Carroll Lakes
Community Wildfire Protection Plan

FR 312 leading to Carroll Lakes after 2021-2022 Forest Restoration and Wildfire Mitigation Project.

Update
March, 2024

Colorado State Forest Service
El Paso County Sheriff
NE Teller Fire Protection District
USFS, Pikes Peak District

Prepared by:

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Colorado Springs Fly Casting Club

ACCEPTANCE

The Carroll Lakes Community Wildfire Protection Plan (CWPP) was developed in accordance with the guidelines set forth by the Healthy Forest Restoration Act of 2003, Colorado State Forest Service Minimum Standards for CWPP's, and FEMA CWPP guidelines dated May 2020.

This CWPP is a collaborative effort to guide our wildfire protection efforts. The activities described are appropriate to meet our objectives. The plan is voluntary, and where possible, we intend to fully implement our action plan.

The Carroll Lakes Community Wildfire Protection Plan has been reviewed and approved by the following agencies:

Gene Scivally, President, Colorado Springs Fly Casting Club — Date: 2-28-2024

Andy Schlosberg, Colorado State Forest Service — Date: 2-26-2024

Larry Long, Deputy Fire Warden, El Paso County Sheriff's Office — Date: 2-26-2024

Tyler Lambert, Fire Chief, NE Teller Fire District — Date: 3-5-2024

TIMOTHY ROSS Digitally signed by TIMOTHY ROSS Date: 2024.02.21 11:35:40 -07'00'

Name, USFS, Pikes Peak District — Date

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Preface to the Updated Plan

The Carroll Lakes area can be characterized as a mountain community with permanent and recreational home sites scattered throughout. Most of the home sites are members of the Colorado Springs Fly Casting Club (CSFFC) and are located along the lakes within the center of the area. CSFCC land (approximately 180 acres) is owned by the club and Allen Durrett (approximately 40 acres). The area is surrounded by Pike National Forest land on the west, north and east sides and Farish Memorial Recreation Area (USAFA) on the south. Individual CSFCC members own their cabin and other improvements.

The original Carroll Lakes Community Wildfire Protection Plan (CWPP) was prepared by Land Steward Associates in 2005. The previous update was in 2014. There have not been and additional homes or roads constructed since 2014. Community participants in this 2024 update are the Colorado Springs Fly Casting Club and Allen Durrett. Additionally, input and assistance was provided by Colorado State Forest Service, El Paso County Sherriff Wildland Fire Management, and Northeast Teller Fire District.

Since the 2014 update, extensive forest thinning has been completed in Pike National Forest surrounding the Carroll Lakes Community. Likewise, significant fire mitigation projects have been completed within the Carroll Lakes Community thanks in part to being awarded three cost sharing grants. This includes nearly all of the projects listed in our 2014 action plan. In addition, we have acquired two 500 gallon water trailers with on-board pumps to draw water from our lakes for fire suppression until fire teams arrive. Our year-around caretaker has been trained on the equipment and practices periodically. Additionally, CORE Electric Utility has replaced all electrical poles, lines, and transformers, installed new safety features, and removed trees from under and around all powerlines within our community.

Carroll Lakes Community has been a Firewise Community in good standing since 2016. More than half of our members report completed fire mitigation work and those hours and expenses are included in our annual Firewise renewal application. We conduct training and provide fire mitigation handouts to all members at our annual club meeting and encourage active participation from our members. Our detailed evacuation plan has been given to all members and a tour of the evacuation route is offered to members at our annual meeting.

Since 2014, the risk of catastrophic wildfire in the Carroll Lakes Community has been reduced from high to low as a result of (1) completion of forest restoration and fire mitigation projects in Pike National Forest land surrounding the community, (2) fire mitigation projects completed since our 2014 update, (3) replacement of all electric utility lines and equipment, (4) continuing maintenance of treated areas, (5) acquisition of organic fire prevention and suppression capabilities, (6) active participation of members of our community, and (7) a board of directors committed to support our fire mitigation action plan.

Objectives of the Plan

Priority 1: Defensible space around all home sites and primary evacuation routes.

Priority 2: Interior treatment areas closest to homes; private and "good neighbor" projects; secondary evacuation routes.

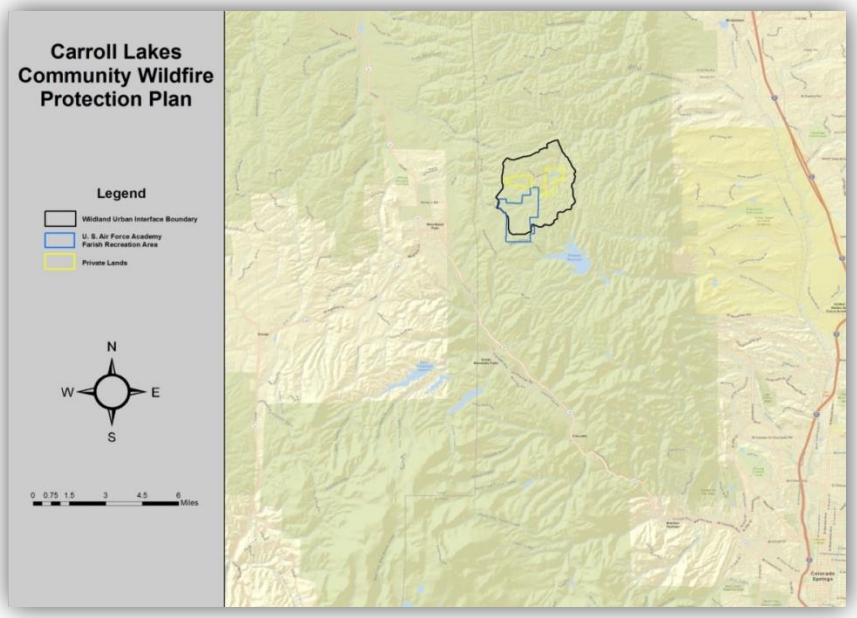
Priority 3: Protect the lakes from sedimentation after a catastrophic wildfire.

Priority 4: Improve forest health and increase forest diversity for insect and disease prevention and improved wildlife habitat.

I. AREA AND COMMUNITY IDENTIFICATION AND DESCRIPTION

Location and General Description

The Carroll Lakes Area is located in the upper South Beaver Creek watershed that flows into Monument Creek through the United States Air Force Academy (USAFA). There are 55 structures located on the CSFCC, Durrett and Farish properties. The area is about 4 miles west of the AFA (western boundary) and about 4 miles northeast of the town of Woodland Park. The area is about 15 miles northwest of Colorado Springs, following highway Hwy 24. The Carroll Lakes Area is approximately 3220 acres in size, and ranges in elevation from 8,900 to 9,300 feet. Nine man-made lakes (Sapphire Lake, Leo Lake, Grace Lake, Lake Judy, Aspen Lake, Boulder Lake, Columbine Lake, Gem Lake, and Rainbow Lake) run through the center of the area along South Beaver Creek. The Carrol Lakes Community is approximately 220 acres of private land within the area. The following vicinity map identifies communities landownership - Pike National Forest, private land (CSFCC and Allen Durrett), and Farish Memorial Recreation Area (USAFA), and the Wildland-Urban Interface (WUI) Boundary. Highway US 24 accesses the area from Colorado Springs. The Rampart Range Road (FR300) which begins near Sedalia, Colorado, accesses the area from the north.



II. COMMUNITY ASSESSMENT

Community Values at Risk

There are four "neighborhoods" or subdivisions, including the USAFA Farish Memorial Recreation Area, with 52 home sites in the Carroll Lakes Community. Some home sites have heavy fuels nearby and around them. Most homes are wood frame construction and many date back to 1920-1930. Many of the structures have recognizable defensible space. Propane tanks on some home sites are too close to the building. Some power lines to structures are too low. Many have flammable material near-by, on the porch, or under decks, increasing their vulnerability. While many of the homes have metal roofs, a few of the structures have wooden shingle or shake roofs. The composition and wooden roofs tend to hold pine needles and forest debris allowing accumulations that also increase vulnerability to fire brands.

The Carroll Lakes Community contains 5 small lakes used for recreation, primarily fishing, purposes. Substantial costs could be incurred in removing sediment and debris from these lakes if a wildfire occurred in the WUI, similar to the costly removal of debris in Strontia Springs reservoir following the Buffalo Creek Fire.

Because of the lack of defensible space around some home sites, natural fuel continuity, and steep slopes between some of the neighborhoods, it would be difficult to protect some home sites from wildfire during periods of high to extreme fire danger.

Access to the community is from the Rampart Range Road via Forest Service Road 312, also known as Carroll Lakes Road. At the end of Road 312, three forks lead to various areas of the community. These roads are marked and appear on Google and other online mapping apps. Some areas are narrow with minimal clearance for emergency vehicles.

Within the community, roads branch to various houses with directional signage at the forks. All houses are marked with a unit number using reflective numbers 4" high.

As explained in our emergency evacuation plan, a secondary exit may be possible through Farish Recreation area using the abandoned section of FSR 312. However, the road is not maintained and there is a barbed wire fence at the Farish property line that must be cut (a cutter is stored nearby as explained in the evacuation plan). It would be suitable only as a last resort. Some other roads access the area from the Schubarth Trail, but these are unmaintained four wheel drive roads. They would not be viable alternatives for emergency evacuation.

If a fire is threatening the area, it is not necessary to wait for an evacuation order to leave.

From the Rampart Range Road, escape would most likely be south into Woodland Park. Alternatively, escape could be north to Mt. Herman road down to Monument or Rampart Range Rd east to Colorado Springs.

Colorado Springs Fly Casting Club (CSFCC) Emergency Evacuation Plan

NOTICE TO EVACUATE. In case of a fire or other emergency, the primary notification to evacuate CSFCC will be issued by the El Paso County Sheriff by means of a reverse 911 call. Members should follow directions provided in the recorded message. Other notifications may come from local TV and Radio stations or from Nick/other club members. Be sure to leave the club gate open as you depart the club grounds.

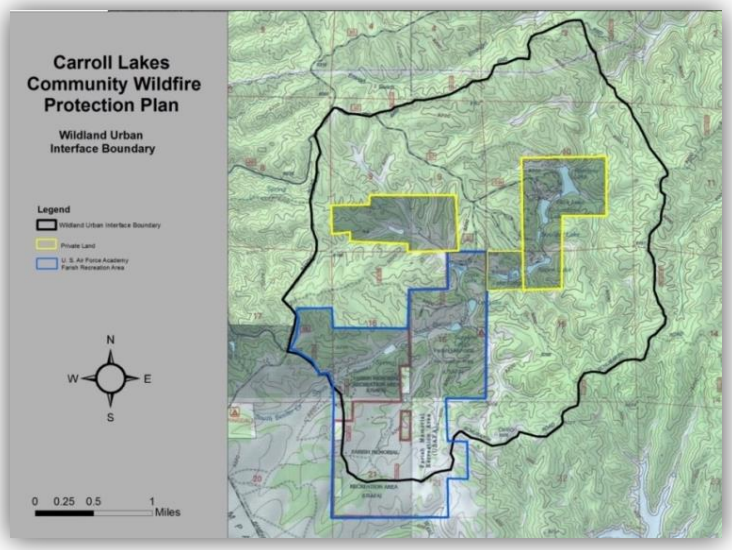
EVACUATION ROUTE. The primary evacuation route is west on FR 312 to Rampart Range Road and from there south to Woodland Park. Alternate routes are north on Rampart Range Road or east thru the Air Force recreation area (Farish).

- If Rampart Range Road is blocked or unsafe to the south, leave the area via Rampart Range Road north towards Denver If safe, turn east on Mt. Herman Rd to Monument or continue north towards Denver.

- If FR 312 is blocked or unsafe to the west, go east to the old Farish road. Use your club gate key to unlock the Durrett gate and go around the boulders which are blocking the old road. Drive carefully down the left side of the old road bed and proceed thru the fence (use wire cutter provided at the fence line) to enter Farish property. Follow the signs thru Farish to Rampart Range Road and drive in the direction away from the fire or as otherwise directed by Farish personnel.

It is important to note that the fatalities in both the Waldo Canyon and Black Forest Fires were of residents who did not evacuate in time. In the event of a fire, the El Paso County Sheriff will determine the best evacuation routes and procedures based on expected fire behavior. Residents should heed the evacuations instructions given by the Sheriff without delay! If a fire is threatening the area, it is not necessary to wait for an evacuation order to leave.

Reverse 911 calls are not automatically routed to cellular phones. Residents who rely only on cellular phones should register their cell phones at: https://member.everbridge.net/index/1772417038942752 to be certain of notifications. While cellular telephone service is not available in most of the Carroll Lakes area, many members have Starlink Internet and WiFi calling. Our full time caretaker and members help ensure that everyone on the property is notified when an emergency situation arises.



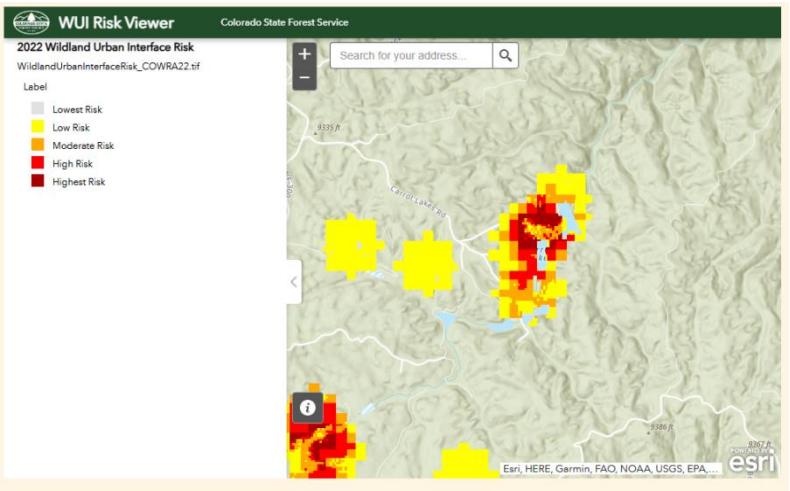
Wildland Urban Interface Boundary

The wildland urban interface (WUI) boundary is defined as the area where a

wildfire would be a threat to the community. The boundary as defined for the 2005 plan remains in effect. Rampart Range Road is the western boundary, and Forest Road 314 marks the northern boundary. Schubarth Trail is generally the southern and eastern boundary. This area defines the Beaver Creek Drainage where sedimentation from a fire would degrade the water quality of the lakes.

Carroll Lakes Community Wildfire Risk Analysis

Vegetation is dominated by a mixed conifer forest consisting of ponderosa pine, Douglas-fir, and spruce. Aspen is scattered throughout forest and has been released as a result of recent treatment. The release of the aspen will improve vegetation diversity and will improve wildlife habitat. North slopes are denser, with larger trees, while south slopes are also dense but trees are shorter and have less Douglas-fir present. Ladder fuels, fuel near the ground that would be a pathway for a ground fire to reach the tree tops, are present throughout most of the forest. However, the risk of crown fire has been greatly reduced by recently completed forest restoration and fire mitigation projects.



Carroll Lakes Community Wildfire Risk Analysis

There are 55 structures in the Carroll Lakes Community. The wildfire risk map represents the Colorado Forest Atlas analysis of the wildfire risk. The map shows areas of low to high risk within the community. It should be noted that most of the perimeter shows low risk and the the surrounding forest shows lowest risk due to extensive forest restoration and fire mitigation work that has been completed. Therefore, the greatest risk is that a fire would start within the community. Nevertheless, the areas of highest risk are relatively small which may limit the speed and extent of spread to other areas. Furthermore, community rules and regulations prohibit camp fires, fireworks, shooting, and outdoor smoking which are common causes of fires. All electric utility lines and equipment within the community have been replaced by CORE Electric CO-OP. Fuels under and near the lines have been removed and those areas are well maintained by CORE. Members of the community are proactive in fire mitigation within their homes and adjacent areas. Finally, newly acquired organic fire suppression capability will be used until fire crews arrive thereby reducing potential spread. Based on these factors, the overall risk of catastrophic wildfire in the Carroll Lakes Community is believed to be low.

When interpreting Colorado Forest Atlas (CFA) data it should be noted that predictions are based on the average of historical weather over time. Thus, CFA does not predict fire behavior on any given day, and weather conditions at the time of a fire greatly influence actual fire behavior and spread. For example both the Waldo Canyon and Black Forest fires burned during the most severe fire weather and not on average days. The effect of weather conditions on fire behavior is further explained in the section on fire behavior.

One such fire, the Hayman (2002, the 4th largest wildfire on record in Colorado) burned about 7 miles north of the area. The Waldo Canyon fire in 2012 stopped about 1.5 miles south of the area. A substantial portion of the Hayman and Waldo Canyon fires were severely burned with high intensity burns, leaving patches of hydrophobic soils and significant erosion.

Fuel Model Analysis:

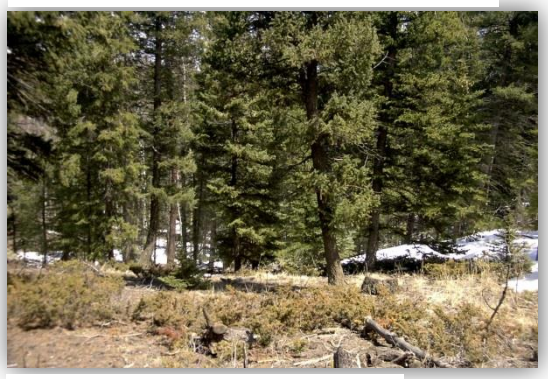
Dense ponderosa pine, Douglas-fir, and spruce stands have been treated and now are unlikely to support crown fires in the surrounding forest. Ground fuel is characterized by fuel models 8 and 9 in these forested areas. Because of a significant amount of dead and down material, a small patch of fuel model 10 is present. *Table 1* gives fire behavior predictions for the fuel models and representative weather conditions.

In the southern portion of the area, and primarily in the Farish Memorial USAF Recreation Area, openings and meadows are prevalent. Ground fuels in these openings and meadows are characterized by fuel model 1. These fuels have high rates of spread under relatively mild weather conditions.

The primary fuels within the Carroll Lakes WUI are forested land with some grass areas in the southern portions of the area. Fuel Models 8, 9, and 10 probably best depict the forested areas depending on the amount of dead and down material intermingled, the canopy closure and age (size) class of the timber. Fuel Model 8 depicts the aspen stands in the summer while Fuel Model 9 is more indicative of fall burning conditions in aspen. Fuel Model 1 best depicts grass lands.

Fuel Type 1

Fuel Model 1
Fire spread is governed by the fine, very porous, and continuous herbaceous fuels that have cured or are nearly cured. Fires are surface fires that move rapidly through the cured grass and associated material.



Fuel Type 8

Fuel Model 8
Slow-burning ground fires with low flame lengths are generally the case, although the fire may encounter an occasional "jackpot" or heavy fuel concentration that can flare up. Only under severe weather conditions involving high temperatures and low humidity's, and high winds do the fuels pose high hazards. The thinned and cleaned up stands represent this model.

Fuel Type 9

Fuel Model 9
Fires run through the surface litter faster than model 8 and have longer flame height. Concentrations of dead-down

woody material will contribute to possible torching out of trees, spotting and crowning. The pure stands of aspen represent this model. In the fall, after the associated grass and forbs have cured, this fuel will burn more intensely and is temporarily more of a threat.

Fuel Model 10
The fires burn in the surface and ground fuels with greater fire intensity than the models 8 and 9. Dead-down fuels include greater quantities of 3-inch or larger limb wood resulting from over maturity or natural events such as mountain pine beetle that create a large load of dead material on the forest floor. Crowning out, spotting, and torching of individual trees is more frequent in this fuel situation, leading to potential fire control difficulties. Within these types in most places there is dead material caused from blow down and insect mortality

Table 1: Carroll Lakes WUI Fire Behavior Predictions

FUEL MODEL	RATE OF SPREAD (FT/HR)	FLAME LENGTH (FT)	FIRE SIZE 2 HOUR (AC)	SPOTTING DISTANCE (MI)
1	11,000	6	3,700	0.4
8	224	1.5	1.5	0.4
9	1,000	4	30	0.4
10	1,617	9	14	0.4

Note: These predictions are based upon renderings of Pickle Gulch Remote Automated Weather Station (051901) weather during high–extreme fire danger.

Local topography further aggravates fire behavior and control. Prevailing west winds are funneled through the communities involved. Slopes range from ten to over fifty percent with most hillsides ranging from twenty to thirty percent.

The area is dominated by highly erosive, decomposed granitic soils. An unlikely severe wildfire within the WUI boundary would threaten the high quality fisheries in the community's lakes. Natural Resources Conservation Service Soil data show that 90% of the soil in the WUI are highly susceptible to damage by wildfire.

Local Preparedness to Respond

Carroll Lakes Community is not in an established fire protection district. It is under the El Paso County Sheriff Wildland Fire Crew (EPCS-WFC) in Colorado Springs which is about 20+ miles from the area and roughly has a 45 minute to one hour response time to the area. A 911 call from the Carroll Lakes area is routed to the EPCS-WFC and they will normally ask NE Teller County (NETCO) Fire Protection District (FPD) to respond.

NETCO FPD in Woodland Park is only 6.75 miles away and is by far the closest potential responder. Current understanding of existing agreements is that they will respond to fires in the Carroll Lakes area if they have available assets. Response time to Carroll Lakes is about 15 minutes. CSFCC has two 500

gallon water trailers equipped with pumps to draw water from on-site lakes and to aid in fire suppression until fire team arrive.

USFS has a type 3 and a type 6 engine and a 10 person fuels module stationed at woodland park work center. Additionally, Teller Co has a 21,000 gallon cistern South 307/300 junction (4 way).

CSFCC allows fire fighters to take water from the lakes for suppression.

Risk of Ignition and Wildfire Occurrence

Causes of Wildfire Ignitions

Data collected from wildfire responding agencies between 1999 and 2008 indicate that the cause of most wildfires was not determined. The most likely causes of wildfire ignitions are 1) equipment, 2) abandoned campfires, and 3) careless or thoughtless acts by people who smoke, set off fireworks, build open fires, etc. Camp fires and outdoor smoking is prohibited in forest lands during periods of high fire danger and year around within the Carroll Lakes Community. Likewise, shooting is prohibited in the Carroll Lakes WUI area.

Reconstruction of fire history and forest dynamics in the neighboring upper South Platte landscape, which is located immediately north and west of the community, reveal (i) an average fire interval of 20-50 years during the period 1300-1880, but no major fires between 1880 and 2002; (ii) a mix of non-lethal surface fire and a lower proportion of stand replacement fire in the historic burns (mixed severity fire regime); and (iii) a striking increase in forest density from 1900-2002.

The extent of the high-severity Hayman burn in 2002 just north and west of the Carroll Lakes landscape was unprecedented in the last 700 years, in part because of the dense forest conditions that had developed during the twentieth century, and in part because of the extreme drought and fire weather conditions that existed in 2002. Similar drought conditions contributed to the Waldo Canyon fire a decade later.

Low fuel moistures and relative humidity are common in the area, as are periods of high winds. When dry and windy conditions coincide the stage is set for large wildfires. Human population is increasing in the area. All recent large fires were caused by humans. Numerous fires are ignited each year by lightning. Except for portions of Florida, this area has some of the highest occurrence of lightning in the continental US.

Fires originating in or near communities are the most immediate concern, but fires starting well beyond the boundaries of the planning area can have profound effects upon the communities. Areas classified as high to moderate fuel loading are the most worrisome.

Factors Affecting Homes in the Wildland/Urban Interface

Fire Behavior at any time is dependent on three factors: weather, topography and fuels.

Weather: Weather influences fire behavior as both a long term and transient phenomenon. Long term weather trends such as extended drought increase the possibility of ignition and increase the rate of fire spread.

Large plants, trees and larger shrubs, recover moisture content slowly after a prolonged drought, and may remain drier than normal for several years after a drought ends. Grasses and herbaceous fuels may recover moisture quickly after a short rain, but also loose moisture quickly after short dry periods.

The intensity and spread of a wildfire is also affected by the weather conditions existing at the moment. For example, a large thunderstorm about 20 miles north of the Waldo Cañon Fire was responsible for pushing the fire down downslope into the Mountain Shadows neighborhood. High temperatures, low humidity, and strong winds increase the probability of ignition, intensity and rate of spread. Wind direction at any given moment is the primary determinant for the direction of fire spread.

Topography: Topography includes the degree of slope and the shape of the terrain. Hot gases rise in front of the fire along the slope face, pre-heating the vegetation above a fire. As slope increases the effect of the preheating and increased spread increases, and fires may move up to sixteen times faster with flames twice as long than a fire on level ground.

Drainages act as chimneys that funnel heat and winds up the drainage. Homes in drainages, or at the tops of drainages, are particularly vulnerable to wildfires. The direction a slope faces, or its aspect, also influences fire behavior. South and west facing slopes tend to be drier and thus, exhibit more intense fire behavior than moister east and north facing slopes.

Fuels: The two fuel types in a WUI are vegetative and structural. Vegetative fuels consist of living and dead trees, bushes, and grasses. Typically, grasses ignite more easily and burn more quickly but with less intensity than trees. Fires can move quickly through grass and herbaceous vegetation, and these smaller fuels are often the kindling that moves fires to larger size fuels.

Any dead or living branches on the lower eight feet of trees or shrubs between 6 and 18 inches tall underneath trees are called ladder fuels. Ladder fuels help convert a ground fire to a crown fire (tree tops) that moves much more quickly and with more heat.

The length of flames is directly correlated with the amount of heat a fire produces. Flame lengths less than four feet can be attacked directly by hand crews, but flame lengths greater than four feet require indirect attack methods where firefighters must work a safe distance away from the flaming front.

Non-vegetation fuels include houses, ancillary buildings, fences, and firewood piles. Structures in the WUI can be considered as additional fuel. In fact a burning structure can ignite a wildfire, and defensible space can prevent a burning structure from spreading fire to the surrounding vegetation as well as preventing a wildfire from igniting a structure.

Nor are hazardous fuels around a home limited to natural vegetation. Landscaping is often a fire hazard. During wildfires, many homes are lost because of the vegetation planted around the structure. Juniper (Pfizer) shrubs planted near foundations, landscape timbers, wood mulches and wood fences are often sources of home ignitions. Landscapes should be planned with the threat of wildfire in mind.

The important point to remember here is that neither topography nor weather can be altered. *Only fuels can be manipulated before a wildfire to reduce fire intensity or influence the fire spread.*

How Structures Catch Fire

There are three ways that a wildfire can transfer itself from natural vegetation, or burning homes, to other homes. They are through radiation, convection, and firebrands.

Radiation: Wildfires can spread to a home by radiating heat in the same way a radiator heats rooms in the wintertime. Radiated heat is capable of igniting combustible materials from a distance of 100 feet.

Convection: Direct contact with flames, or the wildfire's convective heat column—the hot air and gasses rising from the flames may also ignite a home. This will most likely occur when trees or brush near a structure ignite and the flames touch a flammable part of the structure.

Firebrands: Firebrands are burning materials that detach from a fire during strong convection drafts in the burning zone. In most cases, the flame front passes quickly, but a shower of burning embers, or firebrands, impinges on the structure for some time before and after the flame front passes. Firebrands are most often the cause of home loss. Firebrands can be carried long distances – more than a mile – by the winds associated with a wildfire. Many homes in community are particularly vulnerable to firebrands.

A 2006 report by Traci Weaver emphasized the danger of home ignitions from burning embers.[1] Multiple wildfires raged across prairie and shrub land in North Central Texas from Dec. 27, 2005 to April 30, 2006. They killed 17 people, burned 1.6 million acres, and destroyed 440 homes. Many of the destroyed homes were made of brick, stone, and had metal roofs. Investigators pin-pointed the main cause of home destruction to burning embers that fell on top of, or were blown under, wooden porches without screening. Other losses were linked to firebrands entering attic vents, eaves and soffits, or radiant heat of burning grass that ignited wood decks.

Prior to the Waldo Cañon Fire, the 2002 Hayman Fire burned 138,000 acres and 132 homes in 20 days. After Hayman, the homes burned were thoroughly studied to determine the manner in which they were burned. USDA Forest Service scientists Jack Cohen and Rick Stratton reported on the causes of home destruction in the *Hayman Fire Case Study*.[2] Surprisingly, 662 homes within the parameter of the fire were not destroyed. Many of the homes that survived did so without intervention by firefighters. The study objective was to determine if there were common factors among these surviving homes that might be helpful in preventing loss of homes in future wildfires.

They found that "torching" or intense crown fires within 30 feet of a structure destroyed 70 homes. If a house was destroyed but the surrounding trees did not burn, they assumed that embers or firebrands ignited it. Based on this logic, they concluded that 62 (47%) of the 132 homes destroyed in the Hayman Fire were ignited by surface fires or firebrands.

[1] Weaver, Traci, (2006): *Texas Fires Shed New Light on What it Meant to be Firesafe.* Texas Forest Service.
[2] Graham, Russell T., (2003): *Hayman Fire Case Study.* USDA Rock Mountain Research Station, Report RMRS-CTR-114.

Cohen and Stratton found that home destruction was related more to a house and its site-specific surroundings than to the context of the larger Hayman Fire. If the vegetation around a house al-lowed high intensity fires to burn near them, they did not survive. If the vegetation permitted only low intensity fires, the structures had a good probability of surviving. Flammability of roofs, siding materials, and other house construction features raised or lowered the risk of flames igniting homes.

Home construction and Vulnerability to Wildfire:

The construction materials, location and even the shape of a structure influence its vulnerability to wildfire.[3] It is not the intent of this CWPP to suggest extensive alterations to homes that already exist in the community. Understanding how home construction affects the vulnerability of the structure to a wildfire helps residents plan defensible space projects to compensate for construction differences. When remodeling or home improvement projects are done plans can be made to reduce the ignitability of the buildings.

Decks and roofs are the most vulnerable parts of a structure. If either burns, the home will be lost. They are most likely to catch windblown firebrands, and air currents are more likely to form eddies that trap heat and in the irregular surfaces found in roofs and decks.

Fire restive roofs are extremely important. *Wood shake roofs have been the cause of many home losses due to firebrands.* Roof material with a class A rating indicates the best resistance to fire. Many roofing materials are available to homeowners but they vary in cost, weight and longevity. Homeowners should consult with a reputable building contractor to determine which roofing material will best suit their needs. **It should be noted that many of our homeowners have installed metal roofs since the last update of this plan.**

Even the most fire resistant roofs require maintenance. The most important item is to keep the roof—and gutters--free of debris. Combustible debris such as leaves and pine needles may ignite from firebrands and start the home on fire even with a class A roof. Combustible litter is most likely to accumulate in areas where one shape meets another such as gables and dormer windows. Gutters will also accumulate debris. These same areas are most likely to accumulate firebrands because of eddies in wind currents during a wildfire. Combustible debris should be removed anytime it accumulates.

Many homes in Carroll Lakes have metal roofing that is a desirable roofing material. However home autopsies have shown that the small ridges in metal roofs where on panel over lays another can be openings where fire brands may collect directly on the plywood sub roof, leading to ignition of the plywood. The holes underneath such ridges should be plugged with caulking or a similar material.

The eves (the extension of the roof over the outside wall) are also vulnerable areas. Open eves, with the roof joists exposed, are particularly vulnerable because the irregular surfaces can trap hot gasses and fire brands. Enclosure of exposed eves (called a soffit) helps prevent this. It is best to construct soffits so that the lower edge of the soffit meets the wall at a 90^{o} angle. This reduces the amount of heated air and fire brands that might be trapped.

[3] Slack, Peter, (2000): *Firewise Construction: Design and Materials.* Colorado State Forest Service.

Vents, in roofs and foundations, are also areas of vulnerability, but are necessary to ventilate attics and crawl spaces to prevent moisture accumulation. During a wildfire, heated gasses and firebrands can enter attics or crawl spaces through vents. All vents should be screened with metal screening with openings of 1/8 inch or less. Soffit vents should be located as close to the edge of the eve as possible. Vegetation around foundation vents can create unintended vulnerability, particularly on the downhill side. Landscaping with noncombustible mulch within three to five feet of the foundation and underneath decks or porches is essential.

In addition to the roof, decks are extremely vulnerable to fire. The deck surface is exposed to fire brands and fire brands can collect underneath decks. Possibly the worst mistake any homeowner can make is to store any combustible material beneath a deck. Countless homes have been lost because of firewood, scrap lumber, even gasoline stored beneath a deck. Even motorized equipment, when left under a deck, with gas in the tank has caused home losses during fires.

Ideally the underside of decks should be enclosed with a non-combustible material. If that is not possible, covering the area under a deck with stone, concrete or rock mulch will make the deck safer. When decks are rebuilt use fire resistant materials.

Carefully consider the landscaping in the vicinity of decks as well. Avoid planting flammable shrubs, such as junipers, anywhere near decks. Potted plants or planters on decks may also increase the hazard. Even furniture with cushions or wooden frames may ignite from firebrands. The area of defensible space should be increased near decks, especially on the downhill side.

Fire resistance of windows and doors should be considered. If window glass breaks, firebrands will enter the house. The most fire resistant glass is low emissivity, tempered glass which withstands the heat of a fire for the longest period. Double pane windows last longer than single pane when exposed to the heat of a fire.

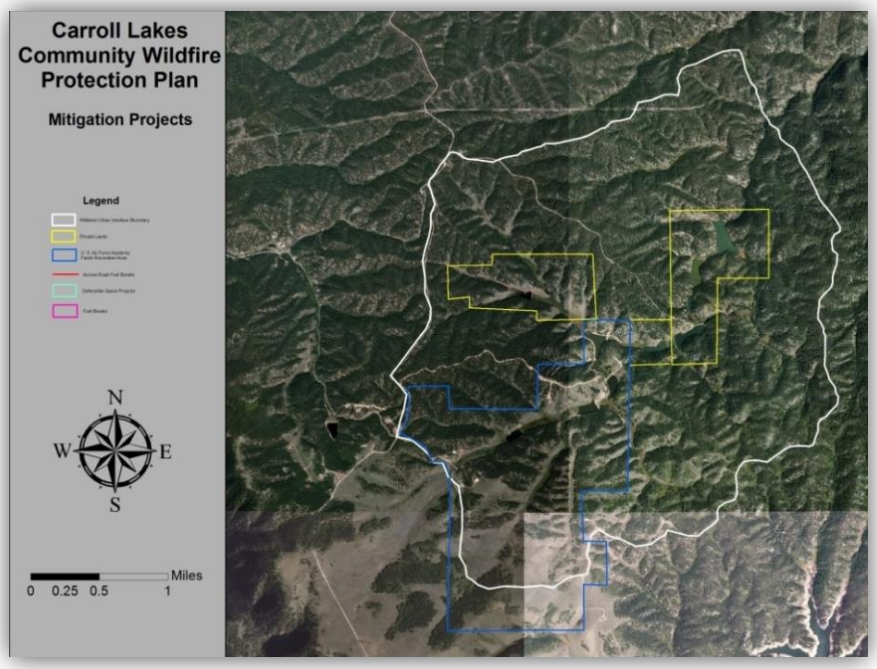
Window frames are also important. Metal frames offer the best protection. Vinyl frames usually do not burn but can melt when exposed to heat. Wooden frames will burn. Metal screening with on the outside of windows offers additional protection, but most windows are sold with nylon screening that will melt. Solid metal shutters offer the best protection, assuming the homeowner has the opportunity to close them before evacuating.

Wooden doors are obviously able to burn during a fire. The thicker the door the more resistant it will be. Metal doors are far superior, and glass in doors is subject to the same vulnerabilities as window glass. Well maintained weather stripping in outside doors will help prevent fire brands from entering a home.

III. COMMUNITY MITIGATION PLAN

In consultation with interested parties during the March 2005 meeting at Woodland Park, the fuel treatment map below was developed. It depicts the strategy for addressing mitigation needs in terms of fuel reduction within Carroll Lakes WUI. **As of this update, most of the planned mitigation work in the Carroll Lakes area has been completed.**

The strategy basically addresses fuel treatments and defensible space needs in numerous areas over a several year period. Twenty one (21) treatment areas on over 1,852 acres, and about 13 miles of shaded fuel breaks along travel-ways have been identified. The areas include private land, planned and proposed public land (Pike National Forest and Air Force Academy) parcels between the private parcels, and a series of "shaded fuel breaks" along travel routes and roads, existing 4x4 trails and a selected strategic ridgeline to break up fuel continuities. Over the near future, the USFS, Pike National Forest will be evaluating HR I and HR J to validate or modify the treatment unit boundaries and/or add more treatment units. In addition, several treatment areas on public land have been identified where work can be accomplished through the CSFS by using authorities contained in "Good Neighbor Agreements".



Essential to the success of the plan is the involvement of the private landowners. Implicit to the plan is "ownership of the fire problem" by private landowners. While CSFS and the local FPDs have worked hard to promote defensible space and land management, private landowners must accept responsibility for completing work on their own lands. Incorporated in the private land treatments is the task of working with individual landowners to improve defensible space in the ignition zone around the buildings. **Carroll Lake Community home owners have taken this task to heart over the last 10 years. Thanks to three cost sharing grants, most of the most vulnerable common areas have been treated and more that 50% of home owners reported fire mitigation in and around their individual homes in our 2023-2024 Firewise renewal application.**

Fuel Hazard Reduction

Defensible Space vs. Fuelbreaks:

In a broad sense there are two generalized categories of mitigation. First is defensible space thinning in the Home Ignition Zone around structures to increase the chance that the structure will survive a wildfire. Second, is fuel break thinning away from structures to reduce severe fire behavior and give firefighters a safer place to w
ork. Both approaches require thinning of the canopy and removal of ladder fuels. The approach will vary depending of the forest conditions existing on the area in question.

THE HOME IGNITION ZONE:

Modification of vegetation around a structure to reduce fire intensity is called defensible space. The term "home ignition zone" (HIZ) is defined as a structure and the surrounding vegetation. A structure's vulnerability to wildfire depends on the surrounding vegetation, including landscaping, and the structure itself.

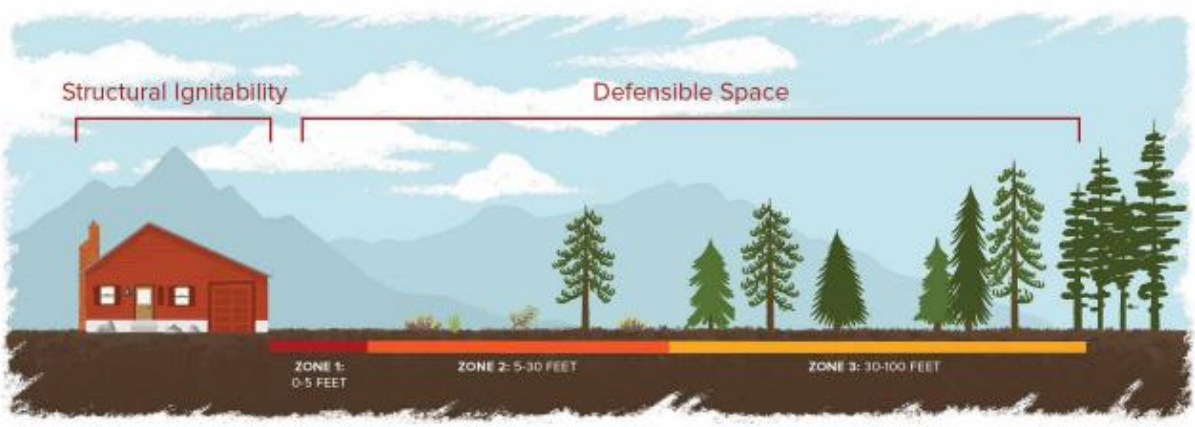


Illustration: Bonnie Palmatory, Colorado State University

Protecting Homes in the HIZ:

Thinning around homes is different than thinning for fuel breaks. Thinning in the HIZ is designed to protect structures from the heat of wildfires. Defensible space includes both thinning around structures to reduce the heat from burning vegetation and reducing flammability of the structures to protect them from wind born embers, radiation and convective heat. Further information about increasing the survivability of structures is found on the CSFS website at: http://csfs.colostate.edu/pages/pub-csfs2.html#wildfire .

Defensible space is defined as an area around a structure where existing vegetation is modified to slow the rate and intensity of an advancing wildfire. This includes selective removal of trees around structures in two or three concentric management zones. On slopes, increase the width of each zone on the downhill side. Fuels are reduced according to prescriptions for each zone.

Zone One: This is the closest zone to a structure, and extends 0-5 feet from the outermost edge of a structure including any decks. This zone requires the most vigilant work in order to reduce or eliminate ember ignition and direct flame contact with you home

While it is necessary to remove combustible material in zone one within five feet of foundations and under decks, it is not necessary to so elsewhere. Needles on the forest floor act as mulch retaining moisture in the soil, reduce erosion, and add organic matter to the soil as they decay. If regeneration of new trees is an objective, however, it is desirable to expose some bare soil since this will promote seed germination and establishment. *Raking up pine needles is not a substitute for thinning and ladder fuel removal.*

Zone two: This area extends 5-30 feet from the structure. It is the area transitioning away from the home where fuels should be reduced. This zone is designed to minimize a fire's intensity and its ability to spread while significantly reducing the likelihood a structure ignites because of radiant heat.

The main fuels reduction guideline for zone two is to thin the trees to an average spacing of 10-feet crown separation. Clumps of two or three trees may be retained in this zone if the space between the clump and the adjoining trees is at least 30 feet. All ladder fuels under trees should be removed. The branches of large trees should be pruned to a height of 8 feet above ground, but small trees should have at least two-thirds of the green needles remaining.

Firefighters must be able to escape quickly if conditions suddenly deteriorate. Zone two should extend along both sides of driveways for a width of 30 feet from each edge of the drive. This is important to allow safe access and egress for emergency vehicles. Adequate clearance should be maintained to allow access for large structural fire trucks. Twelve feet of horizontal clearance and 13 feet of vertical clearance should be maintained. At the end of driveways, adequate room for a large fire engine to turn around should be maintained.

Zone three: The area farthest from the home. It extends 30-100 feet from the home on relatively flat ground. Efforts in this zone are focused on ways to keep fire on the ground and to get fire that may be active in tree crowns (crown fire) to move to the ground (surface fire), where it will be less intense. The guideline for zone three is to thin the forest primarily to improve forest health. Spacing is less critical in this area but spaces should be made in the canopy. A useful rule of thumb is that a tree should receive sunlight from all four sides.

Silviculture and Wildfire Mitigation

Foresters manage trees not as individuals but in groups called stands. A stand of trees is defined as a group of trees that are similar with respect to age, species composition and other characteristics. Each stand is different from the ones nearby, and each landowner may have different objectives in addition to wildfire mitigation.

Thus, the information that follows is intended to be a general and highly simplified summary of the basic concepts of wildfire mitigation. It is only intended to give the reader an idea of how foresters approach the process of prescribing treatments for fire mitigation. When planning private fire hazard mitigation, an initial consultation with a forester is recommended. Specific prescriptions for any forest stand are best developed when the existing conditions of the stand and the landowner's specific objectives are known.

Although foresters may use many characteristics of trees to categorize them, the most common--and useful when discussing fire mitigation--is the tree's tolerance to shade. Shade tolerance means the ability of a tree to germinate and grow in the shade of other trees. Species of trees vary in their tolerance to shade, but they can be grouped by those that require sunlight for germination and those that require shade.

Shade Intolerant Trees

Shade intolerant trees are those that require full sunlight to sprout and grow to maturity. Shade intolerant trees are those that first colonize a site after a disturbance, such as wildfire, removes the existing trees. For this reason, ecologists call these pioneer species. Aspen, the most shade intolerant of local species, will send up new sprouts within days after a fire destroys the old trees. Shade intolerant trees common to this area include aspen and ponderosa pine.

It follows that if the trees in a particular area grow in following a disturbance, all the trees in a stand will be of roughly the same age. As the trees compete for sunlight, water and nutrients, the most vigorous become the dominant trees in the new stand. The dominant tree soon outgrows its siblings, yet the weak trees remain in the understory stunted and overtopped. Thus in shade intolerant stands, small trees are not young trees, but merely suppressed.

The ponderosa sections in this photo illustrate how tree diameter is not a reliable indicator of age. The center section is 100 years old; section 2 is 99; section 3 is 101; section 4 is 90; section 5 is 85; section 6 is 130; section 7 is 81. (Sculpture by Bill Wallace. Photo by Bill Buckman, courtesy of the Black Forest Slash & Mulch Program)

Following are some important species of shade intolerant trees with respect to fire mitigation:

Ponderosa pine: Of all the species of trees in the local area, ponderosa is the best adapted to survive a low intensity wildfire. First, the thick bark of the tree acts as insulation from the heat of the fire. Second, as the upper branches shade the lower branches, the low branches die, and in time, are broken off. Thus there are fewer low hanging branches to act as ladder fuels. Fires that burn in the grass and litter under a mature ponderosa rarely harm the tree.

Aspen: As noted earlier, aspen are the most shade intolerant of local trees. Unlike the ponderosa, aspen bark is thin and the tops of the trees are killed by even the coolest fire. The root system however is insulated from the fire's heat by the ground, and when the tree tops die, the roots respond by vigorously resprouting.

As a deciduous tree, aspen will not carry a fire in the tree crowns, thus fires drop to the ground in aspen stands. For this reason aspen are desirable trees to retain in fuel breaks and defensible spaces. Furthermore, aspen are desirable wildlife trees, and many stands are becoming shaded out by conifers due to years of fire suppression.

Since wildfire mitigation practices almost always require thinning, many landowners assume that aspen should be thinned as well, but they should not. Thinning aspen is rarely recommended since the falling trees wound the remaining trees. The bark on aspen is so thin that any wound will expose the tree to many different fungal diseases that are eventually fatal. Fire mitigation in aspen should be limited to

removal of dead trees if care is taken to avoid wounding live trees, cleaning up down dead wood, and removing conifer regeneration from the aspen understory.

Shade Tolerant Trees

Shade tolerant trees are those that will sprout from seed and grow in the shade of the existing forest canopy. Shade tolerant trees are usually found on the cooler moister north facing slopes of hillsides and in moist drainages. In fact, most shade tolerant trees require shading for the seedlings to survive. A seedling in direct sunlight will often be burned by the sun. As a result stands of shade tolerant trees contain trees of many ages. The most common shade tolerant trees in the area are Colorado blue spruce, Engelmann spruce, Douglas-fir, and white fir.

Spruce: Colorado blue and Engelmann spruce are so similar that they may be considered together for discussion of fire mitigation. Colorado blue spruce is usually found in lower altitudes (below 9,000 ft) while Engelmann spruce is usually found above 9,000 feet. The ability of seedlings to survive in the shade of mature trees usually creates dense forests with a closed canopy above and thickets of ladder fuels below. The typical fire regime in spruce is an infrequent stand replacing crown fire.

Spruces tend to be shallow rooted and excessive thinning of the upper canopy can result in wind throw in the remaining trees. Typically fire mitigation prescriptions for spruce require creating openings of one tenth acre or larger with clumped trees between the openings. Removal of small trees in the understory of the clumped trees reduces ladder fuel.

Douglas-fir: Typically Douglas-fir are found on cooler north facing slopes in lower elevations and mixed with spruce in higher elevations. It is in the lower elevation ponderosa pine forests where Douglas-fir has become the most serious concern for wildfire mitigation. After a century of fire suppression in lower elevation ponderosa pine stands the canopy has closed, shading the forest floor. As a result, Douglas-fir has invaded the understory of the ponderosa stands creating dense thickets of ladder fuels.

Douglas-fir are firmly rooted trees and can be thinned much the same as ponderosa pine. In lower elevation ponderosa stands most Douglas-fir should be eliminated, especially the ladder fuels. There is an important exception to this general rule where the ponderosa are infected with dwarf mistletoe. In such situations the landowner may choose to favor the Douglas-fir since they are immune to the ponderosa pine dwarf mistletoe. Special attention should be given to providing adequate separation between the crowns of larger trees and pruning the lower branches from the Douglas-fir to reduce ladder fuels.

Where Douglas-fir is intermixed with less wind firm spruce, they can be favored to maintain forest cover. It is still important to prune the trees to remove ladder fuels.

Thinning and Fuel Reduction

Foresters use many methods of thinning depending on the specific objectives of the landowner. Fuel break thinning is most often accomplished by a process called thinning from below. Trees are usually removed or remain based on their height in the canopy.

For simplicity, trees can be divided in three levels in the forest canopy. The largest trees at the highest level of the canopy are called dominants. These are usually the most vigorous since they have the largest root systems, most leaf area and receive the most sunlight. Next are the co-dominant or intermediate trees. These trees occupy the middle level of the canopy, but tend to be crowded and of smaller diameter. They are less vigorous with smaller root systems and fewer leaves as the result of crowding by the dominant trees. At the lowest level of the forest canopy are the overtopped trees. These are completely shaded by the dominant and co-dominant trees.

Thinning from below on the Black Forest School Section. These trees were first thinned in about 1980, and dense regeneration was thinned **again in 2008.**

As noted earlier, it is a common misconception in shade intolerant stands that the diameter of a tree is an indicator of its age. Often the co-dominant and overtopped trees are as old as or older than the dominant trees. In pure shade intolerant stands young trees are usually found in openings in the canopy, and can be recognized by having a diameter proportionate to the tree height, and a conical shape. If there are truly young trees in the stand it is desirable to leave some to increase diversity. Thickets of young trees should be thinned to give adequate growing space.

Thinning from below removes all of the overtopped and most of the codominant trees. It is essential when thinning for fuel breaks to remove ladder fuels and create enough openings in the forest canopy to reduce the crown fire risk. Thinning from below is desirable in fuel reduction projects because it 1) leaves the most vigorous trees on the site, 2) creates openings in the forest canopy by removing the less vigorous co-dominants, and 3) eliminates ladder fuels by removing the overtopped trees, shrubs, and pruning lower limbs of remaining trees.

Slash Treatments

Slash treatments will always be needed to clean up the residue from any forest thinning treatments. Untreated slash will only increase the fire hazard—possibly undoing all the good of thinning. It can also attract undesirable insects to the area—primarily ips beetles and turpentine beetles. Slash treatment may be the most labor intensive, and, thus expensive, part of any fuel mitigation project.

Lop and Scatter: This treatment consists of using saws or equipment to cut the slash into smaller pieces so that the height of the remaining slash is reduced, usually less than 12 inches high by 24 inches long. It may be the only practical treatment in areas where chippers are unavailable, prohibitively expensive, or in inaccessible locations. It is usually the lowest cost treatment since no special equipment, other than a chainsaw, is required.

The treated slash is left to decompose, and until it breaks down it will be unsightly. Over the course of several winters, snow pack pushes the slash down and it decomposes. Decomposition usually requires three to five years or longer if larger material was present. It also creates an extremely flammable fuel bed until it decomposes, which can be easily ignited, and burns with high intensities. It should not be used adjacent to high values, such as homes, or areas prone to regular fire occurrence.

Lopped and scattered slash can also lead to problems with ips or turpentine beetles. The beetles may lay eggs in green slash and the brood may emerge to attack living trees. This problem can be alleviated by doing any forest restoration treatments requiring this method in the fall and winter when the beetles are not active and by cutting slash into small pieces that dry out quickly.

Chipping: Chipping is the grinding up of the slash into small pieces, usually less than a few inches in diameter. Material can be chipped and left, or removed for off-site disposal or as a product.

It requires mechanized equipment to perform the chipping. The slash must be brought to the chipper, unless it is an expensive mobile chipping piece of equipment. Either way, it can quickly become a very expensive operation.

Chipping is a common method of slash disposal in the defensible zones around structures. Chips do not significantly contribute to fire hazard around structures since they produce low intensity fire behavior. Large piles of chips should be avoided as they could smolder for a significant amount of time however. Chips should be spread along the ground to a depth of less than four inches.

Chipping is an effective means of treating wood infested with bark beetles since the insects will not survive in the small bits of wood. Green slash that is promptly chipped will not harbor infestations of ips, turpentine, or other bark beetles. Chips also can pull nitrogen out of the soil, reducing the productivity of the ground.

Community Chipping Projects: Many communities have found that an effective way to promote mitigation is to sponsor a community chipping program. They have discovered that landowners are quite willing to undertake the effort of thinning trees if there is a simple low cost way to remove the slash. Community chipping usually consists of one of two approaches.

First is the community slash site where landowners may drop of the slash at a designated area. The slash is then ground and given away as mulch or used in some sort of reclamation activity. Most sites are open on designated days and manned by volunteers from the sponsoring community. Some slash sights that are not gated and are unmanned have reported some problems with illegal dumping, although this seems to be a rare occurrence. Rather than collection sites other communities have paid for roll off dumpsters to be placed at certain locations for collection of slash.

The second method is the drive by chipping program. The community contracts with a tree service or mitigation contractor to bring a chipper to the community on a certain day. Residents with slash to dispose of may drag it to the curb where the contractor will chip it on site. Commonly the chips are blown back onto the property. Usually an official from the homeowner's association or mitigation committee coordinates the program, and records the location of slash piles for the contractor.

Trampling, Crushing, or Roller Chopping: This is using heavy equipment, usually a dozer, to run over the slash, breaking it down in both size and height. It can be done with just the tracks or by also pulling a heavy, water filled drum with cutting blades welded on it.

It is very effective and can also crush and break up heavy fuels such as down logs. However, the slash must dry, usually for several seasons, to make this treatment truly effective. There is an increased fire hazard in the interim.

There is an additional benefit to crushing or trampling. The material is not only broken down, but also driven into the soil. This can add nutrients to the soil faster, create small pockets in the soil surface for holding water, and decrease the potential for erosion.

Pile Burning: Any form of open burning requires a permit. The sheriff in each county is by law the county fire marshal, but often the authority to issue burn permits is delegated to the local fire protection district. Anyone contemplating pile burning should check with the sheriff's office in the early planning stage to determine the proper procedure to obtain a burn permit. Burning must be done only under the conditions stipulated in the permit. In El Paso County where air quality is a problem, private land burning, is also regulated through the State Department of Public Health and Environment, and requires a smoke permit. The open burning page of the DOPHE website for the department is:
http://www.cdphe.state.co.us/ap/openburnfaq.html

Piles can be constructed with equipment or by hand. Piling with heavy equipment should only be done with a brush rake and not a regular blade. Piling with a regular blade will include significant amounts of dirt, which will make the pile harder to burn, create more smoldering and smoke, and will hold heat longer which adds to the risk of an escape at a later date.

For most landowners the slash is piled by hand and burned when conditions are safe—usually several inches of snow on the ground that will persist for a couple days. This will depend on what type of material is contained in the pile. Material greater than five inches will take longer to burn and will hold heat for more time. Piles burn best when they are relatively compact, contain material less than one inch in diameter, and the height is greater than the diameter. This arrangement promotes hotter burning and less smoke.

It is important that burn piles should not be located directly adjacent to or under the canopy of trees or other flammable material. Separation should be greater on the downwind side. It is easy to scorch living trees from the heat of the burning pile, even in winter. Avoid making burn piles on top of stumps. Stumps will smolder for extended periods of time.

Often piles must sit through the summer in order to dry, or piles from one season may be left over the next summer if proper burning conditions do not occur during the winter. In each case the dry woodpiles will sit through a burning season with the risk of ignition.

The fire should be monitored during the day and for several days thereafter. The center of a pile usually burns completely, but often wood around the edges does not. To ensure that the slash at the edge of each pile burns it is necessary to "chunk in" the piles periodically. This means that as the fire at the middle of the pile burns down to a low flame, wood from the edges should be thrown into the center to insure complete burning of all slash.

The burned slash pile must be monitored and may need to be cooled below the point of combustion, a process called "mopping up." This is especially important on south and west slopes where the snow melts off quickly and may be followed by dry windy weather.

For several years after a pile is burnt, an unsightly black ring remains where the heat of the fire scorched the soil. Many landowners find these unpleasant to look at. They may also present an opportunity for noxious weed to colonize the bare soil. Breaking up the burned soil with a rake and reseeding with native plants is recommended.

Maintenance

Survivable space, fuel break thinning, or any type of forest management, does not end when the initial project is finished. Continual maintenance is an essential part of any forest management program. Even in well managed forests trees will die, storms and wind will damage trees, and new trees will germinate.

Trees should be inspected every spring for any sign of damage from winter or spring snows or wind. Prune any broken branches if they are not too high in the tree, and trees bent by heavy winter snows should be removed. Check for any signs of insect activity or disease.

Late October is the best time to inspect trees for attack by mountain pine beetles. Beetles have finished attacking trees at this time, and there is adequate time to cut and treat the tree before the adult beetles fly the next July.

At five years check the canopy closure, especially in zones one and two. Remove any trees necessary to maintain openings in the canopy. Do any additional pruning or removal of trees and shrubs to eliminate ladder fuels.

Homes should be inspected each year using the guidelines shown at the end of this plan.
After ten years, dense thickets of young trees (regeneration) may have become established, and these will need to be thinned. Not all regeneration should be cut since trees of various ages are important for forest diversity. Young trees in openings with adequate room to grow should remain. Regeneration that is likely to become ladder fuel or crowded by other trees should be cut. Depending on their objectives, landowners may want to consider removing some of the larger trees to make room for the younger ones.

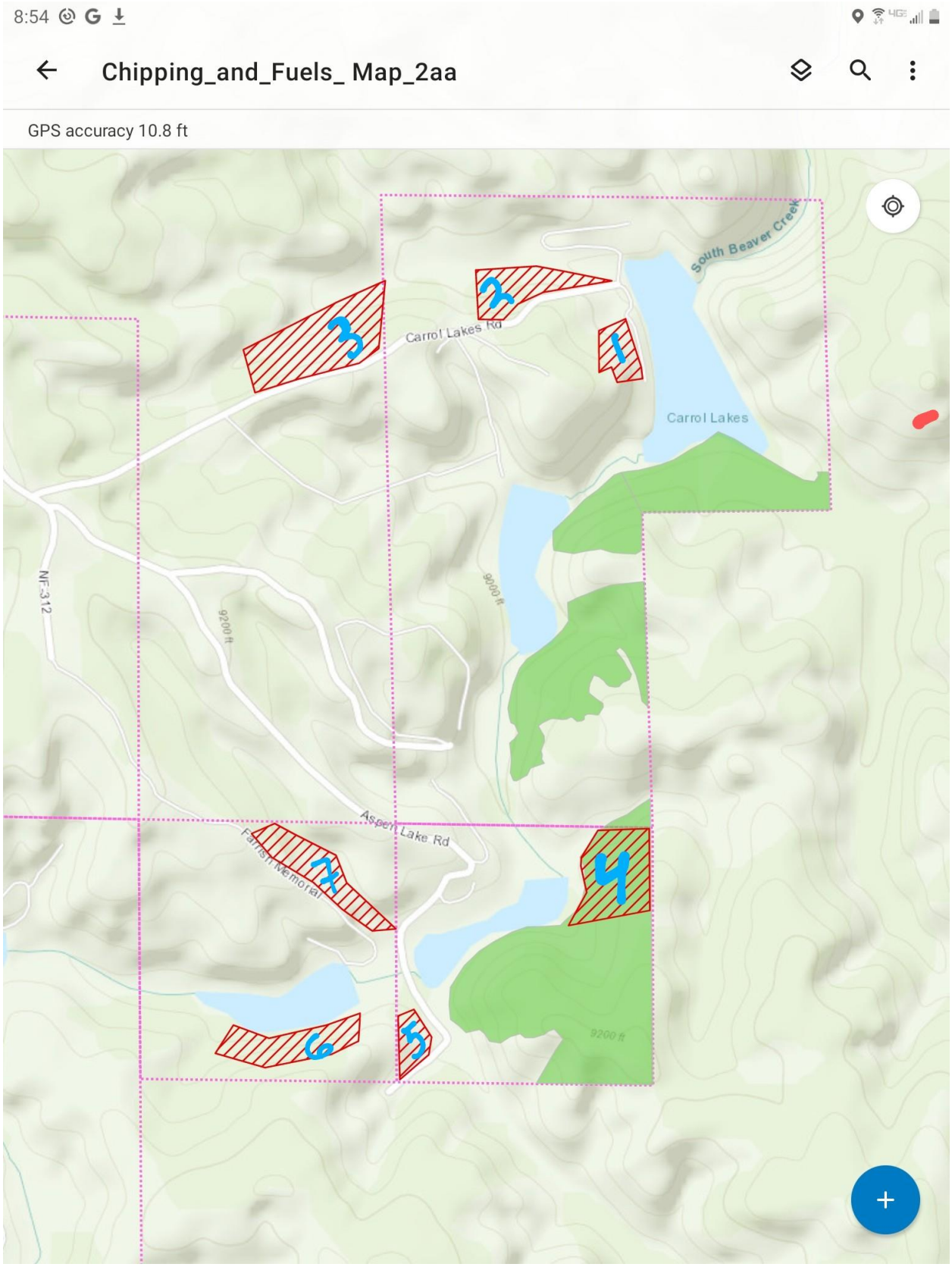
IV. IMPLEMENTATION AND MONITORING

Implementation

Most of the planned major mitigation work within and surrounding the Carrol Lakes Community has been completed. The current focus is treatment of approximately 5 acres within the community (see area 1 on map below) and ongoing maintenance of areas already treated. The table below shows our action plan as of 2023.

Carroll Lakes Community Firewise Action Plan

Action	Participants	Priority	2024	2025	2026
Conduct annual Firewise awareness training for members.	Resident Leader	1	X	X	X
At least 50% of members reporting fire mitigation work in/on home and surrounding areas.	Members	1	X	X	X
Treat approximately 5 acres proposed for a FRWRM grant. See area 1 on map below.	Caretaker, Resident Leader, CUSP	1	X	X	X
Survey common areas for mitigation needs.	Resident Leader, Caretaker, Regional Coordinator	2	X	X	X
Apply for fire mitigation grants as available	Resident Leader, Board of Directors	3	X	X	X
Update Wildfire Protection Plan	Resident Leader, Regional Coordinator	1	X		


8:54
Chipping_and_Fuels_ Map_2aa
GPS accuracy 10.8 ft
South Beaver Creek
Carrol Lakes Rd
Carrol Lakes
NF-312
9200 ft
Aspen Lake Rd
Forest Memorial
1
2
3
4
5
6
7

Fire Protection Goes Both Ways
Protect Your Cabin from an Approaching Wildfire
Protect the Community from a Fire in your Cabin

Things to Check and Do in and on your Cabin

- Chimney spark arrestor installed
- Inspection of roof; replacement of shingles as needed
- Inspection/repairs of eaves and soffits to ensure construction materials are in good condition
- Removal all flammable materials from under decks and porches
- Removal of debris between deck board gaps/joints
- Removal of debris on the roof and in the gutters as needed
- Replacement of missing deck boards to reduce ember entry to area under decks
- Replacement of vinyl gutters with metal gutters
- Replacement of wood fencing sections where attached to the house with a noncombustible product
- Resident or contractor labor to perform ignition resistant exterior improvements (e.g., new Class A roofs, mesh screening added to attic and crawl space vents, siding repairs, replacement of wood fencing attached to siding, etc.)
- Installation of weather stripping along the perimeter of garage doors to help keep embers out
- Use of a sealant (such as caulking) to cover gaps in open-eave areas
- Fire extinguisher inside cabin
- Follow manufacturer's fire safety instructions for electrical equipment
- Follow club rules regarding smoking and use of outdoor grills

Things to do Around your Cabin

- Clearing of debris at the base of combustible fences
- Clearing of vegetation beneath and around large stationary propane tanks
- Creation of a permanent non-flammable footprint under large stationary propane tanks
- Creation of a non-flammable footprint under decks with gravel, stone or concrete
- Creation of small fuel breaks by adding hardscaping (e.g., driveways, walkways/paths, patios, stone walls, etc.)
- Delimbing and removal of lower tree branches
- Relocation of firewood piles to at least 30 feet from the home and other structures
- Mowing lawns and trimming native grasses and weeds as needed
- Raking and removal of pine needles, leaves, and ground debris
- Replacement of combustible mulch material with stone/gravel
- Replacement of highly-flammable vegetation with fire-resistant species
- Reduction of ladder fuels
- Stacking/piling of slash and other debris for chipping or curbside pickup
- Thinning or removal of trees