

Lake Purgatory PO and Lake Purgatory WUI

Community Wildfire Protection Plan

February 2020



Prepared for: Lake Purgatory WUI

Prepared by: Wildfire Adapted Partnership

**Lake Purgatory Community Wildfire Protection Plan
Approval and Concurrence**

Approval

The Durango District of the Colorado State Forest service has reviewed this Community Wildfire Protection Plan and approves its content and certifies that it meets or exceeds CSFS Community Wildfire Protection Plan Minimum Standards.



Mark Loveall, District Forester

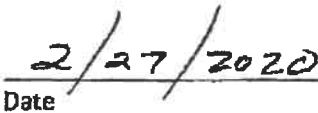


Date

The following entities have received a copy of this Community Wildfire Protection Plan and agree with and support its content and recommendations.



President, Lake Purgatory POA Board



Date



Hal Doughty, Chief, Durango Fire



Date



Butch Knowlton, La Plata County,
Director of Emergency Management



Date

Lake Purgatory Community Wildfire Protection Plan

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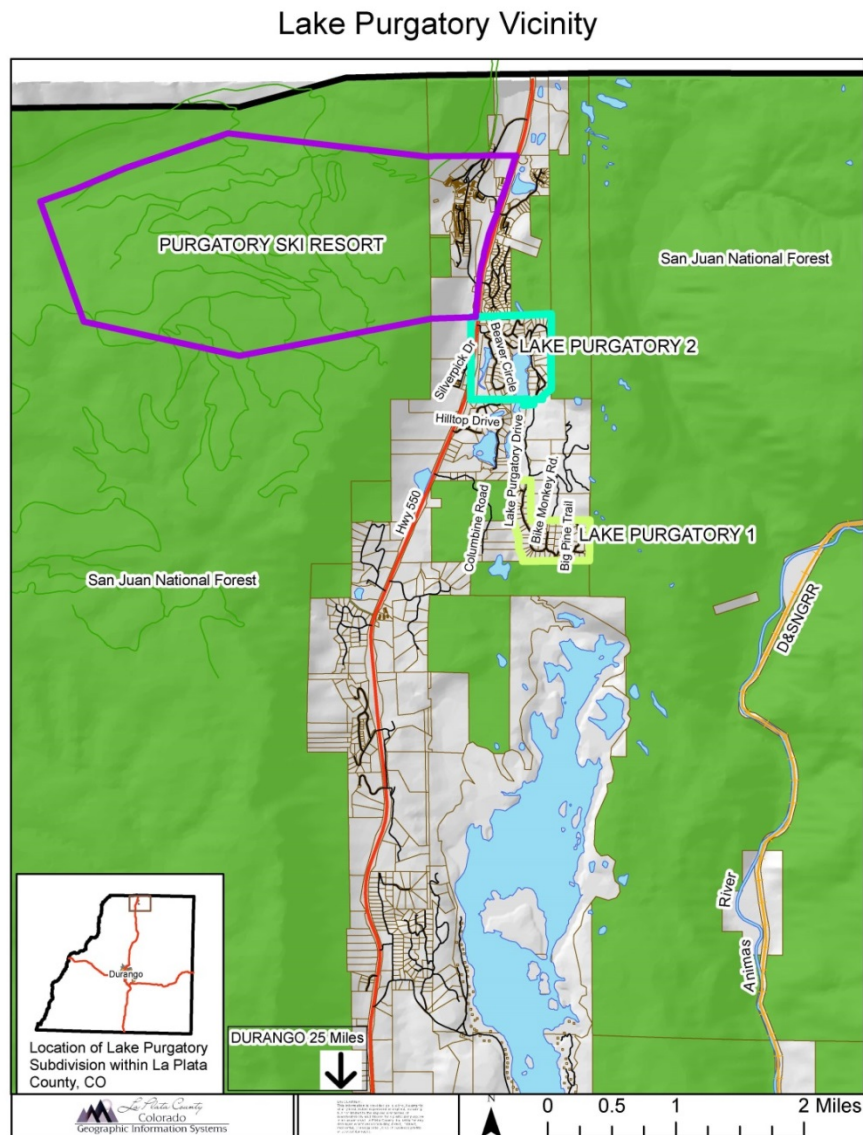
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1. INTRODUCTION

Community Wildfire Protection Plans are authorized by the Healthy Forests Restoration Act (HFRA) of 2003. HFRA places renewed emphasis on local community wildfire protection and response planning by extending a variety of benefits to communities with a wildfire protection plan in place. Among the benefits are the abilities to participate in establishment of fuels treatment priorities for both federal and non-federal lands surrounding communities, establishment of a local definition and boundary for the Wildland-Urban Interface (WUI), and enhanced opportunities for cost-sharing of community-based fuels treatments.

The Lake Purgatory Community Wildfire Protection Plan (LPCWPP) tiers to the La Plata County CWPP and provides further strategic and tactical direction specific to wildfire protection and mitigation for the Lake Purgatory community.



Lake Purgatory Community Wildfire Protection Plan

2. BACKGROUND

A. Location

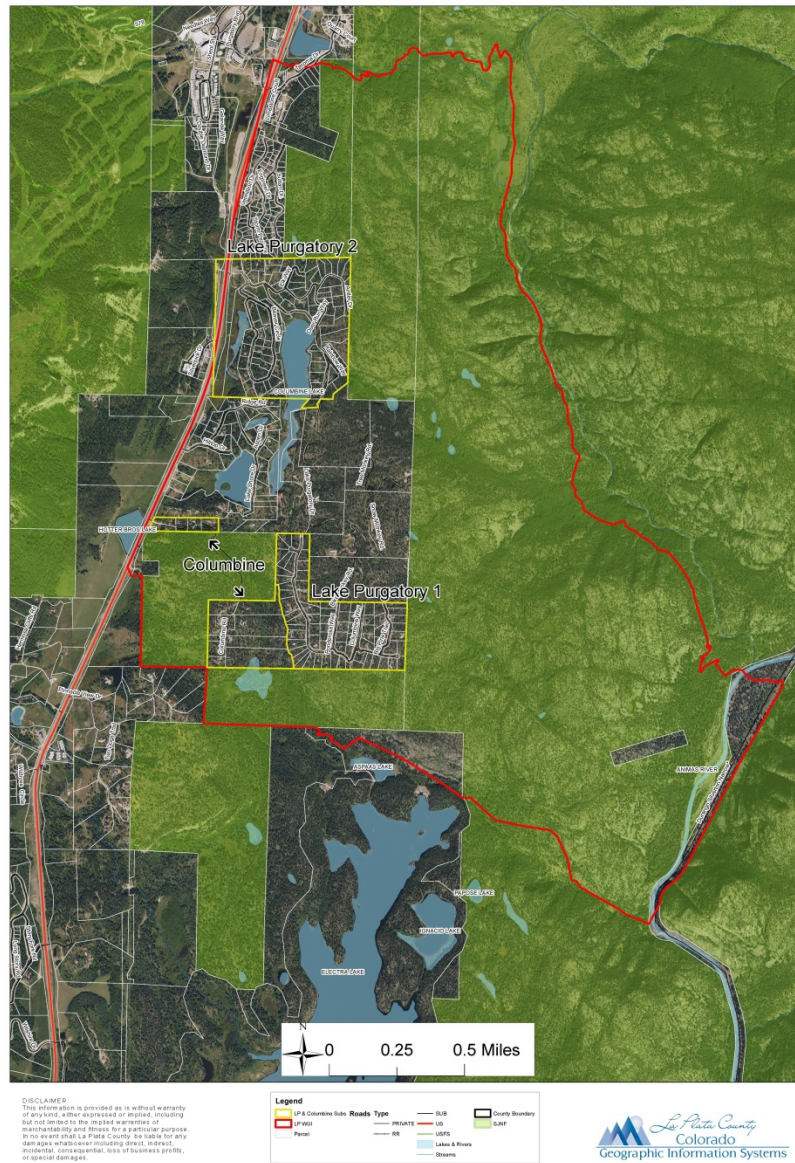
The LPCWPP was initially planned for the Lake Purgatory Property Owners Association (LPPO). LPPO was formed to manage the properties within the Lake Purgatory Unit I subdivision (Unit I) in northern La Plata County, Colorado. This CWPP now includes other developments within the geographical area known as Lake Purgatory Wildland-Urban Interface (LPWUI).

The LPWUI discussed here is composed of Unit I, Unit II, and approximately nine other subdivisions, in addition to private property lying outside a subdivision, and a large acreage of U.S. National forest land. The CWPP is described as belonging to the Lake Purgatory WUI since Lake Columbine (colloquially known as Lake Purgatory) is central to all of the communities in question.

To view the population in the LPWUI covered by this LPCWPP, refer to **Appendix A**.

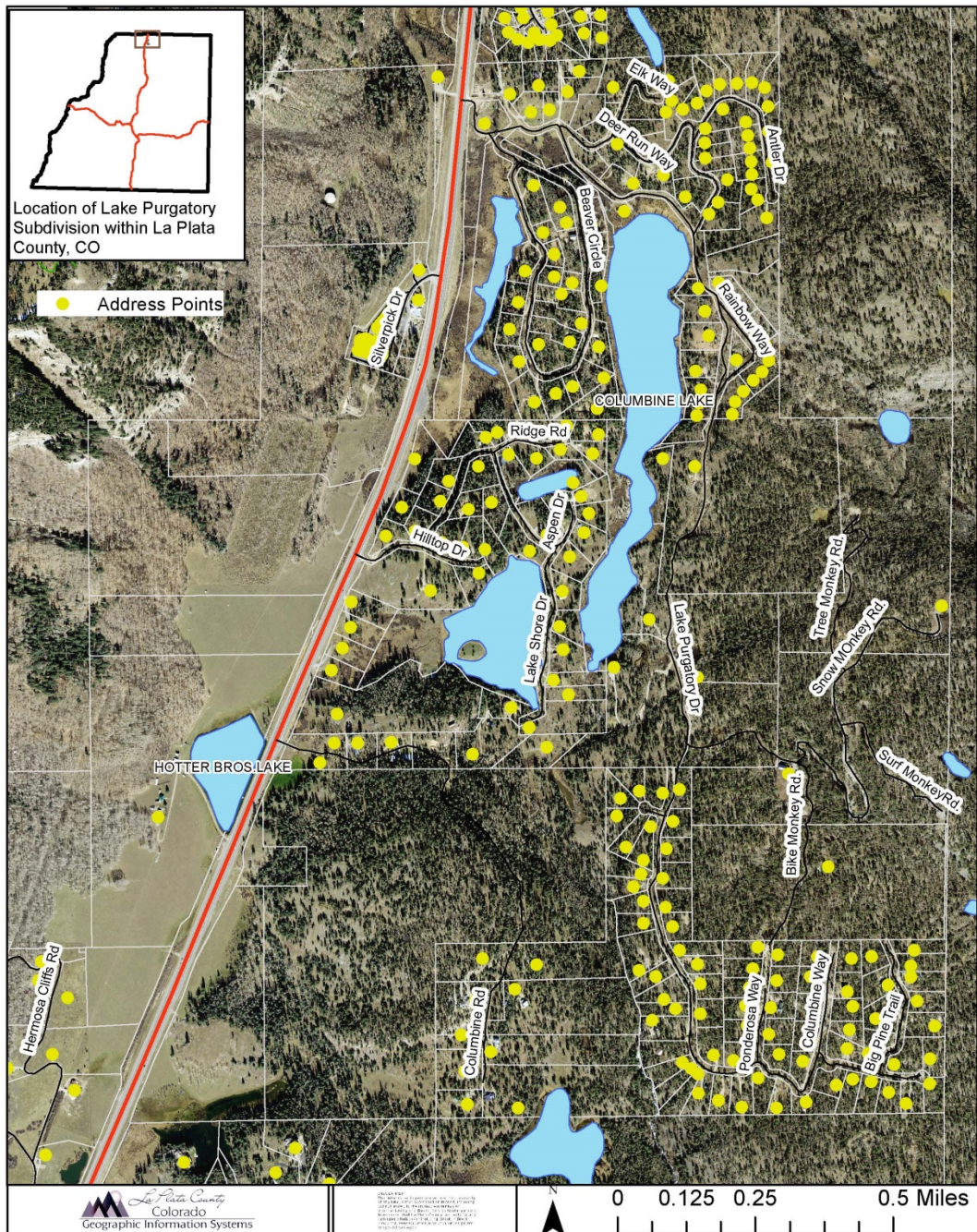
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Lake Purgatory WUI Area



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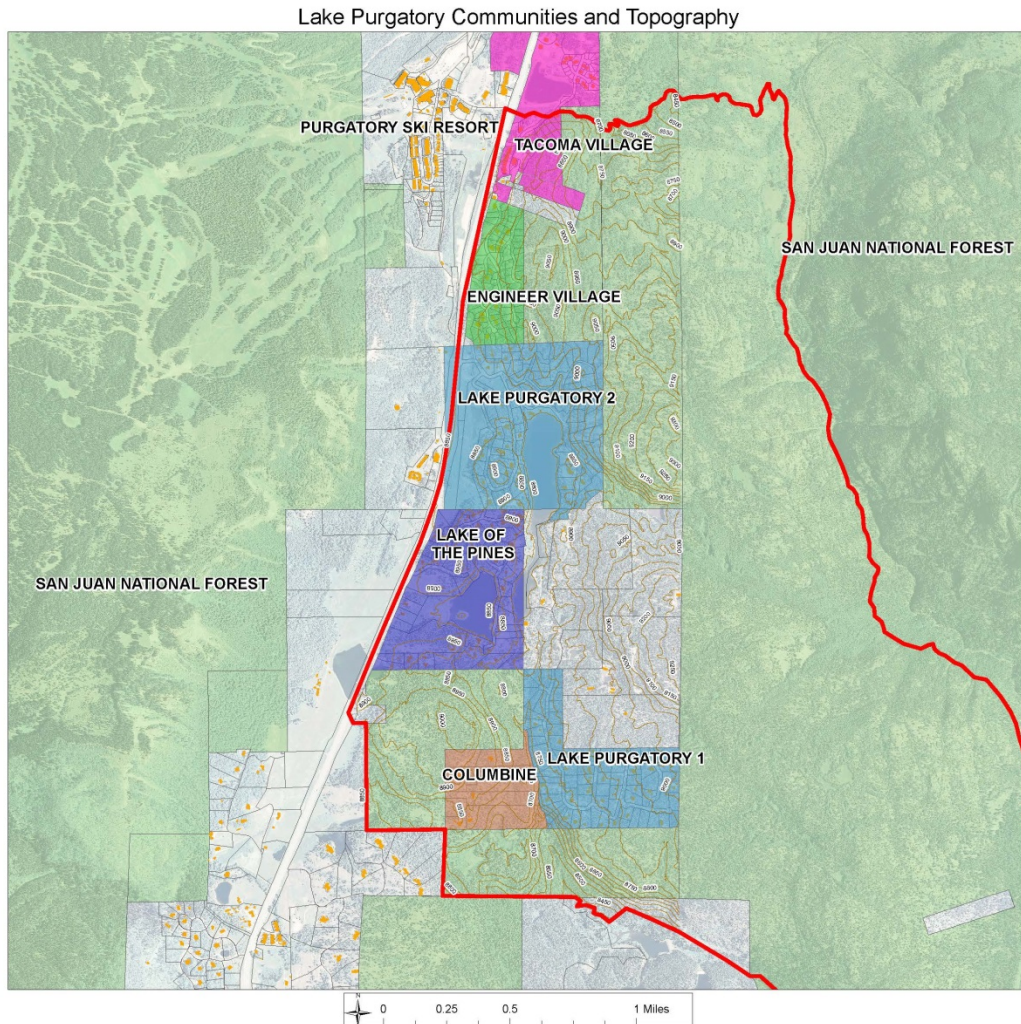
Lake Purgatory Location Map



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Lands within the designated LPWUI include the following subdivisions in part or in whole:

- Durango Mountain Resort (DMR)
- Tacoma Village CDP
- DMR Black Bear Townhomes
- DMR Tacoma Village Unit II
- Windom Peak Subdivision Unit I Ph. D
- DMR Engineer Village Ph. II
- DMR Village Ph. I
- Lake Purgatory Unit I
- Lake Purgatory Unit II (includes Beaver Circle)
- Columbine Subdivision, and
- Lake of the Pines Subdivision



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Lands within the LPWUI but not a part of a subdivision on the La Plata County GIS site include properties owned by Patrick Sean McCormack and National Forest Lands.

The LPWUI is comprised of approximately 2,600 total acres, or 4 square miles. Approximately 768 acres (30%) of the LPWUI is privately-held and the other 1,779 acres (70%) a part of the National Forest.

The community is located in the Animas River Valley at an elevation ranging from approximately 7,500 feet to 9,300 feet, with an average elevation of about 8,800 feet.

The general topography of the LPWUI is mountainous with widely varying slopes. In most areas bedrock is within a few feet of the ground surface unless fill has been placed. The uphill side of the of the residential areas lies in the east, giving wonderful views of the Hermosa Cliffs that top out at over 10,000 feet above sea level. In the southern part of the LPWUI, homes are served by wells and septic systems. Utility services for the northern Durango Mountain Resort (also known as Mountain Capital Partners, or MCP) subdivisions include domestic water and sewer. Major view highlights include the Hermosa Cliffs to the west with Castle Rock and Purgatory Ski Resort as features, Engineer Mountain and Potato Mountain to the north, the Twilight and Needles Mountains to the east, and the open valley view to the south towards the City of Durango.

Purgatory Creek and Cascade Creek border the north side of the LPWUI and Little Cascade Creek flows through the community. The Animas River forms part of the eastern border of the LPWUI. Lakes include Columbine Lake (Lake Purgatory), Lake of the Pines, and other small mountain lakes.

Animals native to the LPWUI include moose, elk, mule deer, American black bear, mountain lion, lynx, coyote, Rocky Mountain sheep, marmot, innumerable small squirrels and rodents, skunk, raccoon, porcupine, and opossum. Birds include eagle, osprey, hawk, raven, buzzard, turkey, quail, grouse, robin, magpie, Stellar jay, and many smaller birds.

See **Appendix B** for LPWUI Vegetation Map.

B. Community

US Highway 550 serves as the primary, and only, access to all LPWUI properties in its north-south run through the Animas Valley. The LPWUI properties begin just north of the Two Dogs development across US 550 from Hermosa Cliffs Ranch. Traveling north on US 550, the roads accessing the LPWUI include Columbine Road, Hilltop Drive, Lake Purgatory Drive, Engineer Drive, and Tacoma Drive. The north end of the LPWUI is directly across Highway 550 from the main entrance to Purgatory (previously Durango Mountain Resort). Land use within the LPWUI is residential. La Plata County GIS shows 369 private land parcels in the LPWUI.

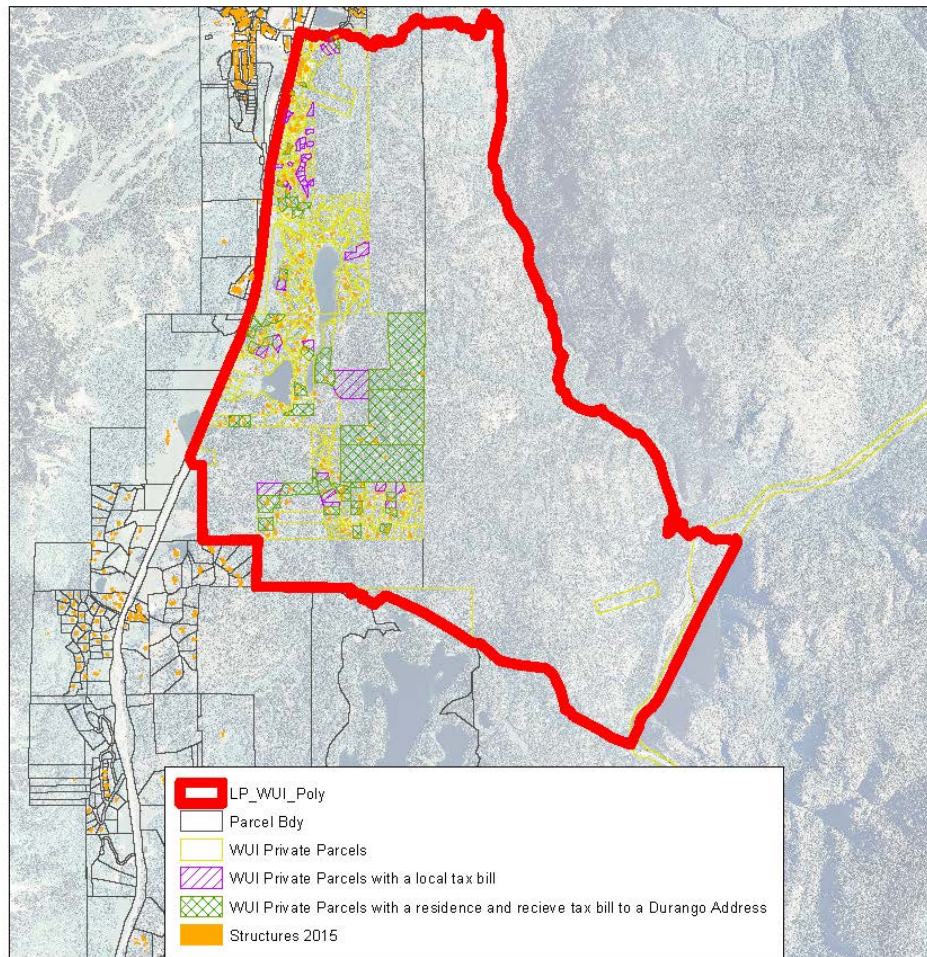
Seventy-seven of the parcels receive property tax bills to a Durango address, with some owners living within the LPWUI year-round. Forty-two of the 77 parcels have a structure on the parcel. The estimated population is 88 people, with the total estimated population in the high season potentially closer to 400 individuals. An average of six new homes are constructed yearly in the

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community. For the Lake Purgatory CWPP WUI project area, it is estimated that 95.5 % percent of the total project area population live within the WUI.

The residential structures in the LPWUI are mostly roofed in asphalt shingles or metal. Siding materials include wood, cementitious board, and stucco, with some stone and metal siding. Many homeowners use wood stoves for main or supplementary heat, and firewood piles are a potential hazard. Compared to other alpine residential areas, the structures have a moderate level of fire risk; however, no emphasis is seen encouraging fire resistant construction in current covenants and bylaws. Approximately 15% of properties with structures in the LPWUI have had some mitigation effort, and about 2% of the vacant lots have had some mitigation effort. There is an ongoing effort to halt the spread of fir beetles and aspen insects/fungus for about 5 years. A cleanup of destroyed trees is continuously underway.

Lake Purgatory WUI Parcel Analysis



369 Private Parcels in WUI

77 Parcels receive tax bills to a Durango address,
potentially indicating a year-round local resident in the Durango area
42 of those 77 have a structure on the parcel,
potentially indicating a year round resident in the WUI area

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C. Local Fire History

No recent wildfires have occurred in the subdivision. However, large wildfires have occurred in La Plata County in similar fuel types over the past twenty years. Examples include the Missionary Ridge Fire (2002) that burned 76,000 acres of Gambel oak, ponderosa pine, aspen, spruce and mixed conifer and 56 homes south and east of the subdivision, and the 416 Fire that burned 56,000 acres of similar forest types in the Hermosa Creek drainage roughly 3 miles to the south. No structures were lost during the 416 fire; however, the entire LPWUI area was evacuated during the fire.

D. Recent Wildfire Preparedness Activities

October 2011 – Approximately 16 acres of land was thinned on Patrick Sean McCormack's property of mixed conifer forest.

May 2014 – LPPO Board initiated annual Bark Beetle Mitigation project to preserve the health of fir and spruce trees. The HOA purchased 100 MCH Beetle-Block pheromone packets, which were applied to individual properties at a rate of 30 to 40 packets per acre. Where the owner was not able to apply the packets by themselves, resident volunteers helped. Twenty-six properties were mitigated. LPPO began recruiting volunteer Neighborhood Ambassadors to participate in FireWise of Southwest Colorado meetings.

April 2015 – An Initial Core Group meeting determined the WUI boundaries and created a working list of our communities' Values at Risk.

May 2015 – The second year of the Bark Beetle Mitigation project had 31 properties mitigated using the same method as in 2014.

August 2015 – A "Field Trip" with the Fire Marshal, CSFS and FireWise is taken to survey prevailing conditions within our WUI and to make preliminary assessments of major concerns to create a prioritized action item list.

October 2015 – The first LPPO community-wide fire mitigation and slash collection project is conducted, including the use of an air curtain burner to dispose of the slash. FireWise funded the rental of the air curtain burner and Ambassadors staffed it.

May 2016 – LPPO Board initiated the third annual Bark Beetle Mitigation project; 1150 MCH Beetle-Block pheromone packets were purchased and applied, and thirty-nine properties were treated.

June 2016 – The Annual Meeting Notice was sent via first class mail to all LPPO property owners describing the Right-of-Way (ROW) project planned for the summer/fall of 2016. All owners were encouraged to participate by enacting mitigation efforts focused on Home Ignition Zones 1 & 2 within their properties. Additionally, a permission form asked for access to the first 20 to 30 feet of their properties along the ROW for the purpose of creating a shaded fuel break.

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July 2016 – CWPP Progress meeting was held to identify work that still needs to be completed and to assign responsibilities. Tom Clutinger, John Oxley and FireWise CWPP Coordinator Jen Stark attended the meeting.

July 2016 – At the LPPO Annual Meeting an extensive CWPP progress update was provided. Additionally, community education was provided regarding the importance of mitigating fire danger on all individual properties following the guidelines published in Quick Guide Series Fire 2012-1: “Protecting Your Home from Wildfire.” Brochures were provided. All property owners were encouraged to participate in the ROW Project and to provide their written permission for extending the shaded fuel break onto their properties. Much of the information presented at the meeting was included in the mailing of the Annual Meeting Minutes.

May 2017 – Lake Purgatory applies for a \$7,500 Kickstart grant through FireWise to fund the completion of the ROW mitigation.

September 2017 – LPPO planned and completed the construction of a shaded fuel break within Unit I to significantly reduce chokepoints along Lake Purgatory Drive, Ponderosa Way, Columbine Way, and Big Pine Trail.

October 2018 – FireWise of Southwest Colorado changes name to Wildfire Adapted Partnership.

November 2019 – Wildfire Adapted Partnership coordinates several CWPP updates and re-shares with partners for final approval and submission.

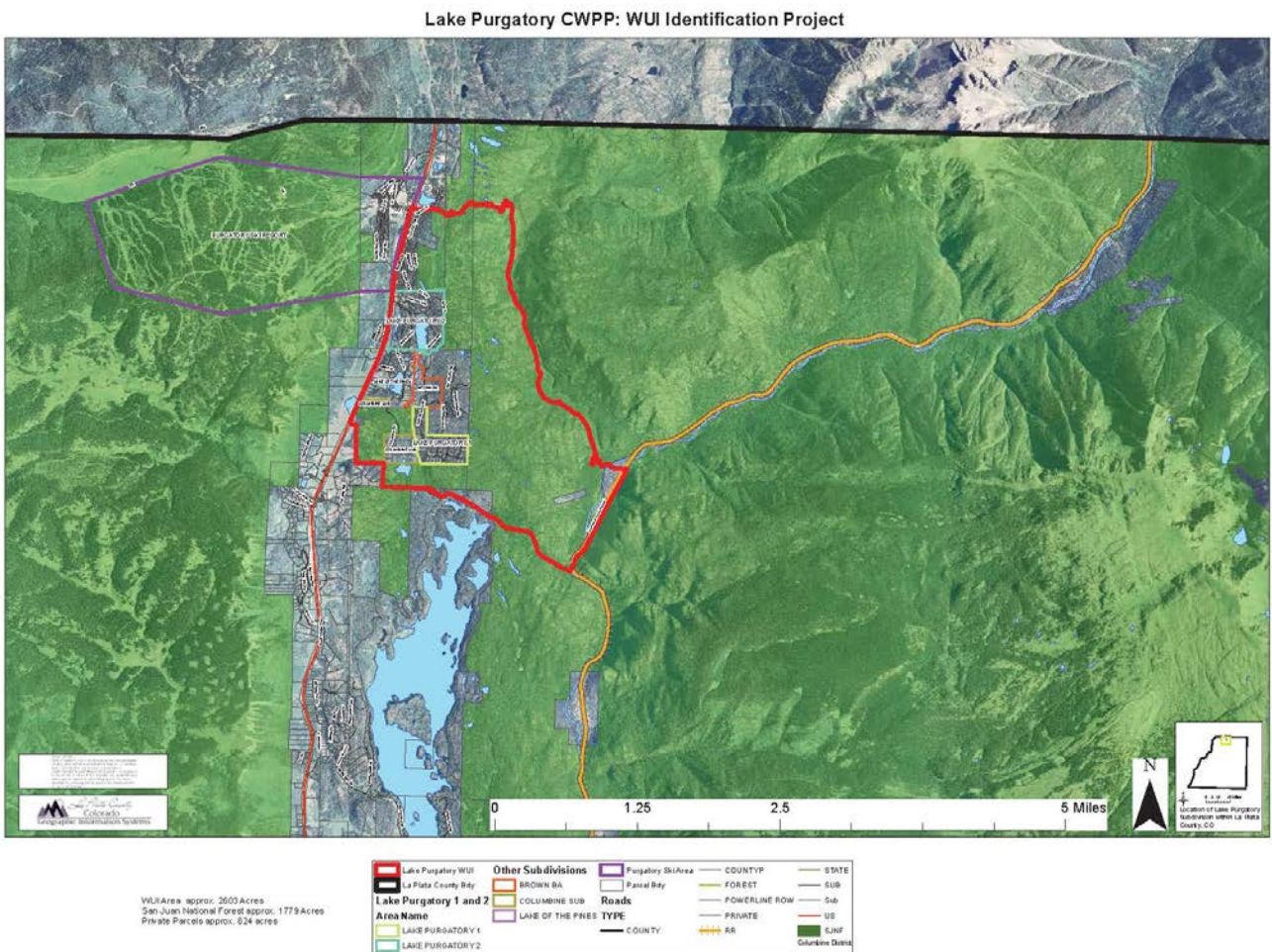
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3. PLAN AREA

A. Boundaries

The Lake Purgatory WUI boundary is comprised of the following:

- Highway 550, *west*
- Purgatory Flats Trail (Purgatory Creek) and Cascade Creek, *north and northeast*
- The Animas River and the Durango & Silverton Narrow Gauge Railroad (D&SNGRR) right of way (ROW), *east*
- The Old Stagecoach Road and the north end of Electra Lake, *south*



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B. Vegetation/Fuel Types and Characteristics

Vegetation in the Lake Purgatory WUI is comprised primarily of a mixed conifer forest type broken into two categories and three components. A cool/moist mixed conifer type comprised of a spruce/fir/aspen component in the center of the WUI, and a warm/dry mixed conifer type consisting of both a ponderosa pine with a Gambel oak/mountain shrub understory in the south and central portion of the WUI, with a Douglas-fir/aspen mix to the northwest.

Fire danger is variable within the mixed conifer forest and is primarily dependent on three factors: fuel makeup and loading, topography, and weather. While cool/moist mixed conifer types are generally less prone to ignition than warm/dry mixed conifer types, any stand can burn and experience crown fire when the conditions are right. Mixed conifer stands that are more open with less canopy closure and sparser understory fuels are more likely to experience lower severity ground fires with some individual tree and small clumps torching. However, the presence of slopes cause fuels to be preheated from fire below, making the tops of slopes, saddles, ridges, draws and canyons particularly susceptible to wildfire. The Animas River Valley experiences Southwest Colorado's predominant southwest wind direction, meaning that Lake Purgatory's location within the valley and general southwest aspect increase the risk of wildfire being funneled toward the community from below. Climatic conditions, such as thunderstorms, can also cause erratic winds and lead to unpredictable fire behavior including increased spotting and downslope fire progression.

See **Appendix C** for LPWUI Burn Probability and **Appendix D** for the Characteristic Rate of Spread.

C. Fire Protection

The Lake Purgatory WUI is served by the Durango Fire Protection District, which is staffed by both full-time staff and volunteer firefighters. A full-time staffed fire station is located 4.9 miles south (Station 15) of the intersection of Lake Purgatory Drive and Highway 550, and a volunteer station is located 1.2 miles to the north (Station 16). Each station houses an engine and a water tender. The main station is located within the city limits of Durango, approximately 25 miles south of the development. Response time for Station 16 is approximately 10 minutes provided volunteers are available. Response time for Station 15, with three personnel, is approximately 15 minutes.

Wildland fire response, outside the capability of the Fire District, is coordinated by the Durango Interagency Dispatch Center located at the San Juan Public Lands Center in Durango.

Fire hydrants are located in the Silverpick Lodge/Sow's Ear properties across US 550 from the WUI. The MCP developments at the northern end of the LPWUI have pressurized water systems with hydrants. No hydrants are available within Lake Purgatory Unit I subdivision, Lake Purgatory Unit II, Lake Purgatory Unit III, the McCormack properties, or any subdivisions or properties to the South within the WUI. No hydrants are available within the National Forest. Water from Lake Columbine (Lake Purgatory), Lake of the Pines, and several smaller lakes on the McCormack property and elsewhere would likely be available for fire suppression use if the DFPD can access that water. A hydrant, located at "The Nugget," a bar and gathering space, is

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found directly across U.S. 550 from Lake Purgatory Drive. The hydrant is served by water from the central water system at Silverpick.

Durango Fire Protection District is currently capable of providing a tanker shuttle of 750 gallons per minute. Residences within the LPWUI have a minimum firefighting requirement of 1000 gallons per minute based on adopted code. Homes greater than 3600 square feet or not accessible year round are required to have an automatic fire sprinkler system installed to offset the discrepancy in water required for fire suppression.

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4. PLANNING PARTNERS AND DESIRED FUTURE CONDITIONS

A. Partners

The initial Fire Safety/Mitigation Committee members from LPPO were named in July 2004 and included Tom Clutinger, Doug Scott, Jim Melot, and John Ickes. Durango Fire, Wildfire Adapted Partnership, CSFS and the BLM were involved in early meetings.

The Community has since received process and planning assistance as well as editorial input from the following individuals and organizations:

- Durango Fire Protection District
- Supervisory Forester, Colorado State Forest Service
- San Juan National Forest
- Bureau of Land Management
- Wildfire Adapted Partnership
- La Plata County Emergency Manager
- Residents of the LPWUI

B. Desired Future Conditions

This CWPP identifies a number of desired conditions for the community. Above all, **this community wants to make the LPWUI a safe and healthful environment for the residents, visitors, and emergency responders.** Recommended and desired conditions include:

1. **SAFER ACCESS.** Secure access with properly constructed, well-maintained and well-signed roadways. Actions include developing additional roadways which will allow dual egress and access for the developments served by Lake Purgatory Drive, Hilltop Drive, and Columbine Road. In addition, fuel breaks, turnouts, and continued maintenance along roadways with improved road signage are needed.
2. **DEFENSIBLE SPACE & THE BUILT ENVIRONMENT.** Make all homes, but especially new homes, more fire resistant with defensible space and fully accessible driveways. Actions include strengthening development HOA construction requirements and guidelines, improving the fire resistance of existing structures, development of defensible space around structures, and increased involvement of non-resident owners with fuels reduction on their properties.
3. **COMMUNITY FUEL BREAKS.** Improve fuel breaks by designation of fuel break positions and then followed by targeted mitigation.
4. **INSECT CONTROL AND FOREST HEALTH.** Reduce the vulnerability of the area to insect infestation and depredation. Actions include continued and enhanced insecticide and/or pheromone treatments and removal of destroyed trees. The community will also attempt to have surrounding public lands mitigated and thinned as necessary.
5. **WILDFIRE ADAPTED EDUCATION & COMMUNITY INVOLVEMENT.** Encourage all property owners to engage in securing the safety of the community. Property owners and interested parties will be referred to websites of Wildfire Adapted Partnership, the Colorado State Forest Service, the National Fire Protection Association's Firewise USA®, and the International Association of Fire Chiefs Ready, Set, Go program. Other actions include

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continued active participation in Wildfire Adapted programs and activities by Ambassadors, continuing education at the HOA level, outreach, and property assessments.

6. EVACUATION AND EMERGENCY RESPONSE. All residents should have established evacuation and emergency communication plans. Community plans should be coordinated with La Plata County Office of Emergency Management and the Durango Fire Protection District. Actions include keeping contact lists current, maintaining all-condition signage for egress, access, and hazards, and regular effective communication with our emergency responders in La Plata County. Homeowners will be strongly encouraged to obtain the reflective address signs offered by the La Plata County Building Department.

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5. POLICIES

A. Federal

The CWPP has been developed in response to the Healthy Forests Restoration Act of 2003 (HFRA). This legislation established unprecedented incentives for communities to develop comprehensive wildfire protection plans in a collaborative, inclusive process. Furthermore, this legislation directs the Departments of Interior and Agriculture to address local community priorities in fuel reduction treatments, on both federal and non-federal lands.

The HFRA emphasizes the need for federal agencies to collaborate with communities in developing hazardous fuel reduction projects and places priority on treatment areas identified by communities themselves through development of a Community Wildfire Protection Plan (CWPP). Priority areas include the wildland-urban interface (WUI), municipal watersheds, areas impacted by windthrow or insect or disease epidemics, and critical wildlife habitat that would be negatively impacted by a catastrophic wildfire. In compliance with Title 1 of the HFRA, the CWPP requires agreement among local government, local fire departments, and the state agency responsible for forest management i.e., the Colorado State Forest Service. The CWPP must also be developed in consultation with interested parties and the applicable federal agencies managing public lands surrounding the at-risk communities.

B. State

Individuals, estates and trusts may claim a subtraction on their Colorado income tax return for certain costs incurred in performing wildfire mitigation measures on their property in a wildland-urban interface area within Colorado. The subtraction is equal to either 50% or 100% (depending on the tax year) of the qualifying costs for performing wildfire mitigation measures. The total subtraction a taxpayer can claim per tax year is limited to \$2,500.

<u>Tax Years</u>	<u>Subtraction Percentage</u>
2014-2016:	50%
2017-2019:	100%
2020-2024:	50%

Additional information on who can claim the subtraction and which costs qualify can be found here: <https://www.colorado.gov/pacific/sites/default/files/Income65.pdf>.

The Colorado State Forest Service conducted a Statewide Forest Resource Assessment and released a Statewide Forest Resource Strategy in 2010. One of the themes for the Assessment and Strategy is “Protect Forests from Harm.” The identified threats relevant to LPWUI are:

1. Wildfire in the Wildland-Urban Interface.
2. Insects and Diseases Affecting Community Forests.

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The area around the subdivision has been identified on the La Plata County Communities of Concern map as having High Wildfire Susceptibility based on weather, historic fire occurrence, topography, surface fuels and canopy closure.

The applicable strategies identified to address the threats are:

1. Focus forest management activities to reduce impacts of wildfire, and forest insects and diseases.
2. Coordinate forest management implementation among all parties affected by the CWPP.
3. Advocate landscape approaches to protect communities.
4. Collaborate with land management agencies, fire protection districts and insurance organizations to develop improved standards that lead to protection of homes in the WUI.
5. Expand the use of the Colorado Good Neighbor Policy.

C. Consolidated County Annual Operating Plan

The counties, Federal land management agencies, Colorado Division of Fire Prevention and Control, Colorado State Forest Service and Fire Protection Districts in southwest Colorado operate under a Consolidated County Annual Operating Plan (AOP) for wildfire protection. This plan provides for mutual aid to assist with the management of wildfire incidents in southwest Colorado. The plan for mutual aid provides significantly enhanced initial and extended attack capabilities through the rapid mobilization of fire protection resources for managing a wildfire. The Consolidated County AOP outlines standard operating procedures and the level of participation and available resources of each party under the plan.

D. USFS and BLM Land and Resource Management / Fire Management Plan

The San Juan National Forest Land and Resource Management Plan, the BLM Southwest Colorado District-Tres Rios Field Office Resource Management Plan and associated Fire Management Plans describe the role of fire in the native ecosystems in southwest Colorado. These plans outline the strategies that the USFS and BLM will utilize to manage wildland fire and fuels on these federal lands in southwest Colorado. The San Juan National Forest and Southwest Colorado District-Tres Rios Field Office area Fire Management Plan (2007) specifically describes objectives and strategies to manage fire and fuels on federal lands near communities within the wildland-urban interface.

E. La Plata County CWPP

The LPCWPP tiers to the La Plata County CWPP revised and approved in July 2006. This plan is consistent with the goals and strategies described within and provides additional tactical recommendations specific to the LPWUI.

F. Lake of the Pines Community Assessment

See **Appendix E**.

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6. RESOURCE ASSESSMENTS AND TRENDS

A. Fuels and Fire Hazard

1. *Cover Types*

<35% Conifer Crown Coverage: Low Intensity – short duration: flames 5 feet high, higher flare ups rare; duration of highest flames brief; fire spread slow to fast, 1-4 acres per hour; spotting generally rare, short range. General Wildfire Hazard Rating: A (Low), but a shrub understory and/or steep slopes can increase rating to B (Moderate).

35 to 55% Conifer Crown Coverage: Moderate intensity – longer duration. Intermittent flare ups occurring to many feet above tree tops; short and medium-range spotting is common; behavior between flare ups similar to that in <35% crown cover class. General Wildfire Hazard Rating: B (Moderate), but a shrub understory and/or steep slopes can increase rating to C (Severe).

>55% Conifer Crown Coverage: High intensity – long duration; flare ups higher than tree tops frequent to continuous; spread up to several hundred acres per hour; fire front impassable; spotting several hundred yards common, possible to a mile plus. General Wildfire Hazard Rating: C (Severe).

2. *Fuel Models*

The major Fuel Models present across the Lake Purgatory CWPP area by cover type are:

Mixed Conifer with litter and short herbaceous understory – NFFL Model 8 / SFB Model TL8
This model is for clumpy to closed mixed conifer over story with moderate needle litter and light herbaceous understory. Spread rate is moderate (500 to 1200 feet/hour) and flame length two to three feet at 10 mph eye level wind speeds. Concentrations of fuels coupled with low fuel moisture, low humidity, high temperatures, and moderate to high winds can increase spread rates and intensities and move fire into the tree crowns.

Mixed Conifer with shrub and small tree understory – NFFL Model 9 / SFB Model TU1
This model is for the closed canopy mixed conifer cover type with moderate downed woody fuels and shrub components. Flame lengths are two feet and spread rates are 300 to 600 feet/hour. Interlocking tree crowns and the presence of concentrations of fuels coupled with low fuel moisture, low humidity, high temperatures, and moderate to high winds can increase spread rates and intensities and move fire into the tree crowns.

Ponderosa Pine with litter and grass understory – NFFL Model 8 / SFB Model TL8
This model is for clumpy to closed canopy ponderosa pine over story with moderate needle litter and light herbaceous understory. Spread rate is moderate (500 to 1200 feet/hour) and flame length two to four feet at 10 mph eye level wind speeds. It is similar to Mixed Conifer fuel model but is not as susceptible to torching due to fewer ladder fuels.

Ponderosa Pine with shrub understory – NFFL Model 9 / SFB Model TU1 (TU5?)

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This model is for clumpy to closed ponderosa pine over story with moderate needle litter and herbaceous understory. Spread rate is moderate (600 to 1200 feet/hour) and flame length 3 to 6 feet at 10 mph eye level wind speeds. It is similar to the Mixed Conifer NFFL9/SFB TU1 fuel model but is not as susceptible to torching and crown fire due to fewer ladder fuels.

Spruce-fir with grass and scattered shrub understory – NFFL Model 5 / SFB Model TU1

Fires are carried by the grass, shrub, and small tree understory. Rates of spread are and flame lengths are normally low. Ladder fuels can present opportunities for individual tree and group torching but crown fires are only likely with low fuel moisture, low humidity, high temperatures, and moderate to high winds.

Spruce-fir with moderate herbaceous and down woody understory – NFFL Model 10 / SFB Model TU5

The primary fire carrier is a moderate to heavy litter, shrub, and small tree understory. Ladder fuels are commonplace so the presence of concentrations of fuel of fuels coupled with low fuel moisture, low humidity, high temperatures, and moderate to high winds can increase spread rates and intensities and move fire into the tree crowns. Rate of spread ranges from 500 to 2000 feet/hour and flame heights from 3 to 7 feet. Fire movement is highly dependent on fuel moisture, wind, and topography.

Riparian – Moderate Load Broadleaf Litter – No NFFL Model / SFB Model SH3

The primary carrier of fire is broadleaf litter and small branch components. Spread rate and flame length are both low. Intensity is low but duration can be moderate due to the low spread rate. Fuels are normally receptive only in late spring before green-up or in the autumn during leaf-fall.

Mountain Shrub – NFFL Model 5 / SFB Model SH2

This model is the Gambel oak cover type. Fires carry through the shrub layer as well as the cured litter and dead woody material on the ground surface with moderate (greater than 8 miles/hour eye-level) winds and live fuel moisture less than 110%. Lighter winds and openings in the canopy will drop the fire to the surface. Intensity and duration is low to moderate. A complicating factor for this fuel model is the level of standing and down dead wood present due to past frost-kill in the oak.

Meadow/Grassland – NFFL Model 1 / SFB Model GR2

This model includes both native grass and agricultural pasture cover types under two feet in height. Fire spread is governed by the fine and continuous herbaceous material that is cured or nearly so. Fire will not readily spread when relative humidity is over 25%. Fires are surface fires that mover rapidly through the cured grass and associated litter. Fires can be intense if fuels are very dry but fire duration is usually short. Spread rate is high (up to 6500 feet/hour) and flame lengths can be four feet if very dry.

Fire is carried by the understory herbaceous layer or leaf litter. Dead logs on the ground will often be totally consumed. Spread rates and flame lengths are low, less than 100 feet/hour and one to two feet respectively at winds of 10 mph eye level.

Fuel Model References:

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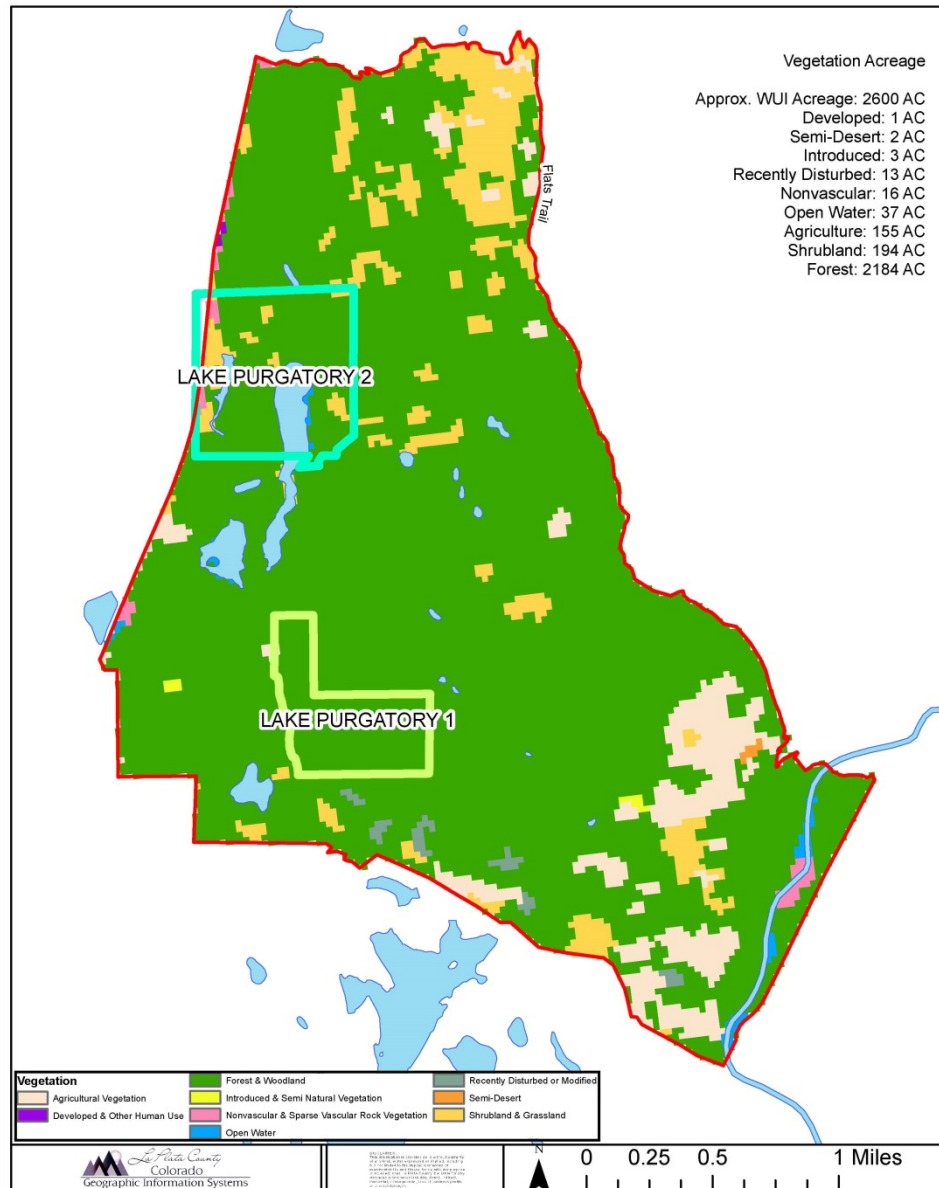
Aids to Determining Fuel Models for Estimating Fire Behavior, Hal E. Anderson, a publication of the National Wildfire Coordinating Group, General Technical Report INT-122, April 1982.

Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model, Joe H. Scott and Robert E. Burgan, USDA Forest Service, Rocky Mountain Research Station, General Technical Report RMRS-GTR-153, June 2005.

Note: The fuel model descriptions appearing here were comprised by Bruce Short, Short Forestry LLC and retired USDA Forest Service silviculturalist, for the Vallecito Community CWPP and were used with permission of author.

Lake Purgatory Community Wildfire Protection Plan

Lake Purgatory WUI Area Vegetation Analysis



3. *Slash Treatment*

Effective reduction of slash created by fuels mitigation is an important aspect of a fuels mitigation program. Piling and burning of slash is an effective treatment but usually requires snow cover or very moist conditions. Broadcast burning is also effective and more ecologically desirable since it can increase soil nutrients and provide good establishment conditions for desirable vegetation. However, broadcast burning requires a high level of technical expertise to accomplish.

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Chipping slash is an alternative to piling and burning but it can generate large chip piles that stay for years or chip depths across the landscape which are a fire hazard in themselves in dry years.

B. Values at Risk

This community values the protection of life for both residents and emergency responders and regards this as its highest priority. There are approximately 130 structures within the LPWUI, most of which are residential. The other structures include electrical and telephone utilities, water systems, septic systems, solar energy systems, access drives, and driveways.

Assets also at risk during a wildfire event include the community's natural surroundings, both flora and fauna. Natural assets of great value to Lake Purgatory include the protection of the watershed and wildlife.

A primary economic driver for the region is tourism, with many values located near the LPWUI, including Purgatory Resort (Mountain Capital Partners), the Durango & Silverton Narrow Gauge Railroad, the Animas River and countless recreational trails and Forest Access roads. During the 416 Fire in 2018, many of these assets were threatened, and the town of Durango and surrounding areas suffered economic losses when the Forest was closed and tourism reduced as a result of wildfire risk and firefighting operations.

C. Protection Capabilities and Vulnerabilities

This community is at risk from wildfire. A number of particular vulnerabilities have been identified:

- a. Access to Lake Purgatory Units 1, 2, and 3 is solely by Lake Purgatory Drive. Access is critical for emergency evacuation and emergency response. There are "choke points" on Lake Purgatory Drive where flammable vegetation near the road presents potential to close the single access. Road signage is insufficient.
- b. A similar condition exists for Lake of the Pines, where the sole access is via Hilltop Drive with vegetation near the road providing "choke points". Signage is inadequate.
- c. Similar conditions exist at the Columbine subdivision, where Columbine Road provides the same challenges.
- d. Very steep slopes ascending from the Animas River to the west and into the LPWUI, along with the rugged topography, provide an accelerated opportunity for fires from near the river to access both the USFS land and the developments. The use of the valley bottom by the Durango and Silverton Narrow Gauge Railroad (D&SNGRR) with its steam engines exacerbates the likelihood of fires starting at the bottom and moving up towards the settled areas. Two trains per day travel from May 1 thru September 30. D&SNGRR has recently mitigated the fire fuels along their ROW. D&SNGRR has a rail car following the train to extinguish starter fires, and maintains a dedicated helicopter to provide fire suppression as necessary. Pending the

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outcome of current litigation proceedings, the D&SNGRR could be penalized for potentially sparking the 416 Fire in 2018.

- e. Little Cascade Creek has eroded steep slopes which provide accelerated opportunity for fires from the nearby Electra Lake area to move to the North into the LPWUI.
- f. Purgatory Creek, and especially Cascade Creek, have eroded very steep slopes providing an accelerated opportunity for fires from North of the LPWUI to cross the USFS lands and move into the developments.
- g. Sources of water for fire suppression activities are limited. Currently, no system to use the ponds and lakes for firefighting exists, and the capacity to shuttle water using tanker trucks is inadequate. Only the MCP Lake Purgatory-sponsored developments in the north of the LPWUI and Silverpick have a pressurized water system with hydrants. In the south, wells are low flow and cisterns have small capacity; therefore, they are inadequate for firefighting.
- h. Most existing homes are not built to limit ignition hazards. Also, in many cases, the surrounding defensible space is inadequate.

D. Insects

Several native forest insects are currently impacting forest stands in the Lake Purgatory area that have a potential effect on wildfire hazard.

The Douglas-fir beetle (*Dendroctonus pseudotsugae*) and western spruce budworm (*Choristoneura freemani*) are both currently present; additionally, the spruce beetle (*Dendroctonus rufipennis*) is present in surrounding areas to the west and north, and is likely to impact Engelmann and blue spruce within the Lake Purgatory community in the near future. Douglas-fir beetle can often be spotted by the presence of pitch streamers running down the trunk of recently infested trees. Needles of infested trees change from green to yellow and then reddish-brown in the year following a successful attack. Extensive defoliation by western spruce budworm can predispose the weakened trees to Douglas-fir beetle infestation.

Western spruce budworm is a defoliating hairless caterpillar that feeds on the buds and needles of several native conifers, including Engelmann and blue spruce, white fir, subalpine fir, and Douglas-fir. Damage is often relatively minor unless it is recurrent year after year. Tufted branch tips and dead tops are indicative that the larval or caterpillar stage of the insect has been feeding on needles and the developing buds of the tree in the spring. By early to mid-summer, adult moths emerge to reproduce and the cycle repeats. Serious defoliation weakens the tree and can later result in mortality due to bark beetle infestation.

Spruce beetle is currently the most widespread and damaging forest insect in Colorado, with nearly 1.4 million acres impacted since 1996. The spruce beetle often becomes initially established in downed timber caused by wind events or avalanches, and then moves into standing live trees. The current epidemic on Wolf Creek Pass began after a large blowdown event. Spruce beetle typically has a two year life cycle and can be difficult to spot since

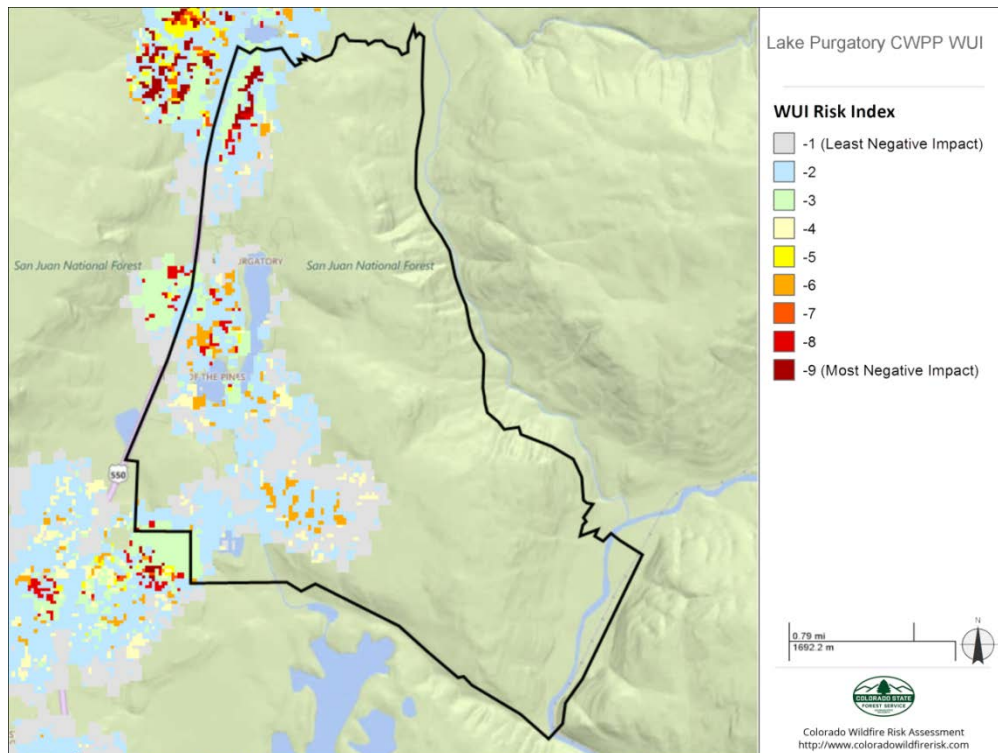
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infested trees can retain their needles for several years after being successfully attacked. The needles will usually not fade from green until a year or more following infestation, and then these needles appear to be off-color rather than the bright orange typical of bark beetle infestation in other varieties of conifers. Pitch streamers and exit holes from mature beetles leaving the tree after successful attack are probably the best way to identify spruce beetle infestation, although pitch tubes are sometimes evident as well.

Although stands of live green trees will readily burn when conditions are hot, dry, and windy, areas of beetle killed trees are especially vulnerable to high intensity wildfire while dead needles and fine twigs are still attached to the branches. This is attested to by the >110,000 acre West Fork Fire Complex that occurred on the San Juan and Rio Grande National Forests during the summer of 2013. With the passage of time, more beetle-killed trees will fall onto the forest floor, replacing the initial crown fire threat with surface fuels that can readily sustain a wildfire.

E. CO-WRAP Analysis

For the Lake Purgatory CWPP WUI project area, it is estimated that 84 people or 95.5 % percent of the total project area population (88) live within the WUI.



7.

MITIGATION ACTION PLAN

A. Education and Community Outreach

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The LPWUI will use social media and email to promote mitigation within all LPWUI entities, including establishing phone trees and emergency contacts. LPPO will help guide other subdivisions through the organization of wildfire committees or HOA structures.

Outreach will serve to encourage support for larger community-wide projects and treatments on public lands adjacent to private property. Additional methods will include community meetings, workshops, mailers, and evacuation trainings.

Recommendation	Priority Level	Timeline
Encourage private property mitigation	High	Ongoing
Execute Facebook, website, email and publicity postings in support of CWPP activities	Medium	By June 2020
Connect all LPWUI entities	High	By June 2020
Establish and update budgets; determine grant availability	Medium	By June 2020
Submit and obtain approval of CWPP document	High	By June 2020
Implement system for CWPP filing and record maintenance	Medium	By December 2020
Non-LPPO areas to organize HOA structures and wildfire committees; implement communications, contacts and procedures	High	By December 2020
Apply for Firewise USA® community recognition	High	By December 2021
Write modifications for CWPP	High	By June 2023
Review, revise and re-submit CWPP	High	By December 2023

B. Vegetation/Fuels Management Priorities

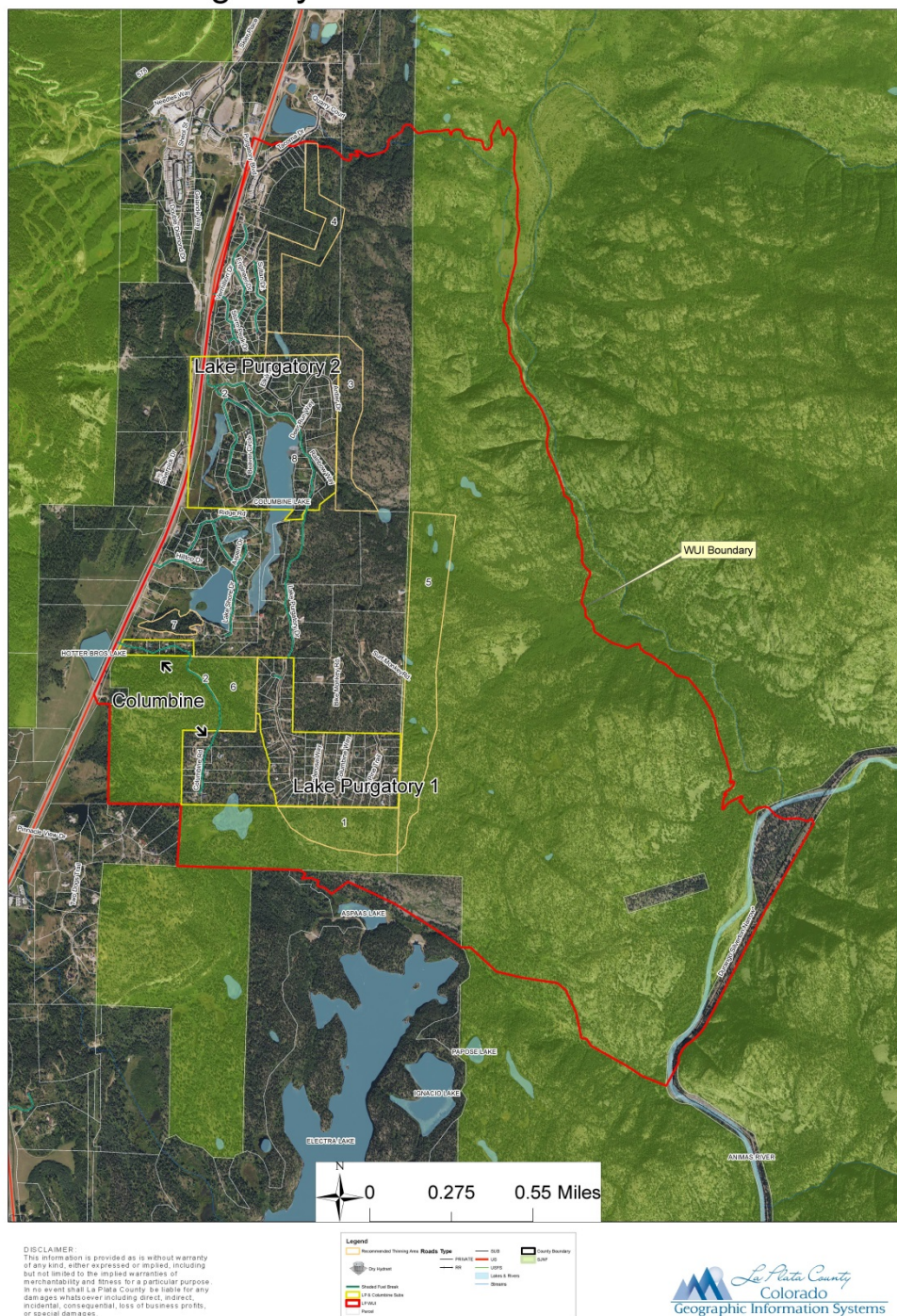
Recommendation	Priority Level	Timeline
Complete ROW mitigation as approved by homeowners	High	Ongoing
Continue beetle kill treatments and cleanup program	High	Ongoing
Develop additional shuttle GPM capacity for improved firefighting capabilities	Medium	June 2020 – June 2021
Develop alternative emergency exits	High	June 2020 – June 2025
Establish requirements to significantly improve community	High	By June 2021

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signage, fire resistant construction, defensible space, and reduce fuel sources for new construction		
Perform ROW mitigation for non-LPPO areas	High	By June 2021
Establish requirements to significantly improve community signage, fire resistant construction, defensible space, and reduce fuel sources for existing construction	Medium	By June 2022
Create fuel breaks along all community boundaries	High	By June 2024

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Lake Purgatory WUI Recommended Treatments



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C. Roads and Evacuation Priorities

Access to the subdivisions and other properties is by means of asphalt paved roads in the (DMR) North LPWUI, and many properties there have two routes of paved access. Access to the Lake Purgatory Unit I and II subdivisions and south is by means of gravel two lane roads. All properties in the Lake Purgatory, Lake of the Pines, and Columbine subdivisions and subsidiary areas currently have only one road access.

Emergency service access and egress and residential egress are priorities. Three possibilities for an emergency exit for Lake Purgatory Units I, II, III, Columbine, and Lake of the Pines are being considered:

Option (A): a route would run from Lot 3 or 4 in Lake Purgatory Unit One (currently owned by the property owners' association) through the National Forest to Columbine Road.

Option (B): is at the narrow isthmus between the "Melton Property" at 1092 Lake Purgatory Drive and the "White Property" at 410 Lake Shore Drive in Lake of the Pines, the "Helm Colorado Joint Venture Property" at 312 Columbine Road in the Columbine subdivision, or National Forest land.

Option (C): would run across the property at 1042 Lake Purgatory Drive, cross Lake Columbine (Lake Purgatory) and cross an undetermined property in the Lake of the Pines subdivision to connect with Lake Shore Drive. Initial comments from the current property owner lead us to believe he may cooperate with such a plan.

The successful completion of one of the options, along with development of an appropriate connector from Lake Shore Drive to Columbine Road through private properties not yet defined, would give a very strong alternate exit to the Columbine subdivision and Lake of the Pines, Lake Purgatory Units II and III, and some relief to Unit I. It is not a complete solution for Unit 1 since the very steep slopes to the southeast, east, and northeast are problematic.

The emergency exit would not need to be fully paved, based on resident input; it could well be a graded, properly drained, maintained gravel road, subject of course to agency requirements. This solution to a major concern is the most urgent long-term (5-10 years) issue to be addressed through this CWPP.

A gravel road, which is usable in the summer season for ordinary vehicles, exists from the north end of Ponderosa Way to Lake Purgatory Drive at the McCormack driveway, about 150 feet north of the LPPO Unit One lots 1 and 76 north lines. A dirt road, which is usable for 4-wheel drive vehicles, exists from the north end of Big Pine Trail to the same LPD location. We propose to seek authorization from Mr. McCormack to use these for emergency exits. Either or both could possibly be improved for fire vehicle access/ egress with approval from Mr. McCormack, proper funding, and a maintenance agreement.

Entry to Lake Purgatory Units 1, 2, and 3, and the McCormack property is currently solely by traveling over a reinforced concrete bridge about 200 feet from Highway 550 on Lake

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Purgatory Drive. The Lake Purgatory Drive Road Association is evaluating this bridge, which was privately constructed, for safe load. The Association anticipates posting load limits by mid-2020. A preliminary evaluation suggests the bridge will be good for axle loads of up to 30 tons.

Currently, Lake of the Pines access/egress is solely via Hilltop Drive. Likewise, Columbine access/egress is solely via Columbine Road. Maintaining these roads in good repair, with a right-of-way maintained free from excessive fuel, and with clear signage is a very high priority.

Several road intersections lack proper signage, and many homes/driveways lack adequate address numbers. We are proposing non-combustible, reflective, standardized signs properly posted.

Road grades and widths are mostly suitable for emergency vehicle use. However, large vehicle loops and turnouts are needed, along with width improvements on Columbine Road.

Some private drives are too steep, narrow, and have very tight turns. Some are closely surrounded by vegetation that threatens entrapment. Property owners are encouraged to improve access. A recommendation of this plan is to strengthen safety of access roads by reducing adjacent heavy fuel buildup.

A fire event can develop quickly, requiring fast evacuation. Preparation is critical. All residents should share a telephone tree by development, as well as an evacuation plan describing safe egress routes, address and hazard markers, and community liaisons. The plan and tree should be shared with responders.

D. Safety

The community associations within LPWUI will work with the La Plata County Emergency Manager to develop an Emergency Evacuation Plan for each subdivision. The plan will include standard evacuee assembly points, communication trees and management action points. Residents will be informed and updated on emergency protocol, communication trees, evacuation routes and gathering points.

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8. MONITORING AND EVALUATION

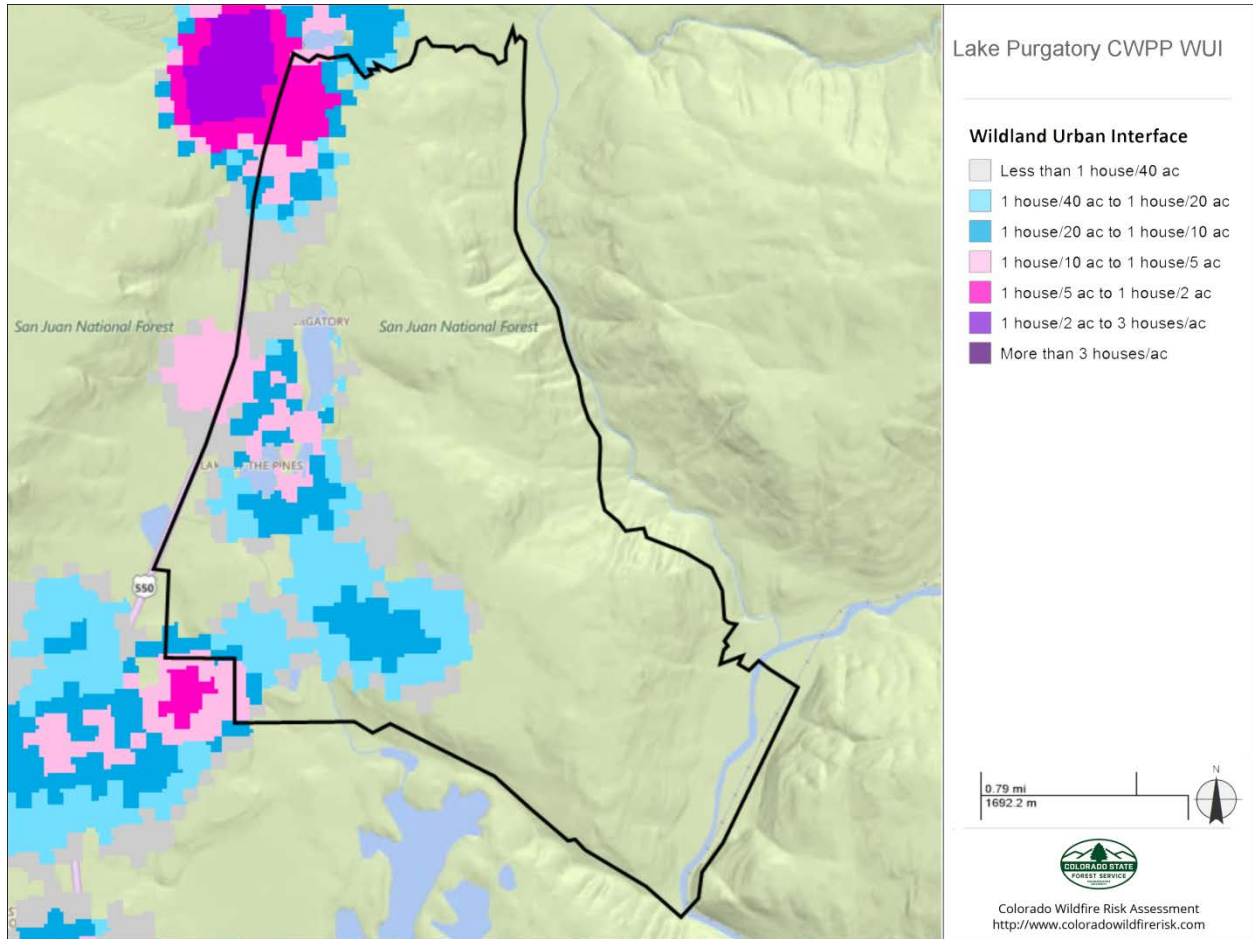
Monitoring and evaluation of all outreach, education and mitigation efforts within Lake Purgatory are an important component of the CWPP.

Action	Responsible Group	Timeline
Create annual 'lessons learned' report on CWPP activities; include benchmarks to measure progress	Community Associations	Annually
Review CWPP and monitor mitigation work status for activities covered by grants. Grants funding opportunities can be found on the CSFS website at: http://csfs.coloradostate.edu/funding-assistance/	Colorado State Forest Service	Ongoing

9. APPENDICES

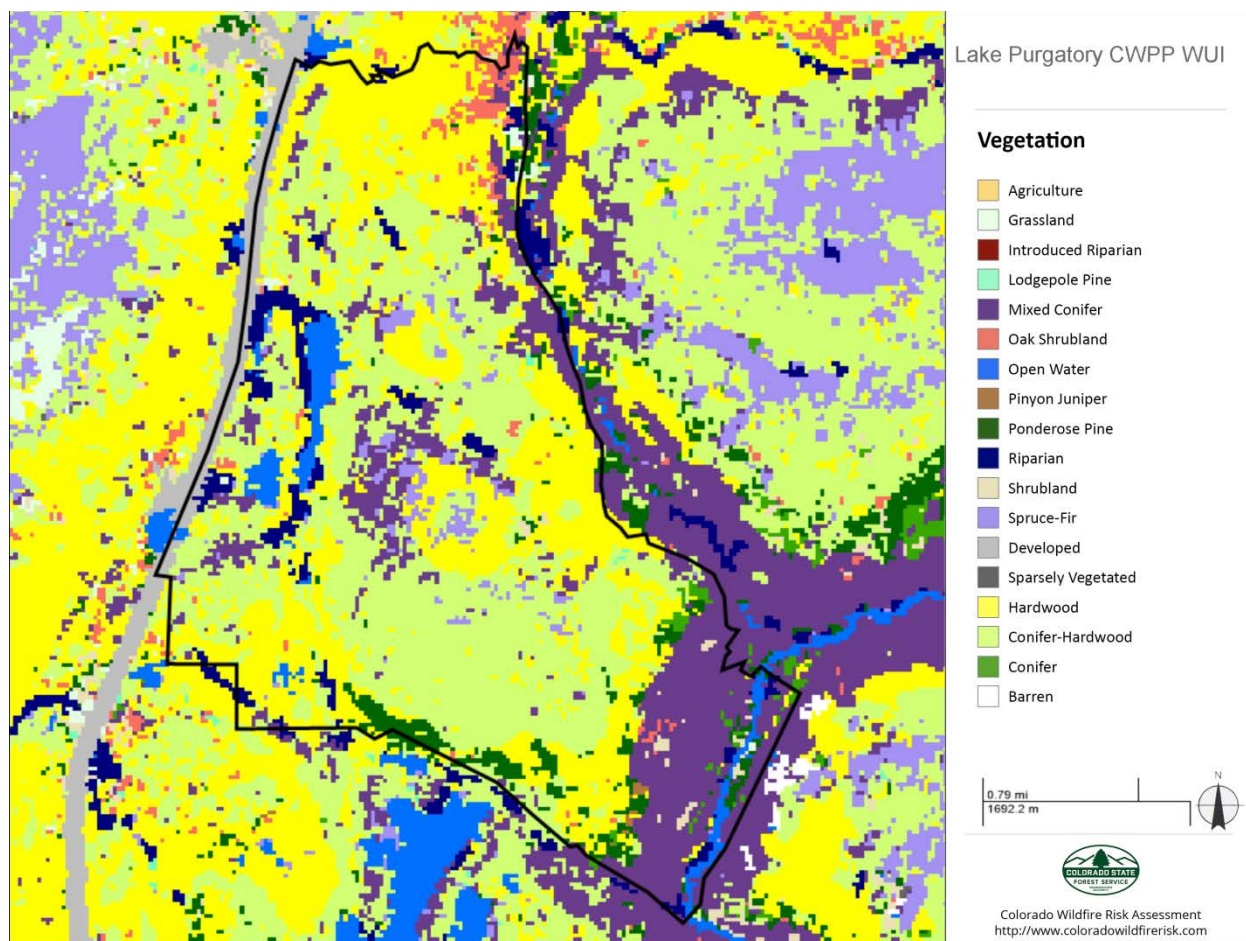
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Appendix A: LPWUI Population Map

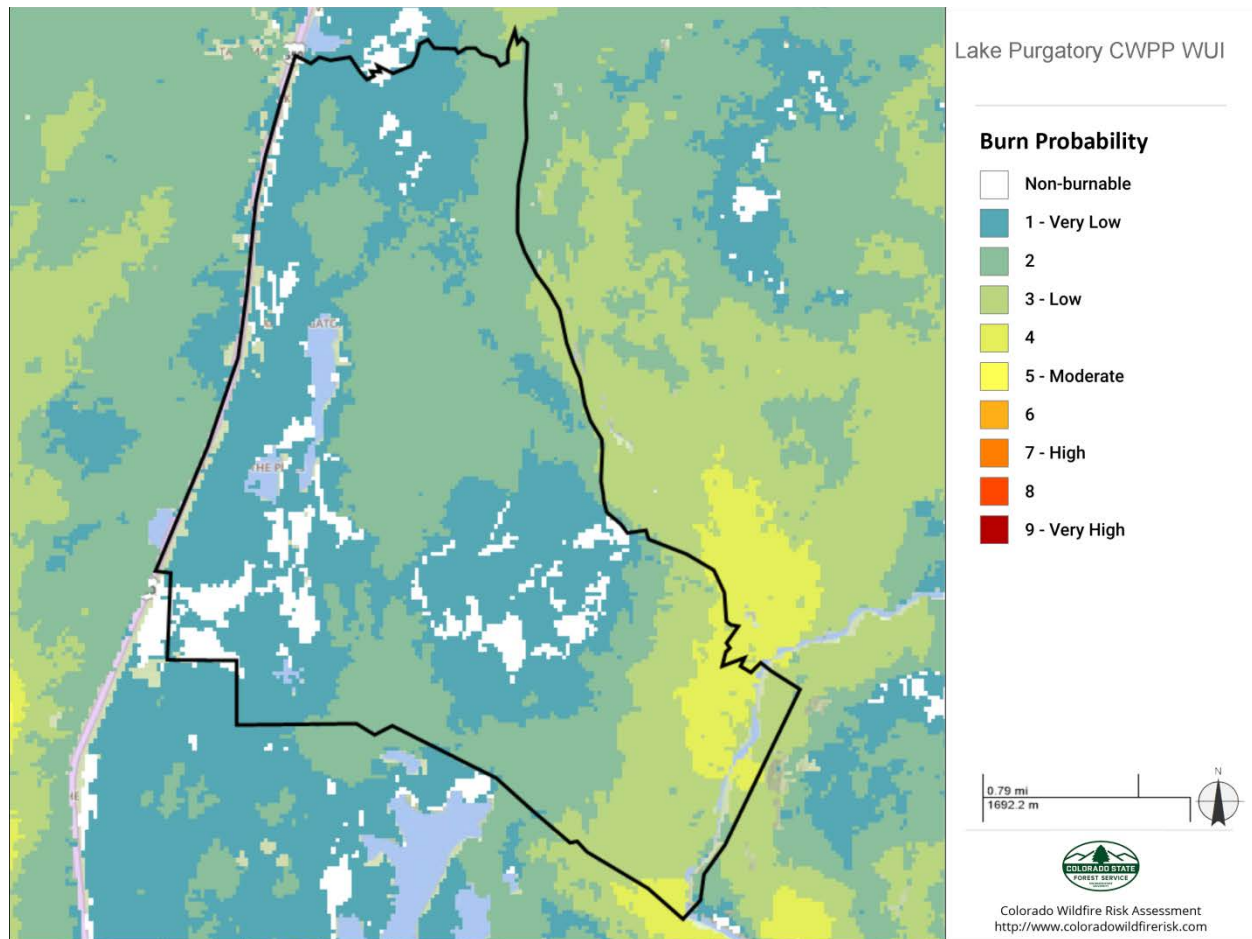


Appendix B: LPWUI Vegetation Map

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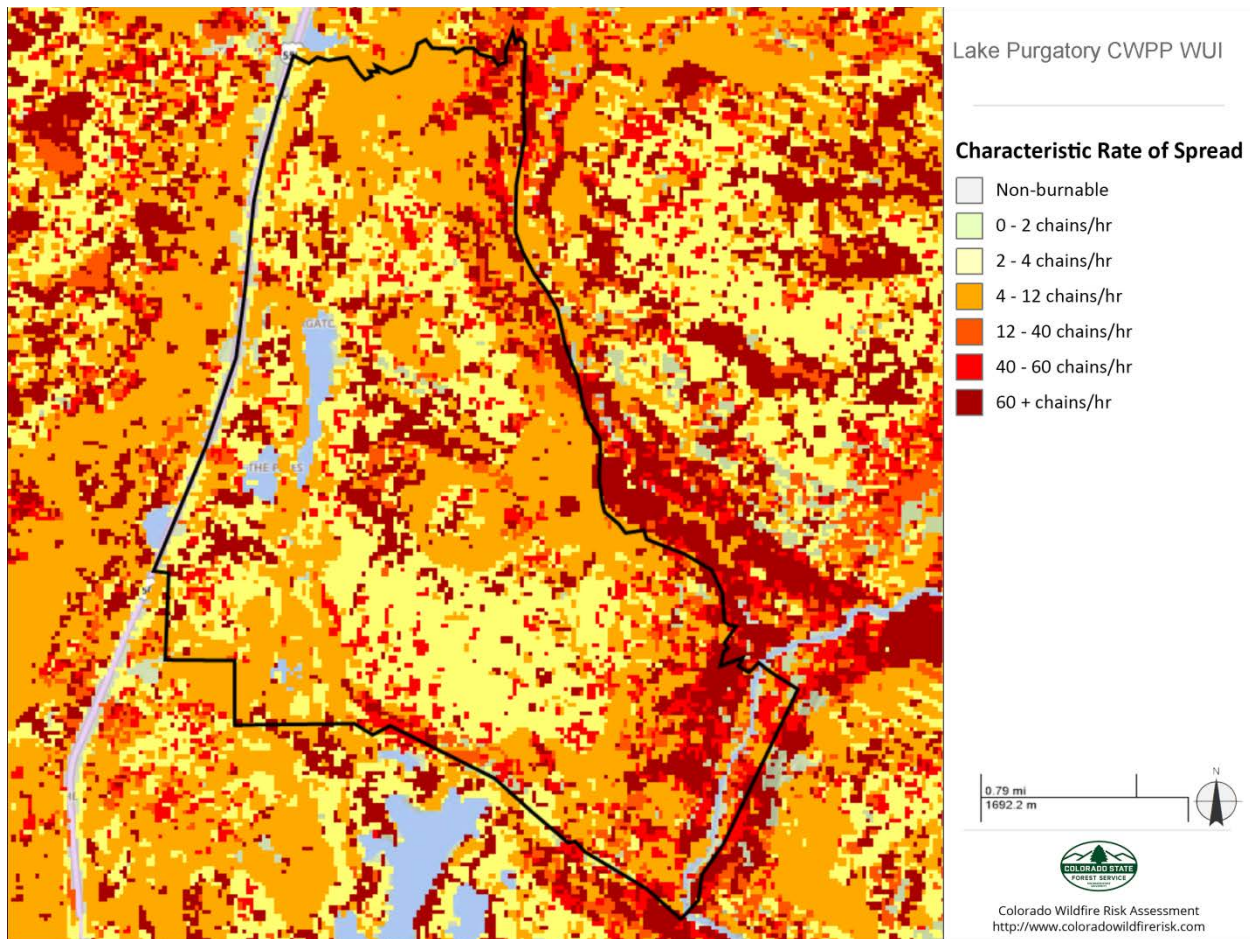


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Appendix D: Characteristic Rate of Spread

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Lake of the Pines Community Assessment

Define Community: Briefly describe the ecosystem, number and style or age of homes, roads, and land uses

Lake of the Pines is a subdivision located in the San Juan National Forest about 25 miles north of Durango and 1 mile south of the Purgatory ski resort. The subdivision is situated at an elevation of about 9,000 feet with peaks to the west rising steeply to approximately 11,000 feet. Overall, the subdivision is relatively flat, however, there is a steep hill to the east leading down to Columbine Lake. The subdivision also has Lake of the Pines encompassed within its borders. To the North lies a neighborhood named Lake Purgatory.

Lake of the Pines is located in a mixed-conifer forest consisting of Douglas fir, white fir, blue spruce and aspen trees with a few scattered ponderosa pines. Vegetation cover varies within the subdivision from dense mixed conifer to one large meadow with few trees. There is generally snow on the ground from mid-November through April. The typical annual precipitation is around 14 inches. Typically, the area also receives heavy spring rain and snowfall and summer monsoon rains.

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reliability and fitness for a particular purpose. In no event shall La Plata County be liable for any damages whatsoever including direct, indirect, incidental, consequential, loss of business profits or special damages.

This subdivision was developed in the late 1970s and early 1980s and consists of 38 - 1 to 2 acre lots, and 28 single-family homes as of 2017. Fewer than 10 residences are occupied year round. Age and building materials used on the homes varies drastically. The majority of homes are spaced more than 100ft apart from each other. Homes are generally clumped along roads with large tracts of undeveloped

Lake Purgatory Community Wildfire Protection Plan

lands further away from the roads. Most driveways are short, approximately 50ft in length and all homes are visible from the main roads.

There is one main entrance to the subdivision off of Highway 550 onto Hilltop Drive. Once you exit the subdivision to highway 550, you can either head south to Durango or north to Silverton. There is no other road out of the area. Within the subdivision, Hilltop Drive splits into several dead-end spur roads. The roads throughout the subdivision are well maintained but are all gravel. The roads are only wide enough for one vehicle, which would make it difficult for residents to evacuate while fire apparatus is entering the neighborhood. There are a number of locations that are too steep for fire engines and few roads have adequate space for a fire engine to turn around or pull outs to allow vehicles to pass one another.

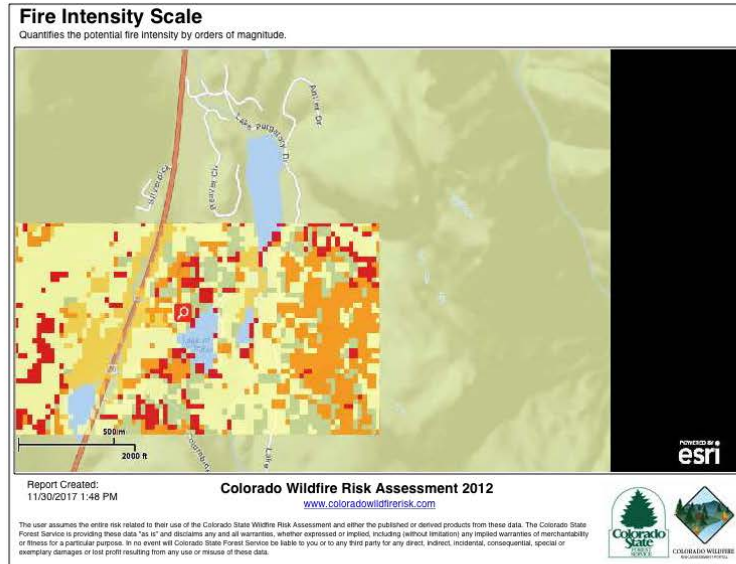


While there is a HOA in Lake of the Pines, there is no formal binding authority for the HOA to force action. The HOA is voluntary and does not have the authority to create binding covenants or rules.

Wildfire Risk: Describe how a wildfire is likely to start and spread within the community.

There are a number of potential ignition sources both within and near the subdivision both from natural and human caused sources. Within the subdivision, a fire is most likely to ignite from inadequate spark arrestors or cleaning of chimneys. Many homes have wood burning fireplaces with chimneys that are visibly dirty from the road and lacking spark arresters. This could result in an ignition within the chimney, which could spread, to the house and vegetation nearby.

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There is also potential for embers escaping homes to ignite vegetation close to chimneys. There has been little preparation done to clear vegetation from around chimneys and a fire would spread quickly under certain conditions because of the vegetation density. During cold dry winters, there is potential for an active crown fire started by embers originating from a wood burning stove or fireplace.

With highway 550 marking the west boundary of the subdivision, there is potential for human caused ignitions along the road, which could spread quickly to the community. Directly along the road is primarily grass which means any ignition could quickly increase in size and intensity as it moves into the mixed conifer forest closer to homes. The Durango Silverton Narrow Gauge Railroad is located approximately 2.5 miles east of Lake of the Pines. If there was an ignition from the train, there is potential for the fire to run uphill to Lake of the Pines in a very short period of time. There is no access for vehicles between Lake of the Pines and the train presenting difficult conditions for firefighters to stop the fire outside the subdivision.

Lightning strikes and ignitions are common in the area. While these ignitions most often are contained, under extreme fire conditions a lightning strike could spread quickly and devastate the community. A large-scale fire could also move into the neighborhood since there are no fuel breaks around the edge of the community.

Wildfire Preparedness Activities: Describe past and current wildfire preparedness activities in the neighborhood.

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Lake of the Pines joined FireWise of Southwest Colorado in the spring of 2017 with Gordon Maller acting as the FireWise Ambassador. While a few individual property owners have worked to clear vegetation around their homes, the majority of the subdivision has not been mitigated and this community assessment will act as a starting document to encourage community action towards preparing for wildfire.

Community Strengths and Vulnerabilities: Provide photos and brief descriptions of common strengths and vulnerabilities of the community in the following categories. Try to capture photos of hazards without giving away the home or take pictures of hazards as well as wildfire preparedness efforts at the same home site.

Lake of the Pines benefits from the altitude, vegetation type, and annual precipitation. With snow on the ground for an average of 6 months out of the year, fire danger is significantly reduced, however, not eliminated. At 9,000 feet, temperatures are cooler on average than lower elevations and fuels the fuel types present tend to hold more moisture than closer to Durango. When there is a fire, it is likely it will be a stand replacing crown fire instead of a low intensity ground fire. While the fuel type is not as volatile as lower elevations, vegetation is overly densely and ladder fuels are present throughout the subdivision.



Lower branches and dead wood on the ground can easily carry fire from a roadside ignition into the canopy where it could run from tree crown to tree crown.

Few homes have adequate defensible space. The homes that have done preparation work throughout Zone 1 still need further preparation in Zone 2. Throughout the subdivision, there are numerous dead standing and dead and down trees which pose risk if fire is in the area. Standing trees, especially along roads, have potential to cut off egress routes and trap residents.

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Left: Homes often have wooden decks or balconies and vegetation is dense throughout. Right: Many driveways are narrow and overgrown. While you can see most homes from the road, that is not always the case.

On a community scale, fuel breaks and safe zones could be created if individual property owners are willing to work together. Since there is no communal property around the subdivision, it is the responsibility of individuals to mitigate themselves. Furthermore, the HOA does not have the authority to create or enforce covenants requiring mitigation work.

The closest fire station is Durango Fire Station 16 located at the base of Purgatory Ski Area approximately 2 miles away. There is also Durango Fire Station 15, commonly known as the Electra Lake station, approximately 4 miles to the south. Station 15 is staffed full time. Within the community there are no fire hydrants. While it would be possible to pull water directly from Lake of the Pines, currently, there are no locations suitable for pulling water from the lake.

Evacuation Readiness: Describe the community and individual household evacuation readiness or needs.

The only improved ingress and egress into Lake of the Pines consists of the unpaved entrance off of Hwy 550. A second possible route through lots in Lake of the Pines

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and Beaver Circle subdivisions may be developed in the future. This route would connect to Lake Purgatory Rd in the Lake Purgatory subdivision.



As a community, evacuation planning has not been addressed and the community would benefit from an evacuation drill. All residents should be encouraged to sign up for the La Plata County Code Red system and prepare a “go bag” to reduce the chances of delaying evacuation in an emergency situation.

Plan of Action:

Based on the vulnerabilities and beliefs about fire risk and spread in your community, create a list of achievable actions to reduce the risk and make community members more prepared for wildfire.

Keep in mind the five areas of consideration for a Fire Adapted Community: Evacuation Readiness, Access, Built Environment, Defensible Space, and Community Protection.

Designate at least one Firewise day education or mitigation project (Firewise Communities requirement).

Include at least \$2/per capita/per year of work to be completed (Firewise Communities requirement).

This list may be developed with input of the community during or directly following the assessment, or may be brought to the community in a follow-up gathering where the findings of this plan are presented.

Lake Purgatory Community Wildfire Protection Plan

Resident Recommendations

1. Encourage Residents to sign up for La Plata County Code Red system to receive emergency notifications. This can be done online here: <http://public.coderedweb.com/cne/en-US/BFEA18547A8D>
2. Purchase blue reflective address signs from the county building department to standardize markings for home.
3. Create defensible space to Colorado State Forest Service Standards which can be found here: https://static.colostate.edu/client-files/csfs/pdfs/FIRE2012_1_DspaceQuickGuide.pdf

Community Recommendations

4. Create information packets to pass out to residents and new homeowners to educate them about wildfire danger and mitigation practices.
5. Remove dead standing trees.
6. Remove hazard trees, which could fall across roads cutting off egress routes.
7. Remove dead and down fuel from throughout subdivision and move firewood away from trees so it will not carry surface fire vertically into the crowns of trees.
8. Add "Dead End" signs to existing roads.
9. Widen dead end turnarounds to 150ft in diameter with less than 5% grade to allow fire trucks to turn around safely.
10. Open up a dialogue with Lake Purgatory and private property owners to discuss potential for secondary egress route for both neighborhoods.
11. Create a community emergency contact list.

Using and Reviewing this Assessment:

This Assessment is a tool for sharing general information about the wildfire hazards in your community. The plan of action is for short-term goals to be pursued with the lead of the community's FireWise Neighborhood Ambassador(s). This plan should be reviewed each year to reflect the actions taken by the community and outline a further plan of action. As needed, the fire district and forestry professionals should be invited back to review the work that has been done, and its potential efficacy for addressing the risk it is proposed to reduce.

This Assessment can be used for the purposes of seeking Firewise Communities USA status from the national Firewise organization. See www.firewise.org for more information and to obtain an application.

This Assessment is not a substitute for individual homeowner action. It is critical for residents to become informed of their specific risks and vulnerabilities to life and property. Neighborhood Ambassadors are available to provide technical support and encouragement for individual property actions, but will be focusing on their own properties and activities that can reduce the wildfire risks to the community as a whole. Even if you have addressed all of the vulnerabilities identified in this plan,

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there is no guarantee that there won't be significant losses from a wildfire in your community; however, every step taken as individuals and as a community reduces the risks posed by wildfire in your community.