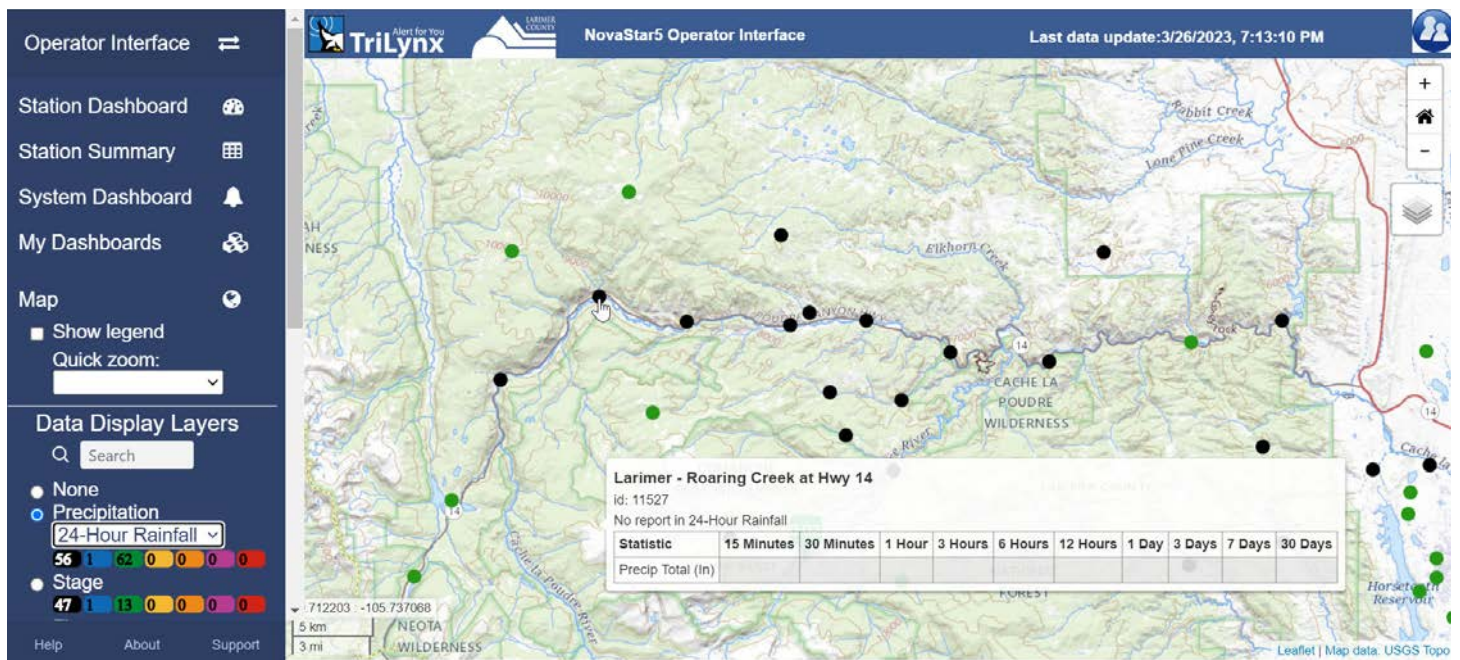


Figure 5.a.3 Novastar' photo by Larimer County. Larimer County's interactive NovaStar5 map displaying real-time environmental data which also serves as a flood warning system using precipitation and stream data.

Residents can view real-time precipitation data using the [Larimer County NovaStar dashboard](#).

After fires occur on Forest Service land, a Burned Area Emergency Response (BAER) team sometimes comprised of interagency representatives, conducts rapid assessments of risks to the watershed and recommends emergency response strategies (Miller et al. 2017). The BAER assessment for the Cameron Peak Fire is available to read [here](#).

Residents can also consult the Larimer County Office of Emergency Management [Cameron Peak Fire Risk Assessment](#), which includes structures, county, and private roads analyses of risk exposed by the fire. Multiple resources related to wildfire, flooding, and recovery can be accessed via [After the Flames](#).



Local governments and communities currently struggle to adequately forecast, prepare for, and respond to flooding events. There are often not enough field instruments nor are they geographically distributed in such a way to be able to respond to extreme events in a timely fashion (Chignell et al. 2015). One of the key elements in determining why and how debris flows occur is the rainfall rate, but this is hard to tell from using radar. Flooding forecasts for the public also rely on rainfall rates, which are best measured by nearby rain gauges. There aren't enough instruments up and down the Poudre Canyon to capture accurate, site-specific data, which are best measured by rain gauges. Gauges should be within four km of an incident to be useful for measuring rainfall and debris flows. Along with flooding and debris flows, there are a lot of geologic hazards in the Poudre Canyon that are difficult to predict, including, rock fall, rock avalanches, and landslides.

Access to more numerous and geographically distributed rainfall measurements in the PCFPD is important for emergency managers, scientists, and National Weather Service meteorologists to be able to accurately forecast flooding-related hazards and learn about extreme flooding events after they have occurred. One of the easiest and most effective ways for PCFPD community members to directly impact forecasting capacity is to participate in the [Community Collaborative Rain, Hail, & Snow Network](#) (CoCoRaHS). A low cost rain gauge can be [purchased](#) for under \$50, set up on private property, and then volunteers can submit local precipitation measurements to a publicly accessible [network](#) used by scientists and forecasters.

The PCFPD and its constituents in concert with emergency managers and scientists can also think about installing flood warning systems in specific locations in the Poudre Canyon in anticipation of certain future flooding hazards, as well as identifying values at risk before the next flood or debris flow. Because there is such a clear relationship between wildfire and flooding, wildfire risk assessments should also take into account hardening private property against flooding and identifying potential areas of greatest risk of flooding should wildfire occur.

# Flood After Fire



FEMA



Did you know wildfires dramatically alter the terrain and increase the risk of floods? Excessive amounts of rainfall can happen throughout the year. And properties directly affected by fires and those located below or downstream of burn areas are most at risk for flooding.

- 1 During normal conditions, vegetation helps absorb rainwater.
- 2 But after an intense wildfire, burned vegetation and charred soil form a water repellent layer, blocking water absorption.
- 3 During the next rainfall, water bounces off of the soil.
- 4 As a result, properties located below or downstream of the burn areas are at an increased risk for flooding.

## Degree of Land Slope

Higher degrees of land slope speed up water flow and increase flood risk.

## Flash Floods

Intense rainfall can flood low-lying areas in less than six hours. Flash floods roll boulders, tear out trees and destroy buildings and bridges.

## Mudflows

Rivers of liquid and flowing mud are caused by a combination of brush loss and subsequent heavy rains. Rapid snowmelt can also trigger mudflows.

Reduce your risk. The time to buy flood insurance is now. Contact your local insurance agent for more information or visit the National Flood Insurance Program at [FloodSmart.gov/wildfire](https://www.floodsmart.gov/wildfire).

FEMA Hazard Mitigation Plan requires many of the same elements as this Community Wildfire Protection Plan. PCFPD is a participating agency in [Larimer County's Hazard Mitigation Plan](#):

Beside wildfire PCFPD is at risk for floods, landslides, and winter storms.

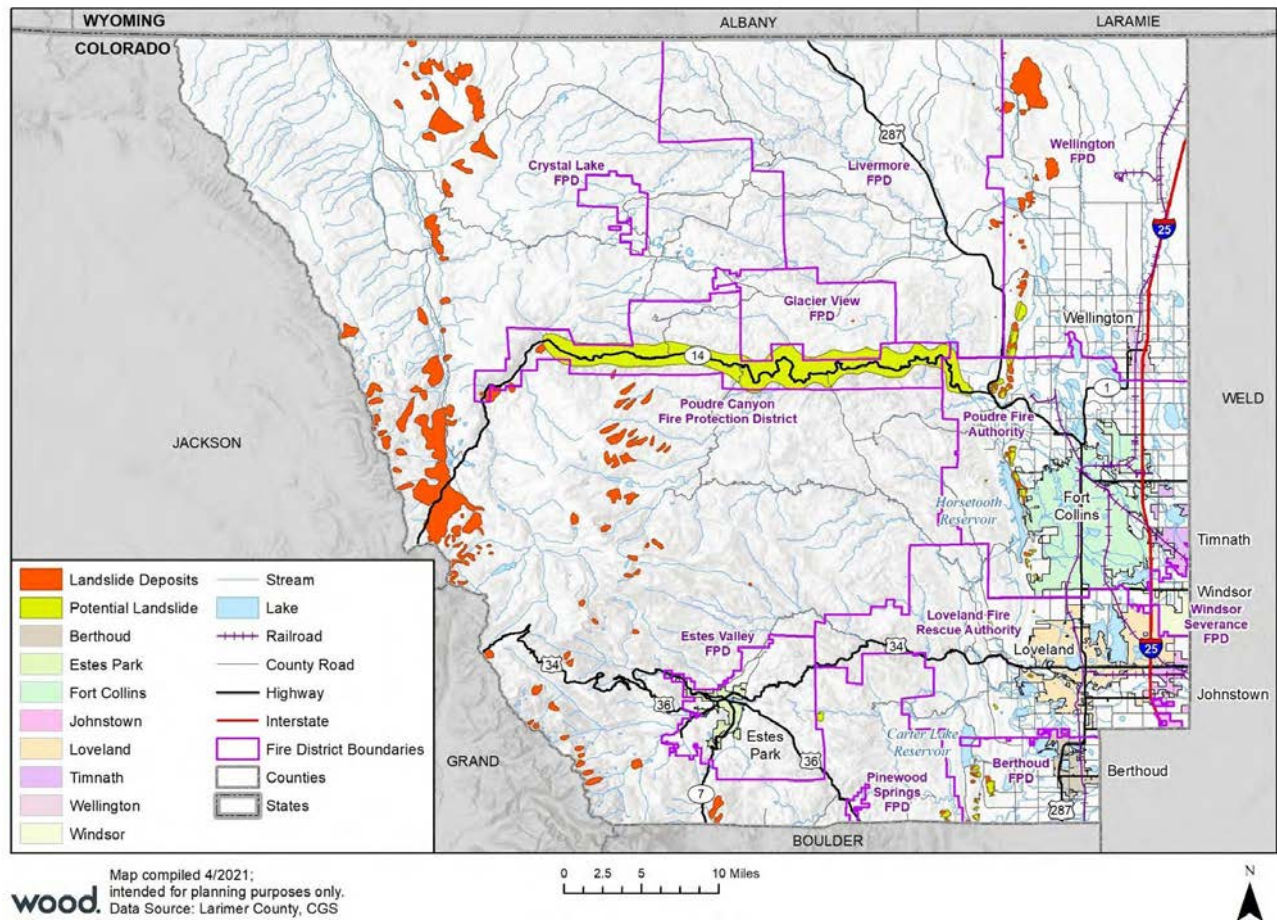
Here is how Larimer County summarized the risk for flooding:

- Flash flooding that occurs with little or no warning will continue to impact the planning area, and deficiencies in radar coverage are a concern for appropriate alert and warning.
- The town of Fort Collins and the Unincorporated Areas have significant and high flood risk; Estes Park, Loveland and Wellington have moderate risk.
- The intensity of storms contributing to flooding issues may increase due to climate change.
- Flooding may be exacerbated by other hazards, such as wildfires.
- Damages resulting from flood may impact tourism, which may have significant impacts on the local economy.
- Continued compliance with the NFIP and the promotion of flood insurance as a means of protecting private property owners from the economic impacts of frequent flood events should continue.

For more information check out [National Weather Service Post Wildfire Flash Flood and Debris Flow Guide](#).

The entire fish population in the Poudre River was wiped out from Black Hollow to Kelly Flats as a result of the 2021 Black Hollow flood.





## 5.b. Landslides

Here is how Larimer County summarized the risk for landslides:

- The central to western portion of the county is susceptible to the impacts of landslides and rockslides, especially in areas of steep slopes during high precipitation events in spring or summer.
- There have been 13 landslide/rockslide events between 2012 and 2020 resulting in road closures, road repairs, travel delays, and some home evacuations.
- There were six landslide/rockslide events that closed Highways 14 and 34 between 1989 and 2004.
- The total value of properties at risk to landslides and rockslides within Larimer County is over \$1.6 billion, not including utilities or roadways.
- Related hazards: spring/summer storms, earthquakes, wildfires.

Risk summary for winter storms:

- Winter storms often bring heavy snow and sometimes blizzard conditions to the County.
- In the past 23 years the County has experienced 504 winter storm events. There is effectively a 100% probability that a winter storm event will occur in a given year somewhere in the county.
- Winter storms have caused limited injuries and fatalities in the past 23 years.
- Heavy snow can lead to limited structural damage and damages to trees.
- Power outages are possible in severe winter storms. 8% of Medicare Beneficiaries in the County rely on equipment that is electricity dependent to be able to live independently in their homes.
- Related Hazards: Severe Wind, Utility Disruption

Figure 5.b.1. The above map is from the Larimer County Hazard Mitigation Plan. It shows potential landslides are possible all along Highway 14.

## 6. Conclusion

With 80% of the Poudre Canyon Fire Protection District owned by the USFS, it is important that this agency steps up to be a good neighbor and makes sure their property adjacent to private land is mitigated. Unfortunately, the USFS Black Diamond Project does not include most of PCFPD in its areas to be treated. The major roads in the district (ie. Highway 14, County Road 69 and County Road 68C) are designated to serve as Potential Operational Delineations (PODs). These roads should be given priority for mitigation by the USFS. This is important as these roads are evacuation routes for district residents and neighboring areas.

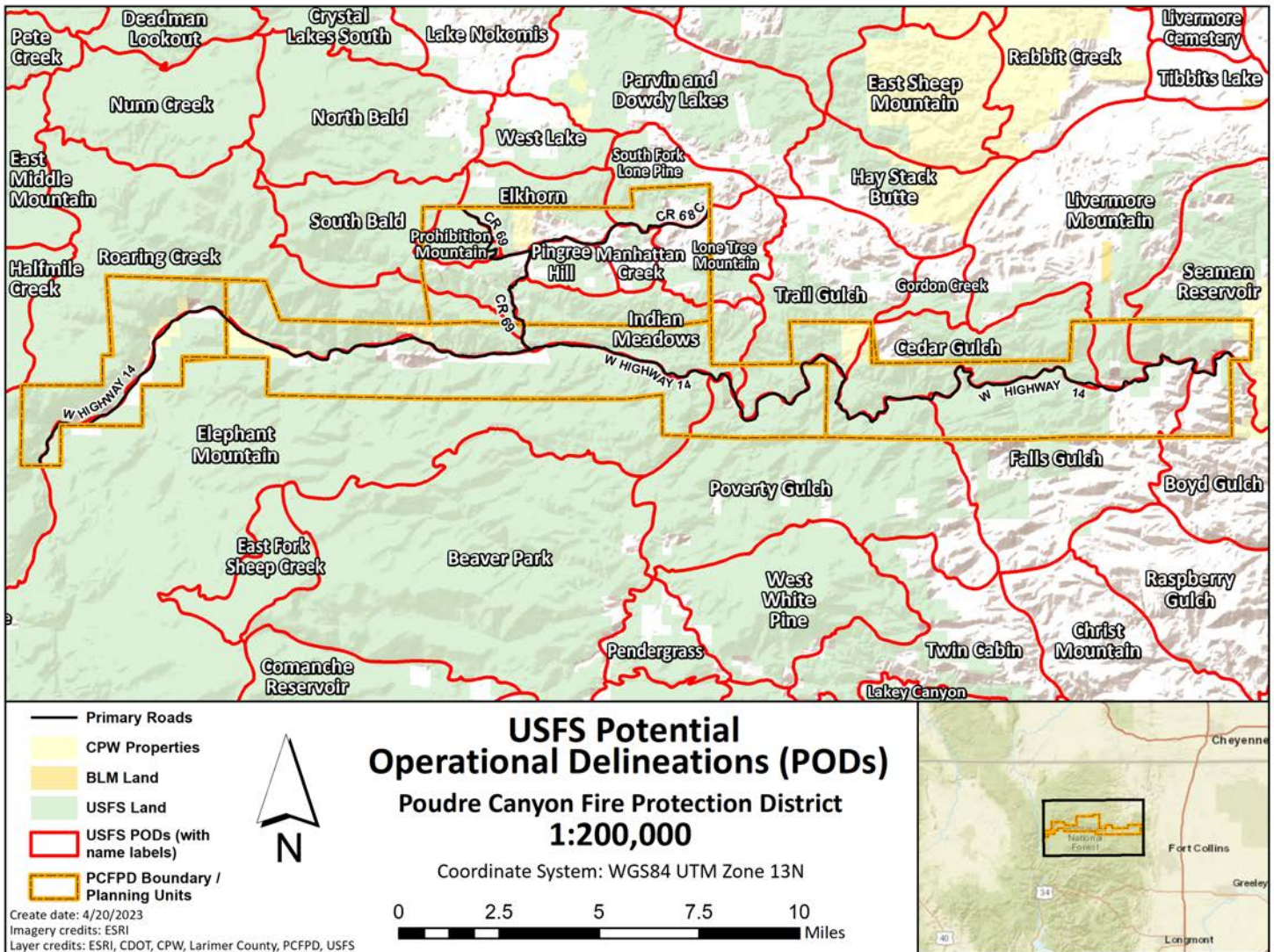


Figure 6.1. PODs that are established by the USFS in the PCFPD.

Another concern in the district is that the steep canyon walls limit the ways these areas can be mitigated. Much of the mitigation work will have to be done by hand crews. This CWPP has identified risk reduction project areas on pages 65-66. Page 72 identifies roads and driveways that need mitigation work.

There are several common themes throughout the district. First, homeowners need help mitigating around their property. Homes still standing after the Cameron Peak and High Park Fires are there because firefighters were able to protect them. Now, what is left



to burn are the areas around these homes. There is a good chance that there won't be any advance notice when the next fire roars through so mitigation around these houses needs to be brought up to "defensible space" standards.

The second theme is education of residents on the importance of doing mitigation on their property. This can be done in conjunction with creating demonstration sites in both the upper and lower canyon. Many residents are concerned about a neighbor who doesn't do any mitigation, so one-on-one dialog is necessary to see if we can help them overcome the barriers that are preventing them from mitigating their property.

As an all volunteer organization, the PCFPD does not have the staff to coordinate mitigation efforts, training events, or demonstration sites or conduct one-on-one meetings with residents. Funding of staff or contract labor to perform these duties would be necessary. The district has identified the need for an additional 2,000 gallon tender for lower canyon for fire protection, the need for repair and building of new dry wells in the upper canyon, and a XUV with a firefighting skid. The staff person could also write grants to acquire this equipment.

The residents repeatedly told us they are concerned about the folks recreating in the forest leaving their campfires burning. It seems we are producing a generation that does not have the basic understanding of how to be good stewards of the forests they are recreating in and enjoying. This can be documented by the increased numbers of calls the fire department and sheriff department go on to put out campfires that has been left unattended.

Fires aren't the only concern for PCFPD, post-fire flooding and rock slides are a concern as well. Thus the education of our residents should be about all of these hazards.

## 6.a. Implementation Activities and Responsibilities

| Short-term Actions  | Mid-Term Actions   | Long-Term Actions   |
|---|--|---|
| <ul style="list-style-type: none"> <li>• Can be implemented within the remainder of [2023].</li> <li>• Can be accomplished within the current funding capacity for the fire district and , and residents.</li> <li>• Can occur within the context of the current [FPD or partner organization] volunteer base, with modest expansion.</li> <li>• Can capitalize on current relationships with emergency response partners and land managers.</li> </ul> | <ul style="list-style-type: none"> <li>• Can be implemented within 18-24 months, generally in [2024 and 2025].</li> <li>• Will require expansion of the current [partner organization] volunteer base.</li> <li>• Requires new cooperative relationships with emergency response partners, land managers, and non-profit organizations.</li> <li>• Actions that are already in the planning stages and have some portion of funding already identified.</li> </ul> | <ul style="list-style-type: none"> <li>• Require planning to start within 18-24 months so implementation can occur after [2025].</li> <li>• Requires multi-year planning and funding.</li> <li>• Requires extensive grant funding.</li> <li>• Requires local staffing beyond volunteers.</li> </ul> |

| Recommendation  | Responsibility   | Timeline                |
|---|--|-------------------------|
| <b>Goal: Resilient and Fire Adapted Communities</b>   |  |                         |
| Adopt Fire Adapted and Resilient Communities as the vision for this CWPP.   | PCFPD, Upper and Lower Community Associations, residents | Short-term              |
| Residents participate in community activities and work to make sure their property is mitigated.  | Residents  | Short-term              |
| Recommendation  | Responsibility   | Timeline                |
| <b>Goal: District Capacity and Outreach</b>   |  |                         |
| Form a CWPP committee that will implement strategies to educate and follow through on items in this plan.   | PCFPD, Upper and Lower Community Associations, residents | Short-term              |
| Work with neighboring fire districts to establish a cooperative paid outreach or mitigation position to increase fire adapted communities capacity. | Local fire departments                                   | Long-term               |
| Recommendation  | Responsibility   | Timeline                |
| <b>Goal: Home Ignition Zone Mitigation</b>  |  |                         |
| Complete mitigation maintenance of your home each year, adding new mitigation project each year.  | Residents  | Short-term              |
| Conduct 20 home assessments for mitigation each year.   | PCFPD or CWPP committee                                  | Mid-term                |
| Recommendation  | Responsibility   | Timeline                |
| <b>Goal: Linked Defensible Spaces and Fuel Treatments</b>   |  |                         |
| Work with neighborhood groups to mitigate entire neighborhoods.   | Residents, CWPP Committee                                | Short-term              |
| Pursue grants to help homeowners and neighborhood groups build defensible spaces.   | PCFPD or CWPP committee<br>Neighboring fire departments  | Mid to long-term        |
| Recommendation  | Responsibility   | Timeline                |
| <b>Goal: Slash Management</b>   |  |                         |
| Continue to encourage residents to work with PCFPD to chip or burn slash piles.   | Residents, PCFPD   | Short-term to Long-term |
| Recommendation  | Responsibility   | Timeline                |
| <b>Goal: Evacuation Preparedness</b>  |  |                         |
| Develop a family evacuation plan and go-bags. Plans should include considerations of pets and livestock if applicable.                              | Residents  | Short-term              |
| Sign up for emergency notification through the [ex: NOCO Alert].  | Residents  | Short-term              |
| Recommendation  | Responsibility   | Timeline                |
| <b>Goal: Firefighter Access and Evacuation Safety</b>   |  |                         |
| Improve driveway access for firefighters  | Residents  | Mid-term                |
| Coordinate efforts to mitigate hazardous conditions along private roadways.   | Residents  | Mid-term to Long Term   |



## 7. Glossary

**20-foot wind speed:** The rate of sustained wind over a 10-minute period at 20 feet above the dominant vegetation. The wind adjustment factor to convert surface winds to 20-foot wind speeds depends on the type and density of surface fuels slowing down windspeeds closer to the ground (NWCG 2021).

**Active crown fire:** Fire in which a solid flame develops in the crowns of trees and advances from tree crown to tree crown independently of surface fire spread (NWCG 2018b).

**ArcCASPER:** An intelligent capacity-aware evacuation routing algorithm used in the geospatial information system mapping program ArcMap to model evacuation times and congestion based on roadway capacity, road speed, number of cars evacuating per address, and the relationship between roadways, congestion and reduction in travel speed (Shahabi and Wilson 2014).

**Basal area:** Cross sectional area of a tree measured at breast height (4.5 feet above the ground). Used as a method of measuring the density of a forest stand in units such as ft<sup>2</sup>/acre (USFS 2021b).

**Broadcast prescribed burning (aka, prescribed burn, controlled burn):** A wild-land fire originating from a planned ignition in accordance with applicable laws, policies, and regulations to meet specific objectives (NWCG 2018b).

**Canopy:** The more or less continuous cover of branches and foliage formed collectively by adjacent tree crowns (USFS 2021b).

**Canopy base height (CBH):** The average height from the ground to a forest stand's canopy bottom. CBH is the lowest height in a stand at which there is sufficient forest canopy fuel to propagate fire vertically into the canopy. Ladder fuels such as lichen, dead branches, and small trees are incorporated into measurements of CBH. Forests with lower canopy base heights have a higher risk of torching (NWCG 2019).

**Canopy cover:** The ground area covered by the crowns of all trees in an area as delimited by the vertical projection of their outermost crown perimeters (NWCG 2019).

**Canopy fuels:** The stratum of fuels containing the crowns of the tallest vegetation (living or dead), usually above 20 feet (NWCG 2018b).

**Canyon:** A long, deep, very steep-sided topographic feature primarily cut into bedrock and often with a perennial stream at the bottom (NRCS 2017).

**Chain:** Chains are commonly used in forestry and fire management as a measure of distance. 1 chain is equivalent to 66 feet. Chains were used for measurements in the initial public land survey of the U.S. in the mid-1800s.

**Chute:** A steep V-shaped drainage that is not as deep as a canyon but is steeper than a draw. Normal upslope air flow is funneled through a chute and increases in speed, causing upslope preheating from convective heat, thereby exacerbating fire behavior (NWCG 2008).

**Community Wildfire Protection Plan (CWPP):** A plan developed in the collaborative framework established by the Wildland Fire Leadership Council and agreed to by state, Tribal, and local governments, local fire departments, other stakeholders, and

federal land management agencies in the vicinity of the planning area. CWPPs identify and prioritize areas for hazardous fuel reduction treatments, recommend the types and methods of treatment on Federal and non-Federal land that will protect one or more at-risk communities and essential infrastructure, and recommend measures to reduce structural ignitability throughout the at-risk community. A CWPP may address issues such as wildfire response, hazard mitigation, community preparedness, and structure protection (NWCG 2018b).

**Conduction:** A type of heat transfer that occurs when objects of different temperatures contact each other directly and heat conducts from the warmer object to the cooler one until their temperatures equalize. During wildfires, flames in contact with a metal structure rapidly conduct heat into the rest of the structure. Wood is a poor conductor of heat, as illustrated by the fact that a wooden handle on a hot frying pan remains cool enough to be held by bare hands. Conduction has a limited effect on the spread of fires in wildland fuels.

**Convection:** A type of heat transfer that occurs when a fluid, such as air or a liquid, is heated and travels away from the source, carrying heat along with it. Air around and above a wildfire expands as it is heated, causing it to become less dense and rise into a hot convection column. Cooler air flows in to replace the rising gases, and in some cases, this inflow of air creates local winds that further fan the flames. Hot convective gases move up slope and dry out fuels ahead of the flaming front, lowering their ignition temperature and increasing their susceptibility to ignition and fire spread. Homes located at the top of a slope can become preheated by convective heat transfer. Convection columns from wildfires carry sparks and embers aloft.

**Crown (aka, tree crown):** Upper part of a tree, including the branches and foliage (USFS 2021b).

**Defensible space:** The area around a building where vegetation, debris, and other types of combustible fuels have been treated, cleared, or reduced to slow the spread of fire and reduce exposure to radiant heat and direct flame. It is encouraged that residents develop defensible space so that during a wildfire their home can stand alone without relying upon limited firefighter resources due to the great reduction in hazards they have undertaken. The Colorado State Forest Service defines three zones of defensible space: Zone 1 (0 to 30 feet from a home), Zone 2 (30 to 100 feet from a home), and Zone 3 (greater than 100 feet from a home). Some organizations further divide Zone 1 into Zone 1a (0 to 5 feet from a home) (CSFS 2021).

**Direct attack:** Any treatment applied directly to burning fuel such as wetting, smothering, or chemically quenching the fire or by physically separating the burning from unburned fuel (NWCG 2018b).

**Draws:** Topographic features created by a small, natural watercourse cutting into unconsolidated materials. Draws generally have a broader floor and more gently sloping sides than a ravine or gulch (NRCS 2017).

**Ecological restoration:** The process of assisting the recovery of an ecosystem that has been damaged, degraded, or destroyed (SER 2004). In ponderosa pine and dry mixed-conifer forests of the Colorado Front Range, ecological restoration involves transforming dense forests into a mosaic of single trees, clumps of trees, and meadows similar to historic forests that were maintained by wildfires and very resilient to them (Addington et al. 2018).



**Ember:** Small, hot, and carbonaceous particles. The term “firebrand” is also used to connote a small, hot, and carbonaceous particle that is airborne and carried for some distance in an airstream (Babrauskas, 2018).

**Ember cast:** The process of embers/firebrands/flaming sparks being transported downwind beyond the main fire and starting new spot fires and/or igniting structures. Short-range ember cast is when embers are carried by surface winds and long-range ember cast is when embers are carried high into the convection column and fall out downwind beyond the main fire. The number of embers reaching an area decreases exponentially with distance traveled, and the likelihood of structure ignition increases with the number of embers landing on receptive fuels (Caton et al., 2016). The distance used to differentiate short-range and long-range ember cast varies among sources. NWCG (2018b) classifies short-range ember cast as embers that travel less than 0.25 miles and long-range ember cast as embers that travel more than 0.25 miles, whereas Beverly et al., (2010) use a threshold of 0.06 miles. We use the Beverly et al., (2010) definition in this CWPP.

**Fire behavior:** The manner in which a fire reacts to the influences of fuel, weather, and topography. Characteristics of fire behavior include rate of spread, fire intensity, fire severity, and fire behavior category (NWCG 2018b).

**Fire history:** A general term referring to the historic fire occurrence in a specific geographic area (NWCG 2018b).

**Fire intensity (aka, fireline intensity):** (1) The product of the available heat of combustion per unit of ground and the rate of spread of the fire, interpreted as the heat released per unit of time for each unit length of fire edge, or (2) the rate of heat release per unit time per unit length of fire front (NWCG 2018b).

**Fire regime:** Description of the patterns of fire occurrences, frequency, size, and severity in a specific geographic area or ecosystem. A fire regime is a generalization based on fire histories at individual sites. Fire regimes can often be described as cycles because some parts of the histories usually get repeated, and the repetitions can be counted and measured, such as fire return interval (NWCG 2018b).

**Fire severity.** Degree to which a site has been altered or disrupted by fire; loosely, a product of fire intensity and residence time (NWCG 2018b). Fire severity is determined by visually inspecting or measuring the effects that wildfire has on soil, plants, fuel, and watersheds. Fire severity is often classified as low-severity (less than 20% of overstory trees killed) and high severity (more than 70% of overstory trees killed). Moderate-severity or intermediate fire severity falls between these two extremes (Agee 1996b). Specific cutoffs for fire severity classifications differ among researchers. For example, Sherriff et al. (2014) define high-severity fires as those killing more than 80% of overstory trees.

**Fire weather conditions:** Weather conditions that influence fire ignition, behavior, and suppression, for example, wind speed, wind direction, temperature, relative humidity, and fuel moisture (NWCG 2018b).

**Firebreak:** A natural or constructed barrier where all vegetation and organic matter have been removed down to bare mineral soil. Firebreaks are used to stop or slow wildfires or to provide a control line from which to work (NWCG 2018b; Bennett et al. 2010).

**FireFamilyPlus:** A software application that provides summaries of fire weather, fire danger, and climatology for one or more weather stations extracted from the National Interagency Fire Management Integrated Database (NWCG 2018b).

**Fireline:** (1) The part of a containment or control line that is scraped or dug to mineral soil, or (2) the area within or adjacent to the perimeter of an uncontrolled wildfire of any size in which action is being taken to control fire (NWCG 2018b).

**Flame length:** The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface). Flame length is measured on an angle when the flames are tilted due to effects of wind and slope. Flame length is an indicator of fire intensity (NWCG 2018b).

**FlamMap:** A fire analysis desktop application that can simulate potential fire behavior and spread under constant environmental conditions (weather and fuel moisture) (Finney 2006). FlamMap is one of the most common models used by land managers to assist with fuel treatment prioritization, and it is often used by fire behavior analysts during wildfire incidents.

**Flash Flooding:** Is the sudden, rapid flow of higher water sometimes in a normally dry area; other times in streams, creeks or rivers.

**Flood:** A temporary overflow of water onto land that is normally dry.

**Fuel model:** A stylized set of fuel bed characteristics used as input for a variety of wildfire modeling applications to predict fire behavior (Scott and Burgan 2005).

**Fuel reduction:** Manipulation, combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage from wildfires and resistance to control (NWCG 2018b).

**Fuelbreak:** A natural or manmade change in fuel characteristics which affects fire behavior so that fires burning into them can be more readily controlled. Fuelbreaks differ from firebreaks due to the continued presence of vegetation and organic soil. Trees in shaded fuelbreaks are thinned and pruned to reduce the fire potential but enough trees are retained to make a less favorable microclimate for surface fires (NWCG 2018b).

**Fuels mitigation / management:** The act or practice of controlling flammability and reducing resistance to control of wildland fuels through mechanical, chemical, biological, or manual means, or by fire, in support of land management objectives (NWCG 2018b).

**Fuels:** Any combustible material, most notably vegetation in the context of wildfires, but also including petroleum-based products, homes, and other man-made materials that might combust during a wildfire in the wildland-urban interface. Wildland fuels are described as 1-, 10-, 100-, and 1000-hour fuels. One-hour fuels are dead vegetation less than 0.25 inch in diameter (e.g., dead grass), ten-hour fuels are dead vegetation 0.25 inch to 1 inch in diameter (e.g., leaf litter and pine needles), one hundred-hour fuels are dead vegetation 1 inch to 3 inches in diameter (e.g., fine branches), and one thousand-hour fuels are dead vegetation 3 inches to 8 inches in diameter (e.g., large branches). Fuels with larger diameters have a smaller surface area to volume ratio and take more time to dry out or become wetter as relative humidity in the air changes (NWCG 2018b).



**Handcrews:** A number of individuals that have been organized and trained and are supervised principally for operational assignments on an incident (NWCG 2018b).

**Handline:** Fireline constructed with hand tools (NWCG 2018b).

**Hazards:** Any real or potential condition that can cause injury, illness, or death of personnel, or damage to, or loss of equipment or property (NWCG 2018b).

**Home hardening:** Steps taken to improve the chance of a home and other structures withstanding ignition by radiant and convective heat and direct contact with flames or embers. Home hardening involves reducing structure ignitability by changing building materials, installation techniques, and structural characteristics of a home (California Safe Council 2020). A home can never be made fireproof, but home hardening practices in conjunction with creating defensible space increases the chance that a home will survive a wildfire.

**Home ignition zone (HIZ):** The characteristics of a home and its immediate surroundings within 100 feet of structures. Conditions in the HIZ principally determine home ignition potential from radiant heat, convective heat, and embercast (NWCG 2018b).

**Ignition-resistant building materials:** Materials that resist ignition or sustained flaming combustion. Materials designated ignition-resistant have passed a standard test that evaluates flame spread on the material (Quarles 2019; Quarles and Pohl 2018).

**Incident Response Pocket Guide (IRPG):** Document that establishes standards for wildland fire incident response. The guide provides critical information on operational engagement, risk management, all hazard response, and aviation management. It provides a collection of best practices that have evolved over time within the wildland fire service (National Wildfire Coordinating Group 2018a).

**Indirect attack:** A method of suppression in which the control line is located some considerable distance away from the fire's active edge. Generally done in the case of a fast-spreading or high-intensity fire and to utilize natural or constructed firebreaks or fuelbreaks and favorable breaks in the topography. The intervening fuel is usually backfired; but occasionally the main fire is allowed to burn to the line, depending on conditions (NWCG 2018b).

**Initial attack:** An aggressive action to put the fire out by the first resources to arrive, consistent with firefighter and public safety and values to be protected (NWCG 2018b).

**Insurance Services Office (ISO) rating:** ISO ratings are provided to fire departments and insurance companies to reflect how prepared a community is for fires in terms of local fire department capacity, water supply, and other factors (see more information online at <https://www.isomitigation.com/ppc/fsrs/>).

**Interfluv:** the area between adjacent streams flowing in the same direction.

**Ladder fuels:** Fuels that provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees with relative ease. Ladder fuels help initiate torching and crowning and assure the continuation of crowning. Ladder fuels can include small trees, brush, and lower limbs of large trees (NWCG 2018b).

**LANDFIRE:** A national program spearheaded by the U.S. Department of the Interior and the U.S. Department of Agriculture to provide spatial products characterizing vegetation,

fuels, fire regimes, and disturbances across the entire United States. LANDFIRE products serve as standardized inputs for fire behavior modeling. More information about the program is available online at <https://www.landfire.gov/>.

**Lop-and-scatter:** Cutting (lopping) branches, tops, and unwanted boles into shorter lengths and spreading that debris evenly over the ground such that resultant logging debris will lie close to the ground (NWCG 2018b).

**Mastication:** A slash management technique that involves using a machine to grind, chop, or shred vegetation into small pieces that then become surface fuel (Jain et al. 2018).

**Mitigation actions:** Actions that are implemented to reduce or eliminate (mitigate) risks to persons, property, or natural resources. These actions can be undertaken before and during a wildfire. Actions before a fire include fuel treatments, vegetation modification in the home ignition zone, and structural changes to increase the chance a structure will survive a wildfire (aka, home hardening). Mitigation actions during a wildfire include mechanical and physical tasks, specific fire applications, and limited suppression actions, such as constructing firelines and creating “black lines” through the use of controlled burnouts to limit fire spread and behavior (NWCG 2018b).

**Mosaic landscape:** A heterogeneous area composed of different communities or a cluster of different ecosystems that are similar in function and origin in the landscape. It consists of ‘patches’ arranged in a ‘matrix’, where the patches are the different ecosystems and the matrix is how they are arranged over the land (Hansson and other 1995).

**Mudflow:** A flash flood becomes a mudflow when it becomes a combination of a river of moving water and flowing mud on the surface of normally dry land. These are common after fire due to the fact that there is vegetation loss. Additionally mudflows can happen after heavy rains or snow when water saturates the ground and results in long, thick movement of earth and liquid, such as during times of rapid snowmelt.

**National Wildfire Coordinating Group (NWCG):** An operational group established in 1976 through a Memorandum of Understanding between the U.S. Department of Agriculture and Department of the Interior to coordinate programs of the participating agencies to avoid wasteful duplication and to provide a means of constructively working together. NWCG provides a formalized system and agreed upon standards of training, equipment, aircraft, suppression priorities, and other operational areas. More information about NWCG is available online at <https://www.nwcg.gov/>.

**Noncombustible building materials:** Material of which no part will ignite or burn when subjected to fire or heat, even after exposure to moisture or the effects of age. Materials designated noncombustible have passed a standard test (Quarles 2019; Quarles and Pohl 2018).

**Non-survivable road:** Portions of roads adjacent to areas with predicted flame lengths greater than eight feet under severe fire weather conditions. Potentially non-survivable flame lengths start at eight feet according to the Haul Chart, which is a standard tool used by firefighters to relate flame lengths to tactical decisions (NWCG 2019). Drivers stopped or trapped on these roadways would have a low chance of surviving radiant heat from fires of this intensity. Non-survivable conditions are more common along roads that are lined with thick forests, particularly with trees that have limbs all the way to the ground and/or abundant saplings and seedlings.



**Overstory:** Layer of foliage in a forest canopy, particularly tall mature trees that rise above the shorter immature understory trees (USFS 2021b).

**Passive crown fire:** Fire that arises when surface fire ignites the crowns of trees or groups of trees (aka, torching). Torching trees reinforce the rate of spread, but passive crown fires travel along with surface fires. (NWCG 2018b).

**Pile burning:** Piling slash resulting from logging or fuel management activities into manageable piles that are subsequently burned during safe and approved burning conditions (NWCG 2018b).

**Radiation:** A method of heat transfer by short-wavelength energy through air (aka, infrared radiation). Surfaces that absorb radiant heat warm up and radiate additional short-wavelength energy themselves. Radiant heat is what you feel when sitting in front of a fireplace. Radiant heat preheats and dries fuels adjacent to the fire, which initiates combustion by lowering the fuel's ignition temperature. The amount of radiant heat received by fuels increases as the fire front approaches. Radiant heat is a major concern for the safety of wildland firefighters and can ignite homes without direct flame contact.

**Rate of spread:** The relative activity of a fire in extending its horizontal dimensions. It is expressed as rate of increase of the total perimeter of the fire, as rate of forward spread of the fire front, or as rate of increase in area, depending on the intended use of the information. Rate of spread is usually expressed in chains or acres per hour for a specific period in the fire's history (NWCG 2018b).

**Ravine:** Topographic features created by streams cutting into unconsolidated materials and that are narrow, steep-sided, and commonly V-shaped. Ravines are steeper than draws (NRCS 2017).

**Remote Automatic Weather Stations (RAWS):** A weather station that transmits weather observations via satellite to the Wildland Fire Management Information system (NWCG 2018b).

**Risk:** (1) The chance of fires starting as determined by the presence and activity of causative agents (e.g., lightning), (2) a chance of suffering harm or loss, or (3) a causative agent (NWCG 2018b).

**Roadway fuel treatment:** A natural or manmade change in fuel characteristics along a roadway which affects fire behavior so that fires burning into them can be more readily controlled. Survivable conditions with shorter flame lengths are more likely during a wildfire, and firefighter access is enhanced after proper roadway treatment (NWCG 2018b).

**Saddle:** A low point on a ridge or interfluvium, generally a divide or pass between the heads of streams flowing in opposite directions. The presence of a saddle funnels airflow and increases windspeed, thereby exacerbating fire behavior (NRCS 2017).

**Safety zones:** An area cleared of flammable materials used by firefighters for escape in the event the line is outflanked or spot fires outside the control line renders the line unsafe. If firing operations, crews progress so as to maintain a safety zone close at hand, allowing the fuels inside the control line to be consumed before going ahead. Safety zones may also be constructed as integral parts of fuelbreaks; they are greatly enlarged areas which can be used with relative safety by firefighters without the use of a fire shelter (NWCG 2018b).

**Shaded fuelbreak:** Fuel treatments in timbered areas where the trees on the break

are thinned and pruned to reduce fire potential yet enough trees are retained to make a less favorable microclimate for surface fires (NWCG 2018b).

**Slash:** Debris resulting from natural events such as wind, fire, or snow breakage or from human activities such as road construction, logging, pruning, thinning, or brush cutting. Slash includes logs, bark, branches, stumps, treetops, and broken understory trees or brush (NWCG 2018b).

**Smoldering combustion:** The combined processes of dehydration, pyrolysis, solid oxidation, and scattered flaming combustion and glowing combustion, which occur after the flaming combustion phase of a fire; often characterized by large amounts of smoke consisting mainly of tars (NWCG 2018b).

**Slope Failure:** A phenomenon where a slope collapses abruptly due to weakened self-retainability of the earth under the influence of a rainfall or an earthquake.

**Spot fire:** Fire ignited outside the perimeter of the main fire by an ember (NWCG 2018b). Spot fires are particularly concerning because they can form a new flaming front, move in unanticipated directions, trap firefighters between two fires, and require additional firefighting resources to control.

**Spotting:** Behavior of a fire producing sparks or embers that are carried by the wind and start new fires beyond the zone of direct ignition by the main fire (NWCG 2018b).

**Stand:** An area of forest that possesses sufficient uniformity in species composition, age, size, structural configuration, and spatial arrangement to be distinguishable from adjacent areas (USFS 2021b).

**Structure protection:** The protection of homes or other structures from an active wildland fire (NWCG 2018b).

**Structure triage:** The process of inspecting and classifying structures according to their defensibility or non-defensibility, based on fire behavior, location, construction, and adjacent fuels. Structure triage involves a rapid assessment of a dwelling and its immediate surroundings to determine its potential to escape damage by an approaching wildland fire. Triage factors include the fuels and vegetation in the yard and adjacent to the structure, roof environment, decking and siding materials, prevailing winds, topography, etc. (NWCG 2018b). There are four categories used during structure triage: (1) defensible – prep and hold, (2) defensible – stand alone, (3) non-defensible – prep and leave, and (4) non-defensible – rescue drive-by. The most important feature differentiating defensible and non-defensible structures is the presence of an adequate safety zone for firefighters (NWCG 2018a). Firefighters conduct structure triage and identify defensible homes during wildfire incidents. Categorization of homes are not pre-determined; triage decisions depend on fire behavior and wind speed due to their influence on the size of safety zones needed to keep firefighters safe.

**Suppression:** The work and activity used to extinguish or limit wildland fire spread (NWCG 2018b).

**Surface fire:** Fire that burns fuels on the ground, which include dead branches, leaves, and low vegetation (NWCG 2018b).



**Surface fuels:** Fuels lying on or near the ground, consisting of leaf and needle litter, dead branch material, downed logs, bark, tree cones, and low stature living plants (NWCG 2018b).

**Task book:** A document listing the performance requirements (competencies and behaviors) for a position in a format that allows for the evaluation of individual (trainee) performance to determine if an individual is qualified in the position. Successful performance of tasks, as observed and recorded by a qualified evaluator, will result in a recommendation to the trainee's home unit that the individual be certified in the position (NWCG 2018b).

**Torching:** The burning of the foliage of a single tree or a small group of trees from the bottom up. Torching is the type of fire behavior that occurs during passive crown fires and can initiate active crown fires if tree canopies are close to each other (NWCG 2018b).

**Values at risk:** Aspects of a community or natural area considered valuable by an individual or community that could be negatively impacted by a wildfire or wildfire operations. These values can vary by community and include diverse characteristics such as homes, specific structures, water supply, power grids, natural and cultural resources, community infrastructure, and other economic, environmental, and social values (NWCG 2018b).

**Watershed (aka, drainage basin or catchment):** An area of land where all precipitation falling in that area drains to the same location in a creek, stream, or river. Smaller watersheds come together to create basins that drain into bays and oceans (National Ocean Service 2021).

**Wildfire-resistant building materials:** A general term used to describe a material and design feature that can reduce the vulnerability of a building to ignition from wind-blown embers or other wildfire exposures (Quarles 2019; Quarles and Pohl 2018).

**Wildland-urban interface (WUI):** Any area where the built environment meets wildfire-prone areas—places where wildland fire can move between natural vegetation and the built environment and result in negative impacts on the community (Forge 2018).

## 8. Acronyms

**BAER** - Burne Area Emergence Response (USFS)

**BDSR** - Ben Delatour Scout Ranch

**BLS** - Basic Life Support

**BSA** - Boy Scouts of America

**CDOT** - Colorado Department of Transportation

**CoCoRaHS** - Community Collaborative Rain, Hail and Snow

**cNVC** - Conditional/net Value Change

**CPRW** - Coalition for the Poudre River Watershed

**CPW** - Colorado Parks & Wildlife

**CSFS** - Colorado State Forest Service

**CSU** - Colorado State University

**CWPP** - Community Wildfire Protection Plan

**DFPC** - Division of Fire Prevention and Control

**eNVC** - Expected Net Value Change

**EUV** - Extreme Utility Vehicle

**EQIP** - Environmental Quality Incentives Program

**FAC** - Fire Adapted Community

**FEMA** - Federal Emergency Management Agency

**FR** - Forest Road

**GVFPD** - Glacier View Fire Protection District

**HIZ** - Home Ignition Zone

**HOA** - Homeowner's Association

**HVRA** - High Value Resources or Assets

**IIBHS** - Insurance Institute for Business & Home Safety

**IRPG** - Incident Response Pocket Guide

**ISO** - Insurance Services Office

**LCCC** - Larimer County Conservation Corps

**LCCD** - Larimer County Conservation District

**LCOEM** - Larimer County Office of Emergency Management

**LCSO** - Larimer County Sherriff's Office

**LCSO ES** - Larimer County Sherriff's Office Emergency Services

**LPCA** - Lower Poudre Canyon Association

**NCFC** - Northern Colorado Fireshed Collaborative

**NFIP** - National Flood Insurance Program

**NFPA** - National Fire Protection Association

**NWCG** - National Wildfire Coordinating Group

**NYLT** - National Youth Leadership Training

**QWRA** - Quantative Wildfire Risk Assessment

**PCFPD** - Poudre Canyon Fire Protection District

**PODs** - Potential Operational Delineations

**RAWS** - Remote Automatic Weather Stations

**SEAT** - Single Engine Air Tanker

**TEA** - The Ember Alliance

**UPCA** - Upper Poudre Canyon Association

**USFS** - U.S. Forest Service

**WUI** - Wildland-Urban Interface

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# CORE TEAM FOR UPDATING POUDRE CANYON COMMUNITY WILDFIRE PROTECTION PLAN, 2023



## Colorado State Forest Service

The mission of the Colorado State Forest Service is to achieve stewardship of Colorado's diverse forest environments for the benefit of present and future generations. The Colorado State Forest Service provides technical forestry

assistance, wildfire mitigation expertise and outreach and education to help landowners and communities achieve their forest management goals.

Established in 1955, the Colorado State Forest Service (CSFS) is a service and outreach agency of the Warner College of Natural Resources at Colorado State University. Headquartered in Fort Collins, the agency provides staffing for the Division of Forestry within the Colorado Department of Natural Resources.

The CSFS is committed to providing timely, relevant forestry information and education to the citizens of Colorado to achieve resilient forests and communities. Using applied science, CSFS has adapted our focus and approach throughout the decades in response to emerging forestry issues.

As the lead state agency for providing forest stewardship and management, fuels reduction and wildfire mitigation assistance, CSFS offer a variety of programs and services:

- Forest and timber management for forest health and restoration
- Fuels mitigation resources and fuels reduction projects to reduce wildfire risk
- Insect and disease surveys and detection
- Urban and community forestry assistance for homeowners and municipalities
- Guidance in obtaining grants and grant administration
- Trees and shrubs for conservation, tree planting plans and seedling tree advice
- Workshops for forest landowners, communities and homeowner associations
- Outreach and education for adults and youth

CSFS works closely with state, federal, county, and other key partners and land managers to plan and implement forestry projects across ownership boundaries to achieve landscape-scale benefits.

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Colorado State Forest Service  
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## Larimer County Sheriff's Office Emergency Services

The Larimer County Sheriff's Office Emergency Services Unit (LCSOES) provides wildland fire suppression, mitigation, and education services to the citizens of Larimer County. They also work with the County Building and Planning Departments to provide Home Ignition Zone inspections for new construction and assist fire departments with reviews when requested. LCSOES has a full-time Initial Attack Module that works on fuel mitigation projects when not fighting fires and is a resource for communities with Community Wildfire Protection Plans (CWPP), as funding and commitments to ongoing projects allow. CWPPs require

County representation on the Core Team, and as the subject matter experts on wildland fire for the County, LCSOES provides input and guidance in cooperation with other Core Team members.

Derek Rosenquist  
Sergeant, Emergency Services Unit  
(970) 498-5301



## Larimer Conservation District

The Larimer Conservation District's (LCD) Forestry Program works to bring technical expertise, funding, and project management to forest restoration projects in Larimer County. They work with private landowners, partnering organizations, and logging contractors to plan and implement projects utilizing the best-available science. The goals of LCD's forestry projects are to reduce the risk of wildfire, improve wildlife habitat, and enhance forest health and resilience.

Gretchen Reuning, Director Natural Resource Program  
and Matt Marshall, Director of Forestry  
Larimer Conservation District  
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[larimercd.org](http://larimercd.org)



## Coalition for the Poudre River Watershed

The Coalition for the Poudre River Watershed (CPRW) is a local 501(c)3 nonprofit organization based in Fort Collins, with a mission to improve and maintain the health of the Poudre River Watershed through community collaboration. CPRW was formed after the High Park Fire in 2012 and the Front Range flooding in 2013, and works on watershed planning, river restoration, forest health, and post-fire restoration by collaborating with our many local, state, federal, and non-governmental partners. CPRW's website is [poudrewatershed.org](http://poudrewatershed.org), and has information on each of PCFPD focus areas and descriptions of many of PCFPD projects.

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## Poudre Canyon Fire Protection District

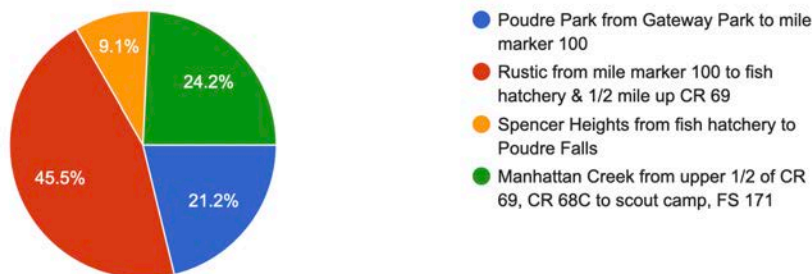
Formed in 1959, the Poudre Canyon Fire Protection District provides fire and EMS services to 90 square miles along Highway 14 and up CR 69 and along CR 68C. The district has four stations spread throughout the district at Poudre Park, Rustic, Spencer Heights and Manhattan Creek. Volunteers for the district help residents burn and chip slash piles. They encourage residents to mitigate and harden their property from fires and flood with the goal to have a resilient district.

Hugh Collins, Chief, (970) 881-2472  
Bette Blinde, Assistant Chief, (970) 881-2902  
[poudrecanyonfiredistrict.org](http://poudrecanyonfiredistrict.org)

# PCFPD Community Wildfire Protection Plan Survey Results

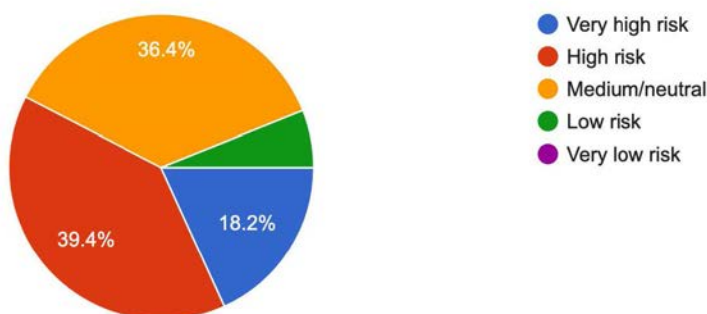
## 1. What part of the district do you live in?

33 responses



## 2. What do you think your risk is from wildfires in your area?

33 responses



## 3. What are your concerns about wildfires on your property? For example, not enough defensible space around my house, my house will burn too quickly, too many trees along my driveway making it hard to get out during a fire, etc.

- Need to thin along driveway.
- Deadfall in the woods immediately surrounding my property.
- Have trees next to house.
- Shrub and tree vegetation growth in very close proximity to house
- Large trees.
- Wood frame house with wood siding and shingle roofing.
- That someone else's PILES of unchipped Brush in Poudre Park will spread & take out my House, Garage also when it starts a fire. We have cut down 11 Trees on our Property, Mow the Brush on the hill & the lawn area & weed eat all needed areas! Not much more we can do I'm thinking.
- Everything around here has already burned, so I'm not terribly worried.
- New home in last 3 years ...required us to have a 100 ft clear defensible space and another 100 + of low hanging branches.
- My concerns are minimal...although realistic. I live in the mountains, not on a flat open area with no trees. There is somewhat of a risk/gamble living in the mountains.
- Defense requires equipment that I do not have, such as water tubs, pumps, and sprayers.
- It's a summer recreational use cabin and we are 1500 miles away.

We are protected on 1 side with the river and have a rock driveway around us. Also have a steel



roof and the last fire came pretty close. So we would have to have a pretty heavy up can blow to affect our location. That said, anything is possible.

- Surrounding in properties with low levels of mitigation.
- Scout Camp protection of assets and members on site; evacuation routes, etc.
- Neighbors' bushes too close to my house which is on the property line.
- We survived the Cameron Peak fire, only because of our previous mitigation efforts and the Wildfire structure protection crews. We were evacuated for 73 days!
- Trees close to my house.
- I have enough defensible space.
- Since our house burned to the ground and most of our property was burned to a cinder, I believe we are at low risk for wildfire in the foreseeable future. In addition, our new build is in an open area and extremely defensible and any future landscaping will certainly take mitigation into consideration.
- Not overly concerned due to the mitigation I have already done-trimming trees, removing vegetation near the house, etc. We have one ponderosa right next to the house between the house and the river. I have trimmed it but decided not to remove it.
- Around our house it is pretty well mitigated, and we have two egress routes even though we are a mile and a quarter off the county road. During the Cameron Peak fire, our two track around the property turned into a dozer line and back burning was done by our firefighter heroes to create a fire break as the fire approached. We probably lost 100 trees in the process, but our house survived while our neighbor's did not. We do have a densely forested area that could easily fuel another fire, however located within our firebreak. Many need pruning and there are ladder fuels that need to be removed. We were lucky in 2020.
- Our property almost entirely burned in the Cameron Peak Fire, and we have a new house around which we're creating defensible space. We have one bridge on and off property, and one of my concerns is whether this is a barrier for firefighters in choosing which properties to defend. Also concerned about possibility of bridge burning. And future wildfire potential when all the dead standing burned trees fall to the ground and create fuel, both on our land and adjoining Forest Service land.
- Hilly terrain with little road access making firefighting difficult.
- Risk is lower now after much of the area burned, but biggest concern is a large fire front coming through the area from outside the immediate Rustic vicinity. A big problem is getting rid of slash when you create defensible space, nowhere to take it is evident.
- Extreme wildfire conditions over-ride existing mitigation.
- We purchased our home knowing the concern for wildfire in this area, it's part of living here.
- Defensible space around house.
- Defensible space concerns around buildings.
- Steepness of mountain behind house.
- Clearing standing dead trees and getting rid of slash piles.
- Campers near by on manhattan and the need for more monitoring, see people camping that don't seem to have a cautious approach
- A few years back there was a Prescribed Burn on the Ben Delatour Scout

Ranch that got out of control and posed a very real threat to the neighboring Drala Mountain Center property. I am not certain how accurate the information that I received is but my understanding is those in charge of the task were a private contractor and may not have had the necessary experience to implement it with the utmost safety. I firmly believe in the benefit of prescribed burns as a method of wildfire mitigation and that they cannot necessarily be “controlled”. When the very thing that is supposed to protect us becomes a threat in itself there are understandable concerns and apprehension around future plans for this as well as during them. Another concern is that the community we live in is about 80% public land (National Forest) and 20% private land. When people come here from outside of the area they often seem to lack awareness of current Fire Restrictions and/or basic Wildfire safety measures. As an example gunfire can be heard coming from public land on a regular basis when the current fire restrictions clearly state that it is not allowed. I have even had people approach me asking where a good place for them to go shooting is during the ban. When I inform them they are always grateful because they did not know. It is hard to provide a precise location to where the shooting is coming from to local authorities because of how sound travels in the area. Even if the shooting occurs close by it is often unnerving to approach a stranger with a gun and ask them to cease what they are doing and threaten to call the authorities. ATV’s without proper skid plates pose more of a risk than most people are aware of. I am not aware of the laws in our county requiring proper protection or if random inspections are done but do believe that this would be helpful. I think this comes down to people simply not being aware and to efficiently communicate it to them. I personally have experienced that no matter how signs are posted, many will either not read them or actually read them and choose to ignore it.

#### **4. What are the barriers for you to do wildfire mitigation on your property?**

**For example, it is too costly, you are not physically able to do the work, etc.**

- None.
- Dealing with material removed.
- Time. Could use more help chipping slash piles.
- Physically not able.
- Cost of removal and disposal of vegetation growth.
- None.
- No barriers. Annual mitigation maintained.
- Chipping Brush As we do not have a chipper and are in our 70's.
- Our property is fairly well mitigated already.
- It has been costly.
- Lack of area to burn slash; lack of chipper.
- See above.
- We do not have any?
- Both of those.
- Backcountry access, chipper and crew, no market for materials.
- None really.
- We have done lots of mitigation work around our home, however we now have several large, dead, burned trees that we are incapable of cutting down and removing or chipping. We are concerned about them falling down and injuring

visitors or our structures.

- Mitigation might damage the value/curb appeal/ rustic appeal of my home.
- Unable to do because of my age.
- For now, nothing. In future, might be cost or availability of labor to complete the work necessary.
- We are senior citizens. We are only able to deal with probably one tree a week in the denser areas: felling it, cutting it in lengths, hauling it by Gator, splitting it for firewood, piling the slash, and waiting for the day to burn the slash piles. one tank of gas in the chainsaw is all we can handle before our backs and leg muscles complain and we know it will take another couple days to recuperate. Being older, weaker and cautious about tripping and falling and at a higher risk for heart attacks and strokes, we work at a slow pace. On a fixed income, we have opted to not hire others to do the work and cross our fingers that lightning doesn't strike there.
- Cost, manpower, skill and safety (felling burned snags). Also, my property's proximity to Forest Service land means that it's not just about what gets done on my property but also on the surrounding federal land which has consequences for how wildfire and flooding plays out on private property.
- Hilly terrain, so it is too costly, and I am not physically able to do the work.
- Lack of places to get rid of slash.
- Cost and time to do the work myself.
- We are in Poudre Park and have a small lot, this is not an issue for us
- Too costly.
- Lack of understanding and/or interest in wildfire mitigation, what is needed, what can be done, labor, management, cost, lack of short and long term plan. Continuity.
- Not physically able to do work.
- Cost, needing help and equipment to mitigate. It's an overwhelming task.
- Too much land for the money or time available.
- The Eco-Forestry Work done on our land in 2018 and the bravery of local Firefighters the majority of our land and structures were spared during the Cameron Peak Fire. When the Eco-Forestry work was first underway there was a lot of pushback in our community due to a lack of understanding. It wasn't until the Cameron Peak Fire that some peoples perception of that work changed. It is hard for some people to wrap their heads around the importance of mitigation efforts until they have experienced the devastation first hand. The barrier seems to mostly be proper knowledge or understanding as to why mitigation efforts and adherence to fire bans are not optional but a necessary requirement.

## **5. What are three things you see as strengths in your community regarding wildfire issues?**

- Survived Cameron Peak.
- Volunteer fire department. Subsidies for felling trees. Strong sense of community.
- Best fire department.
- Very prompt and effective USDA forest fire response and mitigation resources. Active rural fire fighting resources in close proximity to property.
- Group effort. Excellent volunteer firefighters.
- Fire awareness, mitigation, good communication.



- Some neighbors HAVE done Mitigation since High Park Fire .!
- Community alertness good people on the team.
- Close knit group .. most properties are clean .
- Unity.
- Coordination among agencies and individuals, experience, equipment at hand.
- Good notification system, community support, community awareness.
- River, Road, and currently burned area.
- Your education programs, dedication of vounteers and regular communication with residents.
- Willingness to thin the forest for forest health; strong history of education about mitigation; thinning.
- Efforts since 1986 to reduce our forest fuels load.
- Our fire department is very approachable and helpful, we were in direct fire area but our buildings were saved by firefighters, my location off the road.
- #1 The community is very tight knit, willing to help one another when needed.
- #2 Our Volunteer fire fighters are highly trained and willing to learn new skills.
- #3 The community supports the Volunteers with donations and respect.
- Well funded, staffed, and trained fire staff. Close fire houses and heliport. Close water source/river and a paved primary road (Highway 14).
- Vol firefighters, mitigation ideas. excellent response to fires in past.
- Knowledge, much of which comes from having had two major wildfires in the area over the past 10years. Wide range of resources, from Forest Service, Watershed Coalition, Ember Alliance, CSU Extension Service and county management. Media does a good job of reporting on the issues.
- 1. Poudre Canyon Fire Department 2. Area near the community has already been burned. 3. Close knit community where we all help each other.
- Much of our community lies close to the Poudre River, a reliable source of water. It's like having a fire hydrant out your back door. The fuel load has been reduced in the district due to the Cameron Peak Fire 2020, High Park Fire 2012, and prescribed burns by the forest service. We have strong mutual aide response/ support from our neighboring fire departments.
- General awareness of wildfire and subsequent flood risk, widespread firewise landscaping practices, active fire district facilitating funding of wildfire mitigation
- Common purpose, good communication, and ?
- Good Fire department, current level of attention to wildland fire issues, good community support.
- Local FD within 5 miles with experience, good community communication.
- The Fire Station is next door & residents know how to prepare.
- Willingness to work on issue, available resources, working on plan of attack.
- Local volunteer fire department, State forest service, County and other involved agencies.
- 1. Most neighbors willing to do mitigation 2. People in neighborhood connected with fire department 3. Our property is near a constant water source where water pumps and hoses may be used. The water is easy to access to fill "pumpkins" at other locations.
- There is a coming together around the importance and standing together when we are threatened and an incredible group of volunteer fire fighters and support.
- 1. Our local Fire Department is very responsive and generous with their time. 2. There is a sense of community with residents that have lived here long enough

to understand that wildfire prevention is a group effort. 3. In times of need the local community bands together.

## **6. What are three things you see as weakness in your community regarding wildfire issues?**

- Border National Forest where no work can be done.
- Part time residents not aware of risks.
- Nothing.
- Under funded rural fire fighting resources.
- Some individual home/landowners are not proactive with respect to mitigation. And some seem unaware of the dangers of wildfires.
- No cell phone access in some areas.
- People not chipping brush piles, letting weeds, grass grow too long, lack of water to keep everything watered in summer & fall.
- Not sure yet haven't experienced any difficulties.
- Lack of available firefighters.. some close properties need to mitigate .. older community.
- I don't see weakness.
- Communication, especially if Internet is down; siloed agencies; absentee property owners.
- We're in the middle of a national forest and susceptible.
- Future fuel in area, stupid people who start fires and current fuel.
- Lack of an organized program for mitigation, affordable labor, and adequate equipment.
- Continual education of new members; fear of fire in any form including Rx fire; low understanding of forest health or watershed concepts.
- My location so close to my property line and behind the house is straight up mountain.
- #1 The lack of internet connections to facilitate communication with neighbors that are without Fire Fighter pagers. #2 The aging of the community and the lack of the necessary abilities to help ones self. #3 The frictions within the Community over finances, and the resulting damages to relationships that must work carefully together to protect ALL of us.
- Lots of trees, rugged terrain, lack of volunteers, lack of funds. Also, concerned about promptness or lack of fire fighters in an emergency on weekdays or weekends.
- No answer.
- Availability of volunteers to help with mitigation work. Lethargy amongst the general public. Lack of communication from locals.
- 1. Careless visitors, generally campers, who don't know or care of the danger they are creating. 2. Patrolling and educating the above. 3. Fire pits.
- Our closeness to public lands. So many tourist visit the area to get out of the city and enjoy the beauty of the National Forests, but being careless with their campfires and not extinguishing them completely.
- Illegal campfires or bonfires during dry and red flag conditions in remote areas where people feel they are above the law. People relying only on the volunteer fire fighters to respond to fire threats. People drive to call 911 instead of putting dirt on a fire to put it out when it is small. We need to advocate that everyone is a volunteer firefighter and to do your part.
- Lack of working relationship with the largest adjacent landowner to private

properties, the Forest Service. Lack of relationship means it's hard to plan collaborative fuel treatments like thinning and prescribed burning to mitigate risk posed to private properties by untreated/unmanaged Forest Service land. No easy access to wildfire and flood risk data. No site-specific hazard assessment (should be addressed through this CWPP). Lack of local training in implementing prescribed burns as a wildfire mitigation strategy.

- Dense forests, high winds, few roads.
- Lack of cell service in Canyon hampers reporting. Lack of DOW responses to help mitigate damages to river habitat which feeds economy locally. Lack of assistance with clearing and disposing of slash.
- Lots of tourist activity & careless behavior.
- The forests are not being mitigated for fire prevention as in years past, we have a layer of kindling lining our forest floors & dead trees are ready to light up.
- Lack of equipment, funding, topography.
- Lack of continuing education of "fire-wise principles", community engagement in fire-wise principle's and actions. Not becoming a "firewise community".
- 1. Bridge to cross 2. No outlet to east 3. Trees near bridge and overhanging road.
- Community needs education regarding mitigation, how to protect their property, where to start, community resources available with easy access to those resources. Are there evacuation plans in place? Communication, as a good portion of community are part time residents.
- Tourist/ campers that are ignorant or not share our concern for wildfires
- 1. A lack of understanding from new residents and visitors regarding the importance of wildfire safety measures. 2. A lack of authority or feeling of empowerment to address individuals that have disregarded fire bans and effectively violated the law. 3. A lack of understanding on the communication channels with reporting violations that have been observed to the proper authorities.

## **7. What are three things you feel your community should do to improve its wildfire resiliency?**

- ?
- Get together for coffee.
- Continue to offer incentives and subsidies for tree removal, chipping, etc. Continued education and communication.
- Nothing.
- Greater local, state and federal funding for rural fire department resources.
- More volunteer fire fighters.
- Modern fire fighting equipment.
- More communication.
- Stay with the current emphasis and plan.
- Have a Chipper available for our Brush Piles, Mow, Weed Eat more often.
- No comment.
- I do not know what more can be done.
- Continued mitigation; continued education; practice drills.
- Fire department funding and quicker response to high fuel areas.
- Survey properties to grade their mitigation, report those grades to property occupants and owners, and form paid labor squads to carry out mitigation for those unable to do it themselves.



- Continue to thin live forests, remove dead and weak -- leaving wildlife habitat in chosen ridgeline areas (2 trees per acre recommended); increase radial clearances around assets following the firewise recommendations and concepts.
- More access to wood mulchers or log cutters to clear out areas of fallen trees and branches.
- #1 Develop a communication system that can reach everyone in a time of emergencies, perhaps by neighborhoods or street areas. #2 Regular meetings to improve communication regarding dangers of wildfires and the "actual time" possibilities of another fire.
- Provide a good mobile communication system to volunteers. Alert communities with text alerts by establishing good internet service/cell service. Provide the chipper at no or low cost to residents. Establish a dump/composting and or burn site for mitigation debris at little or no cost to residents.
- No answer.
- More outreach-I've been very involved out of necessity but I think a lot of folks up the Canyon, particularly part-timers, don't have the knowledge or desire to do the work necessary to combat wildfire. More forest mitigation, which should include controlled burns. More information and communication. During the fire there was quite a bit of information provided by the federal teams, but once the wildfire ended so did communication.
- Volunteer patrols in camping areas to educate the public-ie-Pingree Park Road
- Analyze what mitigation efforts need to be done at each property. Encourage landowners to help their neighbors mitigate. Have water resources identified in advance of a fire. Have a list of local machinery operators that could build fire lines in the area. Perhaps we need to pair up those lacking wood for heating homes in the winter and those needing to reduce the amount of wood on their properties.
- Community conversations about risk/hazard, creation of a database of relevant information community members can consult, formation of collaborative relationships with other landowners and stakeholders to address bigger picture of wildfire resiliency, individual homeowner mitigation where it hasn't been done, investment in prescribed burning expertise perhaps.
- Identify areas of greatest need, prioritize them, begin mitigation.
- Add a couple of locations in the canyon where cell service can be attained through computer links, identify slash disposal sites, maintain over the long term some of the fire barriers created to control the Cameron Peak Fire.
- Additional support for mitigation, ensure we take advantage of state and federal support for mitigation.
- Some kind of central communication that everyone can access.
- More funding, more equipment, continue with plan of attack.
- Develop a "firewise community program; Education.
- 1. Educate homeowners 2. Make equipment available to homeowners 3. Offer more help to those who need it (I am still waiting for removal of slash--5 years or more!).
- Education. Assistance, many are elderly and not physically able.
- Monitor hunting, camping and tourist weekender fire use.
- 1. Clearly communicate the consequences of violating fire bans in way that can reach the broadest audience. 2. Be very diligent in vetting the plans and contractors utilized for prescribed burns. 3. Provide as much signage as

possible in key areas with information on wildfire safety and current fire bans.

## **8. What do you think would hamper efforts at improving wildfire resiliency in your area?**

- National forest land
- NA
- No-one
- Lack of USDA Forest mitigation resources. Poor local fire fighting funding sources.
- Communication is often ignored, particularly if sent by email. But don't know a better way
- Lack of funding for equipment improvements
- Lack of a Chipper, lack of Water.
- Lack of access to property
- Time, as we are not full timers
- I do not know.
- Lack of above.
- Temporary residence like ours
- MONEY
- Negligence
- Lack of treatments, chipper operations, difficulty in implementing Rx fire due to insurance
- Nothing
- Lack of of a willingness to “work amicably” and the cost associated with the mitigation work.
- Lack of volunteers, funds, poor roads.
- No answer
- Lethargy.
- Canyon visitors who are fire unaware.
- Lack of energy, money and motivation. Physically, mitigation is hard work and just cutting down trees does not remove the fuel load. The wood or pine needles need to be removed from the area, somehow and somewhere.
- Lack of funding, lack of adequate modeling/information on wildfire/flood risk, lack of understanding or knowledge of site-specific risks on part of homeowners because of lack of access to information. Lack of funding at federal level toward wildfire prevention, meaning lack of availability of Forest Service staff to work directly with this community on joint resiliency efforts.
- Cost
- Many people are older and retired in the area and incapable of undertaking defensible space development, and are not necessarily financially capable of hiring the work done. Also, many owners are not full time residents and have limited time to work on these issues.
- Most of mitigation activities
- n/a
- Lack of funding
- Human resources, labor, personal time commitments, behavioral tendencies for “Out of sight out of mind” thinking.
- Lack of people to help and some homes are only used occasionally so owners are not around and seem not to be concerned
- I think it is many of the same things that have previously been answered

- Not staying on top of visitors
- A lack of resources for the local Fire Department and delayed response times for reported fire ban violations. A lack of clear and concise signage for people visiting from outside of the area. A lack of accessible information resources to inform everyone on why fire mitigation efforts are necessary and essential.

## 10. Do you have any other suggestion for us to help make our community fire-adapted so we can survive wildfires?

9. Are you interested in learning more about forest health/fuel mitigation work or perhaps you are ready to pursue projects right now?

33 responses



- No
- No
- Have a class online, in person to offer suggestions for what the “NEW Property” owners need to know!
- No
- 200,000 acres were burned in our area. During the fires there was near panic to remove trees, make access roads/trails to burning area by firefighters. On a preventative basis, could the Forest Service strategically but economically cut trails, roads even clearcut in the mountains??? In the mountains is so much beetle kill. You know one day that it will ignite. The Forest Service needs to stay ahead of it throughout Colorado.
- Post the results of the mitigation evaluations conducted by property.
- Consider an expansion of your mitigation crew; actually consider a 3 project goal for every able member to serve on that crew; designate a demonstration area to teach neighbors and new homeowners (closer and similar to our BSA camp western boundary with Shamballa / Drala Center lands)
- Regular inspections of homes and structures by qualified personnel, to assess possible areas for mitigation.
- None
- When a wildfire is being spurred on by high winds and hot, dry temperatures, there is absolutely nothing that can prevent the forest or community from burning. All the mitigation in the world (and we had done quite a bit) isn't going to save a structure if no attempt is made to fight the fire, and sometimes they are too dangerous to fight. Do the mitigation, to the best of your ability, but don't assume your property will survive wildfire.
- Educate the homeowners and constantly remind them of fire hazards around their homes. Remind them of sound and bad practices, ie. wood pile storage, and fireplaces. A resource/contact list of companies in the area willing to perform jobs ie. chimney cleaners, tree services, handymen, electricians,



landscapers...

- I think we have to recognize our proximity to public land as both a benefit and a liability and work in a collaborative manner with the multiple stakeholders in this canyon (e.g. cities of Greeley & Ft Collins, Parks & Wildlife, Forest Service, NRCS, CPRW, etc.) to expand the conversation of adaptation beyond just individual household mitigation measures. I also think we need to acknowledge the additional hazards that are exposed following wildfire in this canyon, particularly flash floods and debris flows, and target wildfire mitigation efforts in conjunction with modeling that might show us where the most severe flooding might occur following a wildfire.
- Secure state and federal funding
- Given the colliding weather, wind, moisture, slope, and fuel environments experienced during the Cameron Peak fire, sometimes fires simply cannot be controlled without undue risk to firefighters. Homeowners need to understand this, and regardless of the amount of pre-planning undertaken, it is still a wildland interface area where structures are likely to be lost. However, lives do not need to be lost. People should understand evacuation routes and take early advantage of escaping a large oncoming fire front. In my home district, we all subscribe to Smart 911 and Lookout Alert services, but given the lack of cell coverage in the canyon, I'm not sure how people (mostly non-full time residents) without a land line would be contacted about a fire and evacuation.
- Have homeowner's insurance.
- As above, continuing education about "firewise principles" and "firewise communities" for starters. I suspect that this survey is about this education and action. Thank you for doing this.
- Be a little more careful with back-burns.

## **Community Meetings**

### **Group Discussion Notes Summarized**

#### **What are the top 3 things that are going well in your community as they relate to wildfire risk & preparedness?**

- We have already had a fire
- Flood mitigation
- We know something more about how wildfire moves through this landscape
- We are mitigated much better than in 2020
- That we are creating this wildfire plan
- Black Diamond plan
- Home ignition zones are good
- Prescribed burns have been effective
- Growing understanding of risk
- Good examples of mitigation successes (Scout Ranch)
- Good coordination with partners and fire district
- CWPP is keeping people engaged
- Ability/willingness to adapt and recover post-fire
- Our new firehouses
- We've learned and experienced from living through fires and floods
- Proximity of fire stations
- Chipper can be used for mitigation, groups of neighbors assist with slash
- Quality people in charge of fire department
- Community has experienced two large wildfires and are well prepared
- Good facilities and adequate equipment and apparatus
- Fires have removed some fuels
- Chipper program
- Community support for mitigation and support for fire district

#### **What are your community's top 3 wildfire-related risks?**

- Eventually there will be re-burn risk
- Lack of water access to fill fire tankers especially in winter
- Flooding
- Limited access to buildings/homes; not a lot of roads/ limited egress, overgrown roads
- Illegal fires
- Better water access
- Inventory of the canyon
- Need to make sure access is good and access is clear
- Forest Service land is the major problem
- Egress & clearances
- Too many stands of un-thinned forest
- Adjacent fuels next to structures
- Power lines across exits
- Accumulation of fuels
- Disproportional ration of scale to capacity
- Public risk from negligence/ignorance
- Defensible space of roads/properties
- Road accessibility ie Fall Creek is washed out, difficult to drive especially for emergency vehicles

- Ground fuels - debris, pine needles
- Need to trim/maintain overgrown landscape
- Homes that are only used for a few times per year
- Beetle kill, access, wildland/urban interface, lack of forest service mitigation, illegal fires, recreation, and opportunity for ignitions, non full-time residents and their lack of knowledge
- Lightning
- Fires will most likely be around houses
- There is still a lot of unburned forest and dead trees from beetle kill

### **What are three opportunities for improvement in the community?**

- Need manpower for proper mitigation
- Forest Service should clear debris back from streams where it has already burned to prevent flooding
- Communication with community members about opportunities to create defensible space
- Forest Service should do wildfire risk reduction in areas adjacent to private property
- Redo mitigated areas
- Education
- Bury lines across roads - concrete fire resistant poles in key areas
- Better egress and turn around areas for fire trucks
- Limb entrances
- Bridge is out at Profile Rock - build a ford?
- Better water access especially in winter
- Evaluate all homes
- Eradicate cheat grass
- Mitigation Crew needed
- Chipper operations, saw crews/ piling crews and burn crews
- Willingness of community and partnering agencies to act
- Training/workshop opportunities (chainsaw, pile burning, etc.)
- Community outreach (signup for work)
- Community projects
- Community wood pile and chipping
- Awareness (need for clean-up) residents get lazy if there isn't fire activity
- Communication/reminders/fire mitigation tips/ newsletter
- Community mitigation project that show mitigation in progress, pile burning workshop,
- Employ a person to do mitigation, meetings/workshops
- Demo of mitigation at a property
- Have a slash pile collection area
- Is there a way to better communication plan? ie NOAAlerts? When power goes out, communication goes out.

### **What are the top 3 barriers to achieving these improvements?**

- Money, people, equipment
- Qualified contractors
- Post-wildfire risk reduction guidance is lacking
- Unmitigated neighbors
- Slopes of the mountains



- Forest Service people in the area
- Roads on private land to mitigate
- There are not enough customers in the canyon to get attention especially with CenturyLink
- Need to talk to individual landowners
- Access to sheriff's office data, application & how to use them
- A lot of private drives need trimming
- Keeping people engaged
- Homeowner approval
- Risk aversion/insurance
- Funding
- Amount of work is overwhelming
- \$\$\$
- Capacity organize/coordinate/outreach
- Scale
- Utilizing woody material
- Equipment (saws, PPE, chaps, trailers, etc.)
- Not knowing neighbors or new neighbors not from area or not knowing your summertime or part-time neighbors
- Stubborn landowners - only want left alone
- Funding
- Equipment and manpower
- Mis-information/lack of information/unsure what fire mitigation means
- Funding
- Lack of government cooperation (forest service)
- Need man-power and resources
- Homeowner apathy
- Thinning needs to happen on Forest Service land
- Frustration with neighbors who are not mitigating
- Some part-timers only have a short time to mitigate and many don't want to spend their vacation time doing mitigation
- Could we get a delegation letter to have us mitigate their property?

**Circle three priority areas on the map that should be mitigated to help protect the community.**

- Crown Point
- Mineral Springs
- Teach people to put out their campfires
- Shady Rest
- 1 Rustic area
- 2 Manhattan area
- Mostly USFS
- Willing private landowners
- Boyd's Gulch
- Columbine trees
- Unger Mountain

## Access to water

### Poudre Park

- MM 117 — Lower access to Gateway - Good Drafting Site
- MM 114.5 — Smith Bridge, across the river on the right DRYWELL
- MM 114.7 — Bridges Take Out - Good Drafting Site
- MM 112.8 — Bridges Put In - Good Pumping Site
- MM 111.6 — Columbine - Good Drafting Site
- MM 111 — Across Hewlett Gulch Bridge - Good Drafting Site
- MM 111 — Forest Service - Dry well just west of the Hewlett Gulch Bridge
- MM 110.5 — Poudre Park Picnic Area - Good Drafting Site
- MM 110.2 — Diamond Rock Picnic Area - Good Pumping Site
- MM 109.7 — Ouzel Picnic Area - Good Pumping Site
- MM 109.1 — Ansel Watrous Camp Ground #2 - Good Pumping Site
- MM 109 — Ansel Watrous Camp Ground #1 - Good Pumping Site
- MM 108.2 — Mishawaka Inn - Good Drafting Site and a DRYWELL in the parking lot east of the main building
- MM 105.4 — Stove Prairie Landing Camp Ground - Good Pumping Site
- MM 105.1 — Upper Landing Picnic Area - Good Pumping Site
- MM 104.7 — Stevens Gulch Picnic Area - Good Drafting Site
- MM 101 — Narrows Camp Ground - Good Drafting Site
- MM 100.6 — Dutch George Camp Ground - Good Pumping Site
- MM 100 — Century Park Picnic Area - 7 Good Pumping Site
- 

NOTE: Pumping Sites can be used with floating pumps, but the water is too far away to draft with an engine

NOTE: All Forest Service Campgrounds are locked during the winter months.

### Rustic

- MM 98.9 — Mountain Park Camp Ground - Good Pumping Site
- MM 97 — Kelly Flats Camp Ground - Good Pumping Site
- Indian Meadows bridge area — N 40\* 42.014, W 105\* 32.647
- Bighorn cabins — Next to the Elk cabin. Since this a business, water access is for emergency situations only.
- U BAR U Lane — Water Draft and float pumpsite, Keller Property. N 40\* 41.856, W 105\* 35.965
- Poudre City — Pond (summer only) N 40\* 41.784, W 105\* 36.185
- Poudre Canyon Chapel -- Dry well site west of the chapel — N 40\* 41.965, W 105\* 37.554. This drywell needs rehab (2023)
- MM 87.3 — Black Hollow stream across bridge then left to small bridge
- MM 84.7 — Home Moraine Trailer Park, near laundromat (floating pump) N40\* 41.727, W105\* 41.621
- MM 83.8 — Poudre Fish Hatchery has an overhead pump site and draft sites. Staff can assist.

NOTE: Even though the PCFPD cannot get a truck near the water in many locations, many homes along the river can be defended using a floating pump.

NOTE: MM notations are on US Highway 14.

## Spencer Heights

Even though the PCFPD can not get a truck near the water in many locations, many homes along the river can be defended using a trash pump or floating pump.

Established fill sites;

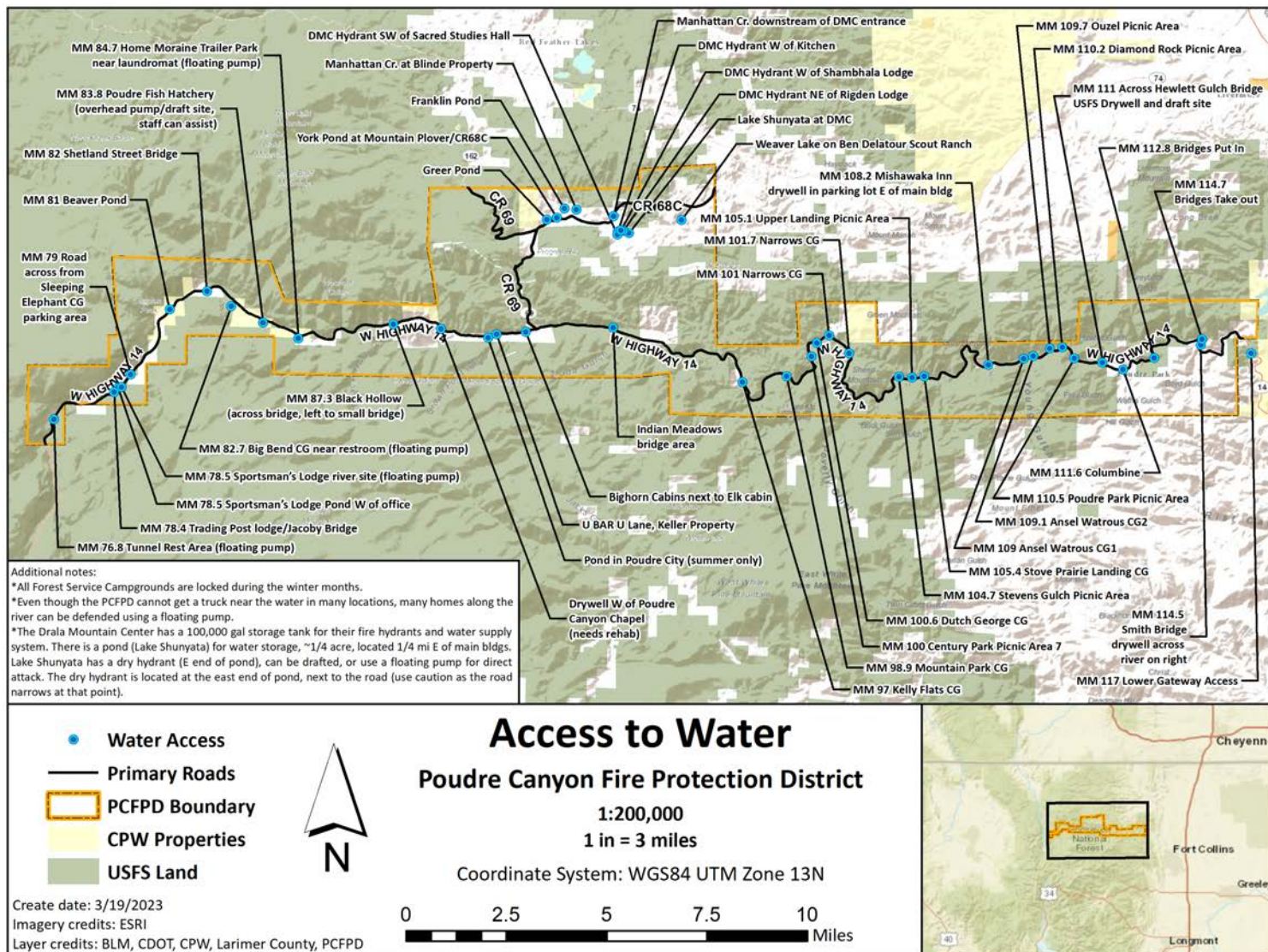
- MM 82.7 — Big Bend Campground, near restroom (floating pump) N40\* 42.540, W105\* 46.852
- MM 82 — Shetland Street Bridge N40\* 42.740, W105\* 44.238
- MM 81 — Beaver Pond on parking road N40\* 42.348, W105\* 44.276
- MM 79 — Road across from Sleeping Elephant Camp Ground parking area draft site N40\* 40.916, W105\* 46.387
- MM 78.5 — Sportsman's Lodge Pond, west of office
- MM 78.5 — Sportsman's Lodge river site (floating pump) N40\* 40.645, W105\* 46.646
- MM 78.4 — Trading Post Lodge/Jacoby Bridge N40\* 40.529, W105\* 46.852
- MM 76.8 — Tunnel Rest Area (floating pump) N40\* 39.930, W105\* 48.566

## Manhattan Creek

- Weaver Lake on Ben Delatour Scout Ranch
- 5 Hydrants at the Drala Mountain Center (N 40 44. 098: W 105 32.543)\*
- Lake at the Drala Mountain Center (N 40 44.074: W 105 32.209)
- Manhattan Creek (several locations)
  - Blinde house
  - Elkhorn Trailhead
- York Pond at corner of Mountain Plover and CR68C (N 40\* 44.427: W 105\* 34.215)\*
- Freer Pond
- Franklin Pond at Jerry Franklin's house\*
- Seven Mile Creek on lower CR 69

\*The Drala Mountain Center has a 100,000 gallon storage tank for their fire hydrants and water supply system. There is a pond (Lake Sunyata) for water storage, approximate size is 1/4 acre. Lake Sunyata has a dry hydrant, can be drafted, or use a floating pump for direct attack. The dry hydrant is located at the east end of pond, next to the road (use caution as the road narrows at that point). The pond is located 1/4 mile in to the east of the main buildings. For hydrant locations see the map included as appendix B. York Pond at the junction of Mountain Plover and CR68C on the North side of road at gate to Jerry Franklin's property. There is another pond just west of the York Pond that has a locked gate and Jerry Franklin has use rights for the water. Franklin also has a pond on his property. Franklin's pond uses water from the Elkhorn Creek and/or Manhattan Creek systems.







# Helicopter Landing Areas

## Poudre Park

- MM 112 — Hewlett Gulch (Elev 5706) N40\*41.337 W105\*18.503
- MM 105.8 — Stove Prairie Road (Elev 6082) N40\*40.967 W105\*23.308
- MM 101.7 — Narrows Camp Ground entrance
- MM 100.6 — Dutch George Camp Ground entrance

[Link to County Wide Helicopter Landing Zones](#)

## Rustic

- MM 97 — Kelly Flats parking area (Elev. 6796) N40\*40.9926 W105\*28.9390
- MM 94.4 — Indian Meadows Parking Area — (Elev. 7020) N40\* 41.743, W105\* 31.570
- Samples Meadow (across the Crown Point bridge) — (Elev. 7460) N40\* 41.802, W105\* 35.911
- MM 83.8 — Poudre Fish Hatchery north side of highway (Elev. 7700) N 40\*42.152, W105\*42.635

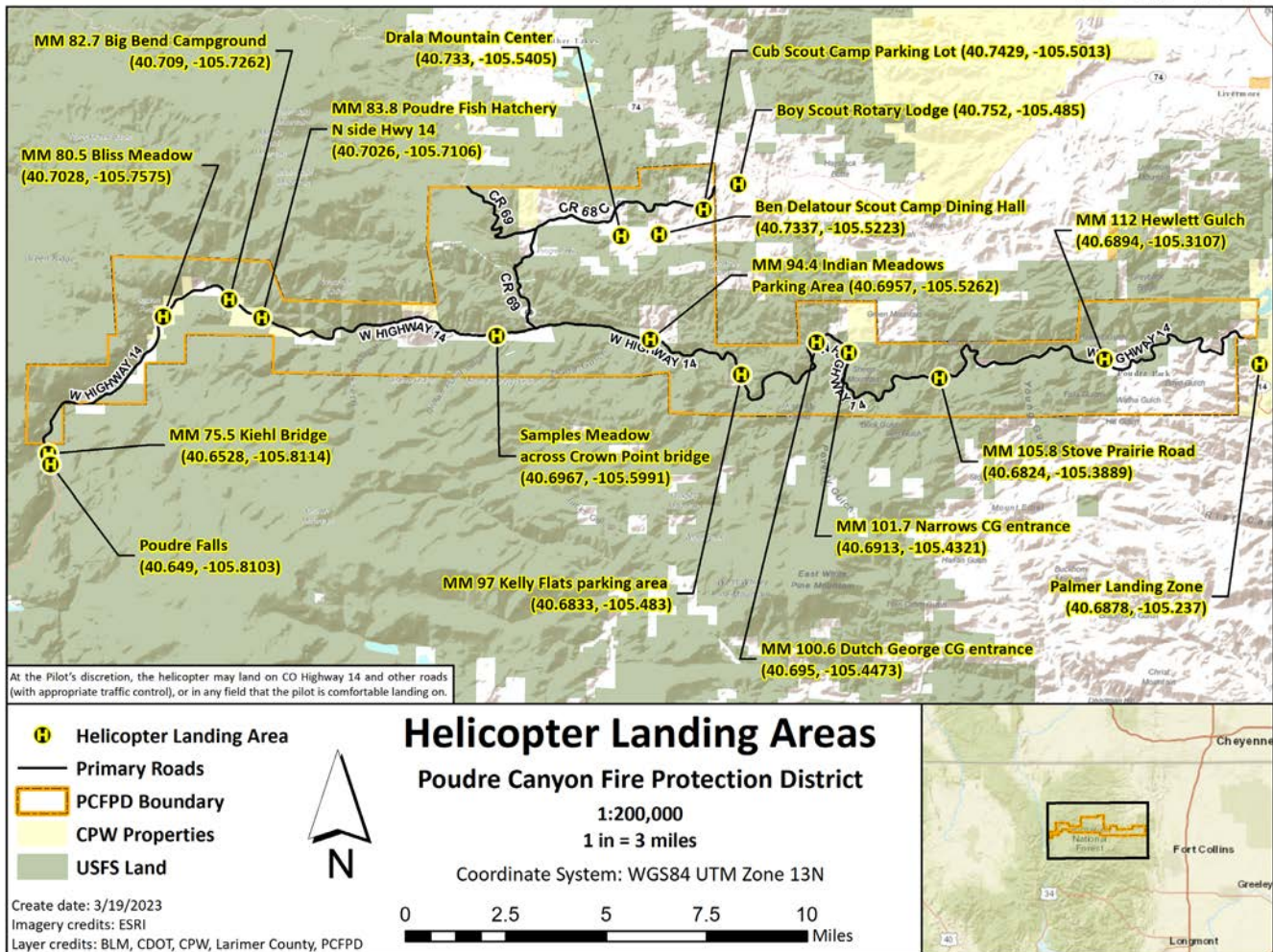
Note: At the Pilot's discretion, the helicopter may land on Highway 14 and other roads (with appropriate traffic control), or in any field that the pilot is comfortable landing on.

## Spencer Heights

- MM 82.7 — Big Bend Campground (Elev. 7785) N 40\*42.540, W105\*43.573
- MM 80.5 — Bliss Meadow (Elev. 7800) N 40\*42.170, W105\*45.450
- MM75.5 — Kiehl Bridge (Elev. 8140) N 40\*39.169, W105\*48.685

## Manhattan Creek

- Drala Mountain Center
- Ben Delatour Scout Camp
- 809 Mountain Plover Lane



As you embark on efforts to mitigate wildfire risk on your property and organize coordinated action with your neighbors, the following organizations can provide useful guidance and information on available resources. If you live in a subdivision with a Homeowners Association, you can contact them to help you organize action in your neighborhood. The contact information below is current as of March 2023.

## **Fire Protection District and Other Emergency Managers**

- Poudre Canyon Fire Protection District –  
Chief Hugh Collins [h.collins@poudrecanionfiredistrict.org](mailto:h.collins@poudrecanionfiredistrict.org);  
Bette Blinde, Assistant Chief [b.blinde@poudrecanionfiredistrict.org](mailto:b.blinde@poudrecanionfiredistrict.org)
- PCFPD Website – <https://www.poudrecanionfiredistrict.org>
- Larimer County Sheriff's Office of Emergency Services – Derek Rosenquist;  
[rosenqdc@co.larimer.co.us](mailto:rosenqdc@co.larimer.co.us)

## **Land Managers and Other Stakeholders that Support Wildfire Mitigation**

- Coalition for the Poudre River Watershed – Daniel Bowker; [daniel@poudrewatershed.org](mailto:daniel@poudrewatershed.org)
- Colorado State Forest Service – Max Erickson; [max.erickson@colostate.edu](mailto:max.erickson@colostate.edu)
- Larimer Conservation District – Gretchen Reuning; [gretchen@larimercd.org](mailto:gretchen@larimercd.org)
- Larimer County Conservation Corps – Maelly Oropeza; [oropezma@co.larimer.co.us](mailto:oropezma@co.larimer.co.us)
- U.S. Forest Service, Canyon Lakes Ranger District – (970) 295-6700 / [visitarp@usda.gov](mailto:visitarp@usda.gov)
- Ben Delatour Scout Ranch – Bob Sturtevant; [robert.sturtevant@colostate.edu](mailto:robert.sturtevant@colostate.edu)

## **Larimer County Government**

- EMERGENCIES 911
- Animal Control - Larimer Humane Society (970) 226-3647
- Assessor's Office (970) 498-7050
- Building Department (970) 498-7700
- Clerk & Recorder (970) 498-7860
- Coroner's Office (970) 498-6161
- Larimer County-CSU Extension Office (970) 498-6000
- Economic Development & Workforce Center (970) 498-6641
- Human Services (970) 498-6300
- Motor Vehicle Manager's Office (970) 498-7010  
Fort Collins (970) 498-7878  
Loveland (970) 619-4521  
Estes Park (970) 577-2025
- Natural Resources (970) 619-4570
- Office of Emergency Management (970) 498-7147
- Planning Department (970) 498-7683
- Public Health & Environment (970) 498-7000
- Road and Bridge (970) 498-5650
- Sheriff's Office (970) 498-5100
- Sheriff's Office Non-Emergency (970) 416-1985
- Solid Waste (970) 498-5760



## References, Resources and More Information

Boulder National Weather Service

[www.weather.gov/bou](http://www.weather.gov/bou)

National Flood Insurance Program

[www.floodsmart.gov](http://www.floodsmart.gov)

Emergency Preparedness

[www.fema.gov](http://www.fema.gov)

[www.ready.gov/floods](http://www.ready.gov/floods)

[www.ready.gov/be-informed](http://www.ready.gov/be-informed)

[www.redcross.org/get-help/how-to-prepare-for-emergencies](http://www.redcross.org/get-help/how-to-prepare-for-emergencies)

[www.weather.gov/bou/floodafterfire](http://www.weather.gov/bou/floodafterfire)

[cwc.colorado.gov/flood-after-fire](http://cwc.colorado.gov/flood-after-fire)

[mars.colorado.gov](http://mars.colorado.gov)

[dhsem.colorado.gov/info-center/readycolorado](http://dhsem.colorado.gov/info-center/readycolorado)

[www.larimer.org/emergency](http://www.larimer.org/emergency)

Monitor River Gauges

<https://water.weather.gov/ahps2/index.php?wfo=BOU>

Wildfire Recovery

[www.larimer.org/wildfire-resources](http://www.larimer.org/wildfire-resources)

[www.larimer.org/emergency/recovery](http://www.larimer.org/emergency/recovery)

Ready.gov

<https://www.ready.gov/floods>

Federal Emergency Management Agency (FEMA) / National Flood Insurance Program (NFIP)

<https://www.fema.gov/node/404917>

Colorado Water Conservation Board (CWCB)

<https://cwc.colorado.gov/flood-after-fire>

National Weather Service (NWS) / National Oceanic and Atmospheric Administration (NOAA)

<https://www.weather.gov/wrn/spring2017-flood-sm>

Colorado Department of Homeland Security and Emergency Management (DHSEM)

<https://mars.colorado.gov/dr4581-wildfire-recoveryResources for More Information on Fire Behavior>

[Larimer County's Hazard Mitigation Plan](#)

Colorado State Forest Service - [Colorado Forest Atlas](#)

[Wildfire Risk to Communities](#)

[Colorado Forest Restoration Institute](#)

[Colorado Division of Fire Prevention and Control](#)

[Link to County Wide Helicopter Landing Zones](#)

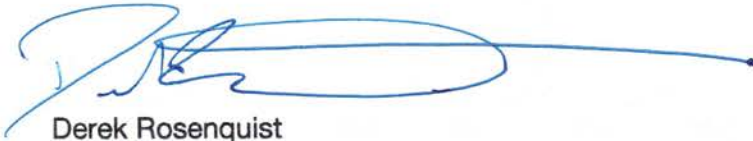
[FEMA Emergency Notification app](#)

[Quantitative Wildfire Risk Assessment](#)

**Poudre Canyon Fire Protection District  
Community Wildfire Protection Plan - 2023  
Signature Page**



Max Erickson  
Supervisory Forester  
Colorado State Forest Service



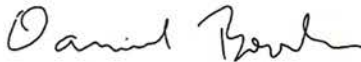
Derek Rosenquist  
Sergeant, Emergency Services Unit  
Larimer County Sheriff's Office



Gretchen Reuning,  
Director Natural Resource Program  
Larimer County Conservation District



Matt Marshall  
Director of Forestry  
Larimer County Conservation District



Daniel Bowker, CF  
Forest and Fire Project Manager  
Coalition for the Poudre Watershed



Hugh Collins  
Fire Chief  
Poudre Canyon Fire Protection District