



Lyons Fire Protection District Community Wildfire Protection Plan (CWPP)

August 3, 2011

**Lyons Fire Protection District
Community Wildfire Protection Plan
(CWPP)
Signature Page**



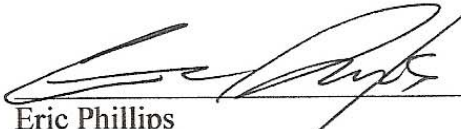
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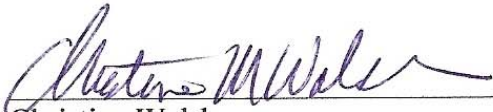
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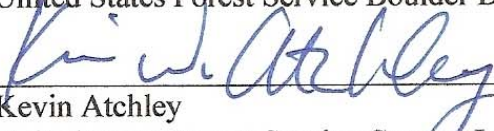
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INTRODUCTION

Purpose

A Community Wildfire Protection Plan (CWPP) is a collaboratively developed strategic plan that identifies specific wildfire hazards and risks facing Wildland Urban Interface (WUI) communities and neighborhoods. The CWPP development process allows the community to plan how it will reduce these wildfire hazards and risks. It provides prioritized mitigation recommendations that are designed to reduce those hazards and risks by identifying the most critical areas and effective methods for fuel reduction within the area of study.

The Lyons Fire Protection District (LFPD) was one of the last communities along the Colorado Front Range to develop a CWPP. Recent local fire activity such as the Four Mile Canyon Fire in September 2010 in the foothills west of Boulder is a stark reminder of the urgent need to develop a plan in preparation for a catastrophic fire that could strike at any time. The first step in wildfire prevention is to raise awareness of the responsibilities of living in a fire-prone environment. Individual and community action can ensure that homes and neighborhoods are better prepared for wildfire when it strikes.

This approved CWPP makes the district eligible for increased priority for mitigation projects through a variety of avenues. A certified CWPP creates a National Fire Plan funding priority to support the financing of projects identified in the assessment. Further, federal land management agencies (such as the U.S. Forest Service) may be able to expedite the implementation of fuel treatment projects identified in the CWPP. An approved CWPP is also a prerequisite for many mitigation grant opportunities for homeowners and communities. Also, we may be able to influence the priority and timing of potential Boulder County actions to treat identified areas in the County-owned open space in and adjacent to the district.

Goals and Objectives

1. Develop a CWPP for the LFPD that meets or exceeds the minimum state standards in order to qualify the community for wildfire mitigation grants.
2. Improve wildfire protection through community awareness and education.
3. Involve district firefighters in conducting community surveys to increase community interaction, and provide firefighters training and familiarity with roads, housing areas, and wildfire risks.
4. Prioritize hazardous fuel reduction projects for the district as well as USFS and Boulder County.
5. Improve fire department response by collecting information to support incident planning and future detailed pre-plan efforts.
6. Provide landowners information on practical and effective ways to reduce wildfire risk to their property.

7. Disseminate information to the community on actions to take in the event of an imminent wildfire incident.

Area of Study

The LFPD encompasses 66 square miles of principally dispersed residential housing with a population of approximately 6200. This includes 40 square miles in northern Boulder County and 26 square miles in southern Larimer County. Centrally located within the district is the historic town of Lyons, with a population of approximately 2000 and limited light commercial activity. The district includes several surrounding neighborhoods in unincorporated Boulder and Larimer counties, such as Lyons Park Estates, Apple Valley, Apple Ridge, Longmont Dam Road, Spring Gulch, Blue Mountain, X-Bar 7, Steamboat Valley, Eagle Ridge, Stone Canyon, Dakota Ridge, and several miles up the north and south St Vrain creeks. The total number of residences is approximately 1400. See Map 1, Appendix A, page A-1.

The entire LFPD is located in the Wildland Urban Interface (WUI) - defined as the area where structures and other human development meet or intermingle with undeveloped wildland. The topography is characterized by rugged foothill and mountainous terrain with numerous limited access dirt roads and minimal water resources for fire suppression. The majority of the district is in the Montane Zone of the eastern slope of the Northern Colorado Front Range, with elevation ranging from 5030 in the east to 9280 feet toward the west. The predominant vegetation is ponderosa forest and native grasses, with some Douglas fir on north facing slopes at the higher elevations. The district spans two major highways, Colorado State Routes 36 and 7, which are the primary access for residents living further up in the mountains, and the communities of Riverside, Allenspark, Pinewood Springs, and Estes Park. The district includes 19 square miles of US Forest Service lands and 16 square miles of Boulder County open space, and is bordered on the north, south and west by sparsely developed ponderosa forests and to the east by grass and agricultural lands.

This CWPP was conducted in coordination with the Hygiene Fire Protection District. Hygiene includes only two areas of foothills communities that are in the wildland urban interface, Rabbit Mountain and North Foothills. These communities are included in the study area.

The Hygiene FPD covers 50 square miles serving rural Boulder County west of Longmont, east of Highway 36, north of Nelson Road, and south of Yellowstone Road. Aside from the foothills areas included in this study, flat agricultural lands and rural residential areas characterize the remainder of the Hygiene FPD. The Rabbit Mountain Boulder County Open Space and several smaller parcels owned by Boulder County are included in the district.

The climate in the study area is semi-arid, with annual rainfall less of than 12 inches, and has been in a mild drought condition for the past 7 years. Several times per year, the area is swept by dry westerly Chinook winds with gusts frequently over 75 miles per hour.

Background and Governing Directives

Recent catastrophic wildfires in the United States have highlighted the increasing threat of wildfires to urban and rural communities. For more than a decade, Congress has made the protection of communities from wildfire a national priority. The development of the National Fire

Plan in 2000 and passage of the Healthy Forests Restoration Act (HFRA) in 2003 addressed the issues regarding the deteriorating health of our forests and the need for greater community protection from wildfire. The HFRA provides communities with a tremendous opportunity to influence where and how federal agencies implement fuel reduction projects on federal lands. A Community Wildfire Protection Plan (CWPP) is the most effective way to take advantage of this opportunity. Additionally, regions with Community Wildfire Protection Plans in place are given priority for funding of hazardous fuels reduction projects carried out under the HFRA.

The Boulder County foothills and mountain areas are listed in the Federal Register as Urban-Wildland Interface Communities in the Vicinity of Federal Lands That Are at High Risk from Wildfire (<http://www.forestsandrangelands.gov/resources/documents/423-437-en.pdf>).

The area is also shown in the Colorado State Forest Service WUI Hazard Assessment map as red, an area of high Hazard Value (an aggregate of Hazard, Risk and Value).

The Larimer County Fire Plan wildfire hazard map shows about 35% of the Larimer County portion of the district in the very high hazard range, 10% in the high hazard range, and the remainder as moderate hazard. The entire portion of the LFPD in Larimer County is in the WUI zone. Also, the entire area appears in the High Planning Area Priorities areas of Estes Valley, Thompson River, and Carter Lake.

It is generally acknowledged that decades of a policy of fire suppression along the Front Range has exacerbated the potential for high-intensity wildfire due to resulting overgrown and unhealthy forests.

In 2009, the Colorado Legislature passed SENATE BILL 09-001 “to facilitate and encourage the development of CWPPs in counties with fire hazard areas in their territorial boundaries and to provide more statewide uniformity and consistency with respect to the content of CWPPs in counties needing protection against wildfires.”

Subsequently, in November 2009, the Colorado State Forest Service (CSFS) provided the minimum standards for developing CWPPs. This plan was developed in accordance with those standards, utilizing the handbook, leaders guide and community guide provided by the CSFS.

Core Team

The following personnel attended one or more Core Team meetings as the designated representatives of the primary stakeholder organizations:

Colorado State Forest Service District Forester Allen Owen
Lyons FPD Chief J.J. Hoffman, Asst Chief Paul Davidovich
Boulder County: Chad Julian, Eric Phillips, Jim Webster
Larimer County: Tony Simons, Kevin Johnston
US Forest Service: Dave Niemi, Richard Edwards, Will Braggs
Hygiene FPD Chief Bill Nelson, Chief Bill Eliassen
Lyons FPD Mapping and Analysis: Maureen Davidovich

Stakeholders

The following stakeholders were identified. These are organizations that would be impacted by a wildfire in the district, as well as those with a defined or perceived interest in implementing the CWPP recommendations.

- US Forest Service: Boulder District and Canyon Lakes District
- Colorado State Forest Service: Boulder District and Fort Collins District
- Boulder County:
 - Emergency Services
 - Parks & Open Space
- Larimer County Emergency Services
- Town of Lyons
- City of Longmont Water (Buttonrock Preserve)
- CDOT
- Community Reps (HOAs, Road Associations)
- Utilities:
 - Excel Energy
 - Poudre Valley Electric
 - Longmont Electric
 - Lyons Electric
 - Qwest
- Adjacent Fire Protection Districts:
 - Left Hand FPD
 - Pinewood Springs FPD
 - Hygiene FPD
 - Allenspark FPD
 - Berthoud FPD
 - Larimer FPD

Local Fire History

Local fire history has only been recorded since settlement in the 1850s.

Old tree rings evidence fire scars from two particularly dry years in 1858-1859 and 1859-1860 during which wildfires raged in Boulder County. While there may have been many small fires or just a few large ones during those years, it is clear that the forests in Boulder County sustained large amounts of damage. Studies of the incidence of wildfire in local Ponderosa Pine forests show wide variation, with intervals from 1 to 96 years, and average intervals of 17 to 40 years.

As fire suppression efforts during the past 100 years in the foothills have contributed to dense, overgrown forests, there are significant parts of the LFPD that are long overdue for a fire. In addition to fire suppression efforts by the USFS and local agencies, local quarry activity and ranching may also have disrupted the local incidence of wildfire. The quarries brought several hundred men to the area that built houses, hotels, schoolhouses, boarding houses and saloons using the local timber and sandstone. They scraped large areas of the landscape for sandstone, leaving tailings, and temporarily limited the wildfire threat by eliminating much of the forest, clearing it or using it for firewood. Historic photos show large areas that are currently forested

that were devoid of trees in the 1880s. As a result of regeneration, some areas of the current forest are characterized by dense growth of similar aged trees.

As the mountains near Boulder have been developed since about 1960, there has been increasing pressure for effective fire suppression. Increased property values and growing populations have led to the establishment of fire protection districts taking responsibility for the populated and accessible portions of Boulder County.

According to the USFS, there have been 55 wildfires on Forest Service Land in the district since 1962, 34 class A (size less than ¼ acre), 16 class B (¼ - 10 acres), and 5 class C (10-100 acres).

The Class C fires were:

- These Roads, 1988, 23 acres
- Hells Canyon, 1994, 94 acres
- Cook Mountain, 1985, 52 acres
- Little Narrow, 1995, 32 acres
- 27 Mile, 1984, 32 acres

Lyons FPD has recorded 48 Class A wildfires, 49 Class B, 10 Class C, 1 Class D, and 1 Class E since 1998.

Hygiene FPD has recorded 15 Class A wildfires, 24 class B, 7 Class C, 1 Class D, and 58 of unrecorded size since 2004.

Additionally, the following larger fires have been recorded in the foothills surrounding the district: Class E (300-1,000 acres); Class F (1,000 -5,000 acres); Class G (5,000 acres or more).

Fire	Date	Class	Acres	Deaths	Structures*	Cause
Four Mile Canyon	Sept 2010	G	6200	0	169	Human
Reservoir	Sept 2010	E	750	0	6	Human
Old Stage II	Jan 2009	F	3000	0	2	Power Line
Overland	Oct 2003	F	4000	0	31	Power Line
Big Elk	Jul 2002	F	4350	3	1	Human
Walker Ranch (Eldorado)	Sep 2000	F	1100	0	0	Human
Bobcat Gulch	Jun 2000	G	10,700	0	22	Human
Old Stage Fire	Nov 1990	F	3000	0	15	Human
Black Tiger	Jul 1989	F	2100	0	44	Human
Lefthand Canyon	Sep 1988	F	2300	0	0	Human

*Four Mile Canyon Fire destroyed 169 homes. Available data does not distinguish if structures destroyed in other fires are homes or other types of buildings.

Values at Risk

Values at Risk are the human and intrinsic values identified as important to the way of life of the study area. In any hazard and risk assessment, human life and welfare are the most important resources to protect. The WUI has inherent risks including development in areas historically prone to fire, hazardous fuels, and limited access. Both the immediate and long-term consequences of a wildland fire must be considered.

Life and safety: Area residents and firefighters.

Protection of Property: Homes, businesses and other structures.

Critical Community Infrastructure: Power, data, municipal water supply pumping station, water treatment plant, Longmont Power hydroelectric generating plant, electric towers, lines and substations, and various communication repeaters.

Local economy: Town of Lyons and area businesses, quarries.

Schools: Lyons Elementary School, Lyons Middle/High School.

Historic structures: 16 buildings in town of Lyons, plus homesteads and other archeological stone sites.

Tourism: 2 of 4 primary routes to Rocky Mountain National Park, the Scenic Peak to Peak Highway, and Estes Park.

Watershed health and water quality: Municipal watershed for Longmont and Ralph Price Reservoirs in the Button Rock Preserve (city of Longmont and Lyons water supply), North and South St Vrain Creek and Little Thompson River drainage, aqueduct from Carter Lake, Watershed for Carter Lake.

Recreation: Town of Lyons parks, Boulder County Open Space, Button Rock Preserve, and Roosevelt National Forest provide opportunities for hiking, mountain biking, rock climbing, tubing, white water rafting, fishing, horseback riding, road bike racing and training, while the Town of Lyons is renowned for its outdoor concerts, festivals, and art shows.

Air quality: Smoke from active fires is a threat to the long-term health of residents, particularly those with respiratory ailments.

Forest health: The ability of the forest to sustain itself ecologically and provide what society wants and needs. A healthy forest maintains its unique species and processes, while maintaining its basic structure, composition and function and has the ability to accommodate current and future needs of people for values, products and services. While fire is a natural part of the lifecycle of a forest, fires that reach extreme temperatures can sterilize the soil and adversely impact natural processes such as regeneration.

Native vegetation: Hall Ranch: four natural plant communities of cottonwood riparian forest, riparian shrubland, mixed foothill shrubland, and wet meadow. Heil Valley Ranch includes a ponderosa pine/mountain mahogany/big bluestem plant community. Natural Heritage Conservation Sites include Indian Lookout Mountain, Red Hill, and the Plumely Canyon.

Landscape: scenic views of the foothills from within the district as well as from the Cities of Longmont and Loveland, and from Boulder and Larimer County Open Space.

Wildlife habitat: Hall Ranch has been heralded as a crucial wildlife habitat. It is home to the tiny ruby-crowned kinglet, golden eagle, great horned owl, Cooper's hawk, nighthawk, mountain lion, elk, bighorn sheep, white-tailed deer, black-tailed prairie dog, coyote, fox, badger and bobcat, and prairie rattlesnake. Heil Valley Ranch has remained relatively undeveloped from prehistoric times through present day, making it premier wildlife habitat. The variety of ecosystems (grasslands, shrublands, woodlands, forests and canyons) supports an abundance of wildlife, including Abert's squirrels, cottontail rabbits, prairie dogs, marmots, red and gray foxes, mule deer, bobcats, black bears and mountain lions. It is also a rich breeding bird habitat. Heil Valley Ranch is now an important winter range for elk that migrate from the Indian Peaks Wilderness Area - the only herd along the Front Range who journey from the Continental Divide to the Plains. Roosevelt National Forest provides habitat for bighorn sheep, in addition to several of same species listed above. Button Rock Preserve provides habitat for mule deer, coyotes, mountain lions roam yellow-bellied marmots, cottontail rabbits, Abert's squirrels, black bear and prairie rattlesnakes. Birds include eagles and occasional osprey, ducks, geese, great blue heron, mountain bluebirds, Steller's Jays, and hummingbirds. The reservoir is stocked with brown and rainbow trout and splake, a brook and lake trout hybrid. North and South St Vrain Creeks also contain trout (brown, rainbow, and cutthroat).

Lyons Fire Protection District Capabilities

Lyons Fire is staffed by an all-volunteer force with a full time Fire Chief. Lyons Fire responds to a range of emergency incidents including: structural fire, technical rescue, search and rescue, emergency medical services, hazardous materials, natural disaster response, and wildland fires. The District has two stations where volunteers report to staff applicable apparatus for emergency response. The primary station (Station 1) is located in the town of Lyons, and Station 2 is located near the Blue Mountain area of Larimer County. Volunteers are notified by Boulder County Communication Center of an incident over VHF pagers.

The district responds to and is aided by other nearby agencies for incidents beyond the equipment and personnel capabilities of a single district. Mutual Aid Agreements are in place, primarily for structural fires not served by fire hydrant systems, expanded wildland fire, technical rescue, and advanced life support medical services.

Apparatus: Emergency response apparatus owned by the LFPD are configured to provide capabilities to respond to a range of incidents. The following descriptions focus on the capabilities for response to a wildfire incident. In November of 2010, a Lyons Fire Protection District Bond Issue was presented to the voters of the district and passed with approval to move forward on the purchase of a new Wildland Urban Interface Engine, as well as new water tender and quick response vehicle. Also included in the recently approved bond issue was the purchase of a large generator and a large portable diesel water pump for serving areas in the district that do not have pressurized water supply from fire hydrants.

Type 1 Engines are main pumper engines designed to effectively respond to structure fires. During wildfire incidents, these engines are primarily assigned to the role of structure triage, preparation, and defense. These engines are the only apparatus that have the equipment and personnel to effectively engage a structure compromised by fire. The apparatus have the capability to pump large quantities (500-1250 gallons/minute) of water and water/foam mixtures to extinguish intense concentrated fires. To support an effective flow rate of Type 1 Engines, an adequate water supply is required. Water is supplied by connection to a municipal fire hydrant system, or by shuttling water to the engine using water tenders. Lyons Fire has four Type 1 Engines that are pictured in figure 1 with the capabilities listed in Table 1. Two of the engines are nearly 30 years old, and do not have the personnel capacity to allow safe entry into burning structures. The fire district is working to replace two aging engines with a new Type 1 Engine with wildland/urban interface capabilities.

Type 3, 4, 5, & 6 Wildland Engines are specifically designed and equipped to respond to wildfire incidents. The Wildland engines are configured with equipment to allow various response capabilities and tactics. The types of actions that can be taken include pump and roll direct attack, hose lays, fire line construction using hand tools and chainsaws, and burnout operations with ignition devices. The wildland engines may be assigned roles of structural triage, preparation and defense, as well as direct or indirect fire line construction. Direct fire line operations can only be accomplished in lower intensity fires where flame lengths are less than four feet for dismounted personnel or eight feet for engine use (provided an adequate water supply is available). Lyons Fire has one Type 4 Engine (4030), one Type 5 Engine (4031), and one Type 6 Engine (4032) pictured in figure 1. Primary capabilities are listed in Table 1. The new quick response vehicle will be designed to be rapidly reconfigured for wildfire response.

Water tenders are used to supply water to engines engaged in firefighting roles. The tenders are equipped with portable ponds that may be set up and filled for use by the engines. Tenders continue to shuttle water, refilling from a pressurized source (such as a hydrant), or suctioning water from cisterns, ponds, or any other adequate static water source. The LFPD has 2 water tenders depicted in figure 1. Their capabilities are listed in Table 1. One of the tenders is nearly 30 years old with a limited water tank capability. The fire district will replace the aging Tender with the purchase of a larger capacity tender using the funds approved by the Bond Issue. The new tender will be equipped to provide limited direct attack capabilities during wildfire response.

Other apparatus may be assigned roles during a wildfire incident. Rescue apparatus will be assigned medical support roles for resources assigned to the fire. Command and utility vehicles provide mobile command center to direct operations, logistic support and transporting supplies and personnel.

Table 1: Wildland Capability of LFPD Apparatus

Apparatus	Type	# Personnel	Water Capacity (gal)	Pump Capability (gpm)	Other
4010	1	2-3	500		4x4
4011	1	2-3	1000		
4012	1	3-6	750	1250	Class A&B Foam
4015	1	3-6	1000	1250	Class A&B Foam
4030	4	2-3	900		4x4 Class A Foam Pump & Roll
4031	5	2-5	435		4x4 Class A Foam
4032	6	2-5	400		4x4 Class A Foam
4040	Tender	1-2	1600		Portable Pond
4041	Tender	1-2	2500		Portable Pond
4020	Medical	2-3	-	-	Basic Life Support 4x4
4027	Medical	2-3	-	-	Basic Life Support 4x4
4050	Command	1-2	-	-	4x4
4051	Utility	1-4	-	-	4x4
UTV	Utility	1-3	-	-	4x4
ATV	Utility	1-2	-	-	4x4

Personnel: Lyons Fire has an authorized staffing level of one full time paid chief and 43 volunteer firefighters: 9 officers, 24 regular members and 10 reserve members. Officers and regular members are volunteers living in the district, within 5 miles of a Lyons Fire Station, or work at least 30 hours per week in the district. Reserve members live within 15 miles of a Lyons Fire Station. Volunteers are a dedicated mix of civic minded, motivated men and women, most of whom have families and other full time employment. September 2010 regular membership was approximately 60% of staffing. Members are annually required to attend 48 hours of scheduled training, many additional hours of duty crew conducting training or equipment upkeep, and respond to a percentage of emergency response calls. The greatest challenge for the district is the recruitment, retention and training of qualified volunteers, particularly to staff apparatus at Station 2.

Training: The district provides funding for training of personnel for qualifications that directly support emergency response roles of Lyons Fire. In order to provide adequate, all hazard response to residents of the LFPD, the training goal is to have all members qualified to Emergency Medical First Responder, Structural Firefighter 1/Hazardous Materials Operation and Basic Wildland Firefighter. Additional qualifications (technical rescue, vehicle extrication, emergency medical technicians, etc.) are provided based on district needs and member experience and desires. Training requirements for wildland firefighting are defined by the National Wildfire Coordinating Group (NWCG). NWCG qualifications are obtained by a combination of required courses and experience/demonstrated performance. The focuses of wildland qualifications are for operational positions up to and including squad boss, crew/engine boss and strike team/task force leaders.

Emergency Response: Response begins with receipt of an emergency page and varies with the availability of personnel, time of day and environmental conditions. Most of the volunteers live in the unincorporated portions of the district and have travel times to a fire station of 5-8 minutes. Many of the volunteers are employed outside the district during the workday. Once adequate personnel have arrived, the first apparatus will respond to the incident; other apparatus will respond as additional personnel become available. Access on steep mountainous roads, many unpaved, results in typical enroute times in excess of 20 minutes in the unincorporated areas of the district, and may be 30 minutes or longer to the furthest extents of the district.

Water Supply: The Town of Lyons provides a pressurized hydrant system within the town limits and several hydrants along Apple Valley Road and Ute Highway. The remainder of the district relies on other non-municipal sources of water. Non-municipal water supplies are static (non-pressurized) sources that require apparatus to draft (suction) water into a pump. Most fire apparatus have the capability of drafting to a maximum lift of 20-25 vertical feet and carry 10 to 25 feet of suction line, restricting potential sources of water that can be used for fire response to those readily accessible from a roadway or safe parking area. The North and South St Vrain Creeks and river have seasonal water supply possibilities at a few access points. Several ponds are also available as seasonal water sources, again with access issues. Current building codes require new rural homes to provide dedicated fire cisterns (1600-2400 gallon), however most homes in the district were built before such cisterns were required. Many homes use small (500-1000 gallon) cisterns for drinking water storage, and these may be used for firefighting in extreme circumstances, if accessible. The lack of adequate water supply throughout much of the district is a critical issue that needs to be improved through a combination of municipal hydrant system extension and installation of large (15,000 gallon) community cisterns. The District has mutual aid agreements with surrounding agencies to provide water tender support in the event of a fire incident.

Hygiene Fire Protection District Capabilities

Hygiene Fire is staffed by an all-volunteer force. Hygiene Fire responds to a range of emergency incidents including: structural fire, technical rescue, search and rescue, emergency medical services, hazardous materials, natural disaster response, and wildland fires. The District has one station, located at the corner of 75th Avenue and Hygiene Road in Hygiene, where volunteers report to staff applicable apparatus for emergency response. Volunteers are notified by Boulder County Communication Center of an incident over VHF pagers.

The district responds to and is aided by other nearby agencies for incidents beyond the equipment and capabilities of a single district. Mutual Aid Agreements are in place, primarily for structural fires not served by fire hydrant systems, expanded wildland fire, technical rescue, and advanced life support medical services.

Apparatus: Hygiene fire equipment includes 3 engines, 2 Brush Trucks, 2 Tankers, Ladder Truck and a Medical Unit. They also have a rescue boat for water related incidents.

Personnel: Hygiene FPD has an authorized staffing level of 35 volunteers.

Training: The district provides funding for training of personnel for qualifications that directly support emergency response roles of Hygiene Fire Department. In order to provide adequate, all hazard response to residents of the HYFD, the training goal is to have all members qualified to Emergency Medical First Responder, Structural Firefighter 1/Hazardous Materials Operation and Basic Wildland Firefighter. Additional qualifications (technical rescue, vehicle extrication, emergency medical technicians, etc.) are provided based on district needs and member experience and desires. Training requirements for wildland firefighting are defined by the National Wildfire Coordinating Group (NWCG). NWCG qualifications are obtained by a combination of required courses and experience/demonstrated performance. The focuses of wildland qualifications are for operational positions up to and including squad boss, crew/engine boss and strike team/task force leader.

Emergency Response: Response begins with receipt of an emergency page and varies with the availability of personnel, time of day and environmental conditions. Most of the volunteers live in the unincorporated portions of district and have travel times to a fire station of 5-8 minutes. Many of the volunteers are employed outside the district during the workday. Once adequate personnel have arrived, the first apparatus will respond to the incident; other apparatus will respond as additional personnel arrive. Response times are an average of 10-20 minutes for the outlying portions of the District.

Water Supply: The vast majority of the fire district is not protected by fire hydrants. Only Hygiene proper and 3-4 sub-divisions have the standard fire hydrant placement. A large amount of the district is considered rural/ agriculture, with fire hydrant placements sometimes in excess of 1- 1.5 miles apart from each other, thus the need to set up a water tender shuttle operation to supply engines with water for fire suppression. Hygiene currently has 2 water tenders capable of carrying 1800 gallons each to supply an engine in the event of a fire. Additionally, mutual aid agreements are in place for other agencies to provide water support with tender operations.

ASSESSMENT

Process

The district was divided into 12 communities for purposes of conducting the assessment. The boundaries were drawn to enclose structures and residences, based on access, terrain and similar fuel models. The communities do not necessarily correspond to specific subdivisions or road/homeowner association areas, although these were followed to some extent to facilitate the identification of points of contact and simplify communication. The communities are shown on Map 1, Page A-1, identified as follows:

- Town of Lyons (Central)
- Town of Lyons (New Developments)
- Lyons Park Estates
- Stone Canyon/Eagle Ridge
- Steamboat Valley
- North St Vrain/Longmont Dam Rd
- South St Vrain
- N Foothills/Ute Highway/Rabbit Mountain*
- Dakota Ridge*
- Apple Valley
- Spring Gulch
- Blue Mountain/X Bar 7

* Indicates areas of mutual aid response with Hygiene and Berthoud Fire Protection Districts, based on primary access routes.

An initial overview of the district was conducted using LANDFIRE data for slope, aspect, elevation, and Anderson's 13 fuel models for estimating fire behavior.

The Core Team met November 5, 2009 and approved the approach for the CWPP process.

Community surveys were conducted by the Lyons volunteer firefighters. The survey form (see Appendix B) was developed using the rating criteria provided by the National Fire Protection Authority (NFPA) 1144 Standard for Protection of Life and Property from Wildfire, with minor modifications for local conditions. For example, the NFPA criteria uses road mileage from fire station, but due to the condition of local roads, many of which are unpaved and privately maintained, it was determined that travel time from the fire station was a more relevant criteria.

The surveys were conducted at the house level, but aggregated at the community level to achieve an overall community hazard rating. Only residences were surveyed, other structures such as businesses, barns, garages and outbuildings were not evaluated, except to the extent they posed a hazard to the residence. The exception is that residences in the town of Lyons were not individually evaluated; they were evaluated as a group based on predominant conditions.

As part of the survey, neighborhood conditions such as evacuation routes, fire department access, and water sources were evaluated, and safety zones, staging areas and helicopter landing zones were identified.

Issues were identified during the survey process, and preliminary recommendations were developed.

During this same time frame, Chief Hoffman conducted initial public outreach to identify points of contact, and briefed town officials and several of the communities on the process.

The core team met on March 29, 2011 to review the draft CWPP document, results of community assessments, and recommendations. Changes have been incorporated into this report.

Preliminary Assessment

Preliminary data was obtained from LANDFIRE (also known as Landscape Fire and Resource Management Planning Tools), an interagency program for vegetation, fire, and fuel characteristics mapping, sponsored by the United States Department of the Interior (DOI) and the United States Forest Service.

Housing density: see Map 2, page A-2.

Fuel Model: see Map 3, page A-3. Fuel models are a collection of vegetation types, grouped into 4 primary categories (grass, shrub, timber, and slash) which have similar properties with regard to fire behavior, and can be quantified and used as an input for fire behavior models. Anderson's 13 Fire Behavior Fuel Models identified in the district were used, as described below:

Fuel Model 1 Short grass (1 foot)
Fuel Model 2 Grass and understory
Fuel Model 4 Chaparral (6 feet)
Fuel Model 5 Brush (2 feet)
Fuel Model 6 Dominant brush, hardwood slash
Fuel Model 8 Open Crown timber
Fuel Model 9 Closed Crown with Hardwood litter
Fuel Model 10 Timber (litter and understory)
Agricultural
Water
Rock (quarries)
Urban

The primary fuel models occurring in the district and the portion of area covered are: approximately 55% timber, 25% grass, 12% brush, and 8% urban/rock/water. Field surveys showed a significant difference from the satellite fuel model imagery in one case: a large portion of what shows as grass fuel models on these maps is in reality brush fuel model 4 or 6. The main areas where this difference was noted are in X Bar 7/Blue Mountain, Stone Canyon, Dakota Ridge, and Steamboat Valley.

Slope: see Map 4, page A-4. Slopes greater than 30 percent significantly increase wildfire risk. Slope generally increases as you move toward the west across the district.

Combined Risk: see Map 5, page A-5.

The combination of Fuel Model and Slope were used to depict combined risk. Fuel Model and slope were classified based on NFPA point values, and then the values were added to obtain the combined risk.

Aspect: see Map 6, page A-6. Aspect is the direction of the slope, and significantly impacts the density and curing of vegetation. North facing slopes tend to have denser, but moister vegetation. South and west facing slopes are generally the driest.

Elevation: ranges from 5030 to 9280 feet. See Map 7, page A-7.

Assessment methodology

Individual houses were assessed by the firefighters using the scoring sheet shown in Appendix B. This scoring sheet was adapted from NFPA 1144, with minor modifications for local conditions. The total number of points available is 188. The overall rating scale is shown below.

Hazard Rating Scale	
Low	< 40
Moderate	41-70
High	71-120
Extreme	> 121

The neighborhood access and fire service access items were assessed for the community as a whole. Where different conditions exist within a community, the predominant condition was used, and then adjusted proportionately to incorporate the worst-case scenario.

Each house was evaluated and the results were averaged for the community. There is no intention at this point to provide individual scoring results for a particular residence. Only residences were evaluated. Other structures were considered only to the extent they impacted the risk to the residence. The long-term goal is to prepare individual pre-plans for each business and residence at a future date. Where access to individual property could not be obtained due to locked gates, the assessment was made based on the extent to which the property was visible from accessible areas and from aerial photographs. Houses in the Town of Lyons were not surveyed individually; the predominant conditions were evaluated.

This assessment is intended for educational purposes and is not a tactical firefighting assessment.

Summary of Results of Neighborhood Assessments

The following table shows the summary of survey results. All of the neighborhoods were rated high or moderate wildfire risk. This seems to make sense when you place the study area in context of the entire Colorado Wildland Urban Interface. There are areas in the mountains and canyons which pose more extreme risk, with steeper slopes, denser vegetation, less setback, more wood roofs and construction, etc. On the other hand, the foothills location of the district is at higher risk than the grassy plains.

The detailed score sheet and write-up for each community are included in Appendices D through O. Homeowners are requested to review the Appendix which pertains to their particular community, along with Appendix C which contains detailed explanations of the terms and recommendations.

Wildfire Risk and Hazard Severity Assessment Neighborhood Results Summary			
Neighborhood	# Houses	Score	Rating
North St Vrain	76	100.2	High
Lyons Park Estates	65	99.1	High
Spring Gulch	130	94.3	High
Dakota Ridge	34	89.6	High
X-Bar 7/Blue Mountain	132	88.2	High
Stone Canyon/Eagle Ridge	42	86.6	High
Steamboat Valley	16	85.5	High
Town of Lyons (Central)	350	79.5	High
North Foothills/Ute Highway/Rabbit Mountain	43	71.3	High
South St Vrain	38	66.3	Moderate
Apple Valley	129	57.5	Moderate
Town of Lyons (New Developments)	346	41.4	Moderate

Overall neighborhood priorities should be weighted by factoring in the number of residences. Accordingly, Spring Gulch is considered the number one priority due to the number of residences impacted.

Summary of Findings

Average Lot Size: About 13 acres. Varies from less than one acre to 35 acres; very few lots with 40 or more acres.

Access Ingress/Egress, Response Time: Nearly all communities have single ingress/egress routes. Response times in many areas of the district are in excess of 20 minutes along privately maintained, reasonably well-graded narrow dirt roads, some of which are also steep. Four-wheel drive is a necessity for fire apparatus in most areas. A few areas in Dakota Ridge, X-Bar 7, and the western portion of Longmont Dam Road are extremely remote from responding station.

Predominant Fuel Models: 55% timber (Fuel Models 8 and 9), 25% grass (Fuel Model 2), 12% brush (Fuel Models 4 and 8), and 8% urban/rock/water.

Terrain/Topography: Foothills. Average slope for unincorporated areas is 16%. Slopes range from generally flat for Town of Lyons, up to an excess of 60%.

Home Construction: Varies by age of home and building codes in effect at the time of construction. Many homes were built prior to the 1990s when Firewise building construction codes began to be implemented. Only a few houses have wood shake shingles, but over 50% have wood siding, and open wood decks.

Defensible Space: Much more work needs to be done throughout the district. A few newer houses have completed basic mitigation, but most need improvement in all zones. Many residences have combustible structures, firewood piles and other debris within 30 feet of homes.

Water Supply: Severely inadequate, major issue. The only pressurized water sources are in the Town of Lyons, and along Apple Valley Road and Ute Highway, serving just over half of the residences and less than 2 square miles, or 3% of the district. Very few cisterns are installed in the unincorporated areas.

Special Hazards: Electric power lines over roadways, combustible material adjacent to above ground propane tanks. Close exposures of adjacent wood houses and structures in central Town of Lyons. Unknown weight capacity and/or unsafe bridges prevent access by fire apparatus to several residences.

Other Issues:

Insufficient water supply in unincorporated areas of the district.

Potential for entrapment in event of a wildfire for residents in neighborhoods with single ingress/egress route.

Need to identify Safety Zones for all communities.

Ingress/egress hazards due to vegetation along access roads.

Delayed fire department access due to locked gates.

Insufficient defensible space around residences.

Ambiguous, missing, and poorly visible street and address markings, and some addresses with numbers out of sequence, not following right/left conventions, or not adhering to the mountain addressing system.

Inadequate turnarounds and pullouts for fire apparatus on some narrow roads and many long driveways.

Unknown weight capacity and/or unsafe bridges prevent access by fire apparatus to several residences.

Dense and unhealthy forest in surrounding open space and undeveloped lands threatens adjacent communities.

RECOMMENDATIONS

Priority 1: Safety of Residents and Firefighters

Ensure Safe Ingress/Egress:

Work with residents and HOAs to identify and maintain safety zone for each community with possible egress issues.

Prioritize mitigation products to reduce encroaching trees and brush to allow safe ingress/egress along primary access roads, particularly:

- Spring Gulch: Boulder County portion of Blue Mountain Road, Spring Gulch Drive, Colard Lane, and Pioneer Road.
- Lyons Park Estates: all roads.
- North St Vrain: Longmont Dam Road in Button Rock Preserve.
- Dakota Ridge: Indian Mountain Road, Moss Rock Court, Redstone Court and Thunder Road.
- X-Bar 7/Blue Mountain: Grey Mountain Drive and Blue Mountain Trail.
- Stone Canyon/Eagle Ridge: Eagle Ridge Road, Lewis Lane, north end of Stone Canyon Road.
- Foothills/Ute: Rabbit Mountain Rd, Pointe View, and Highland Drive.

Investigate emergency evacuation routes from the following communities that have only one ingress/egress: Spring Gulch, X-Bar 7, Lyons Park Estates, Longmont Dam Road, Dakota Ridge, and Eagle Ridge. Proposed evacuation routes discussed in the detailed community sections have not been evaluated and ARE NOT OPEN AT THIS TIME.

For proposed evacuation routes: Obtain permissions, improve road surface, mitigate vegetation and label emergency evacuation routes for communities with only one ingress/egress route. Evacuation routes may cross private property. They should be clearly marked and only used in case of emergency.

Current evacuation routes are shown in blue on the individual community aerial maps. Sections of evacuation routes requiring mitigation are shown in red on maps A-8 through A-14 at the end of this section.

Improve Emergency Response Time:

Homeowners ensure address markings are readily visible from both directions (with large, contrasting, preferably reflective numbers), located at the base of the driveway, and for remote locations, at every turnoff or fork in the road leading to the house. Both Lyons and Hygiene Fire Departments will investigate obtaining standardized, large, reflective address signs and will work with road boards, HOAs and private homeowners to initiate a standardized address marking system. These signs may be available for sale from either of the departments or available for individuals to purchase through a web site link posted on both the districts web pages.

Owners with locked gates install Knox box (preferred), or provide gate codes or keys to the applicable fire department.

Verify and post weight limits on all bridges, particularly 28300 block of South St Vrain Drive, 16000 block of North St Vrain Highway, all driveways along Longmont Dam Road that cross the river, and Highland Drive (which affects both fire districts). This process will be done in conjunction with Boulder County Transportation Department.

Replace missing street signs in Lyons Park Estates, County Road 69/Bradford St, and Groover St. Standardize Street signs in Spring Gulch. Clearly label ambiguous road directions at all intersections in Spring Gulch, Lyons Park Estates, Eagle Ridge and Dakota Ridge. This will be a cooperative effort with the following agencies, organizations or individual homeowners in the affected area:

Lyons Park Estates- Boulder County Transportation Department
County Road 60/ Bradford St- Boulder County Transportation Department
Groover St- Town of Lyons
Spring Gulch, Dakota Ridge and Eagle Ridge- Applicable Road Associations

Homeowners and Road Associations install turnarounds and pullouts for fire apparatus on narrow roads and long driveways.

Lyons FPD Provide updated map info to Boulder County; Boulder County update mountain address maps for countywide mutual aid assistance.

Priority 2: Reduce Wildfire Risk

Improve Community Awareness:

Promulgate CWPP

Brief community, stakeholders, and HOAs regarding CWPP results and recommendations.

An educational effort will be put together for both fire districts which include community meetings as well as working with road boards, HOAs, and individual home owners, discussing the dangers of wildfires, fire prevention and education, healthy forest practices and well as the needs of the fire districts to improve defensible space, fuel breaks and other mitigation practices. Both Districts will also post a copy of the CWPP on their web site with information and links to provide further education.

Homeowners take advantage of free wildfire assessments offered by fire department personnel.

Improve Defensible Space and Mitigation:

Homeowners need to improve defensible space and implement Firewise maintenance practices, especially zones 1 and 2 and those with wood sided houses, wood decks and other combustible structures. See Appendix C for more detailed information.

Boulder County Parks and Open Space prioritize a mitigation project for a fuel break in Heil Valley Ranch around Lyons Park Estates, and in the County open space south of Spring Gulch.

USFS prioritize a mitigation project for a fuel break west of Spring Gulch and the proposed projects north of Spring Gulch and north of Button Rock reservoir.

Proposed mitigation projects for community firebreaks in the most hazardous areas are shown in yellow on maps A-8 through A-14 following this section.

Provide mitigation assistance for homeowners such as grant information and paid services of the Lyons Fire Mitigation Team.

In addition to the county programs detailed in the Homeowners Appendix, work to develop ways to locally sell, dispose of or donate the left over biomass from mitigation efforts. These include such things as fire wood sales, chipping and selling or donating chips to homeowners, nurseries or other commercial vendors, working with landowners to either do prescribed slash pile burns, or disperse chips/ limbs on the property itself, as well as looking for grant possibilities to assist the fire department and or home owners with the disposal of all products.

Homeowners are encouraged to improve ignition resistant construction of residences. Where possible or when remodeling, replace wood shake shingles, siding, decks, connecting fences and structures with ignition resistant materials.

Priority 3: Improve Wildland Firefighting Capability

Improve Water Supply:

Identify specific locations for drafting from North and South St Vrain Creek and reservoirs.

Consider dry hydrants for year round water sources such as ponds.

Community cisterns are needed throughout the district, particularly for the following communities: Spring Gulch, Lyons Park Estates, Stone Canyon/Eagle Ridge, Apple Ridge, Dakota Ridge, and Xbar7/Blue Mountain. Work with HOAs to pursue locating, grants and funding opportunities.

Install additional hydrant on Ute Highway at North 53rd Street in vicinity of water supply tank.

Poll homeowners to update cistern list in Appendix C.

Improve Fire District Capabilities:

Fire districts should develop detailed preplans for improved fire and other emergency response. This is a time consuming task that will require homeowner participation. Lyons fire will develop a homeowner survey for distribution during CWPP educational events to begin to collect information for this purpose. Field surveys will be prioritized based on areas and properties of highest risk.

The fire districts should continue training personnel in wildland fire operations, both training of additional personnel in basic skills and advanced training for the more experienced individuals.

Lyons fire plans to further develop and add personnel to the Lyons Mitigation Crew, and continue training on mitigation practices. They should continue efforts to obtain grants to assist with the purchase of mitigation equipment such as chippers, saws, and crew trucks, and provide personal protective equipment for the mitigation crew members.

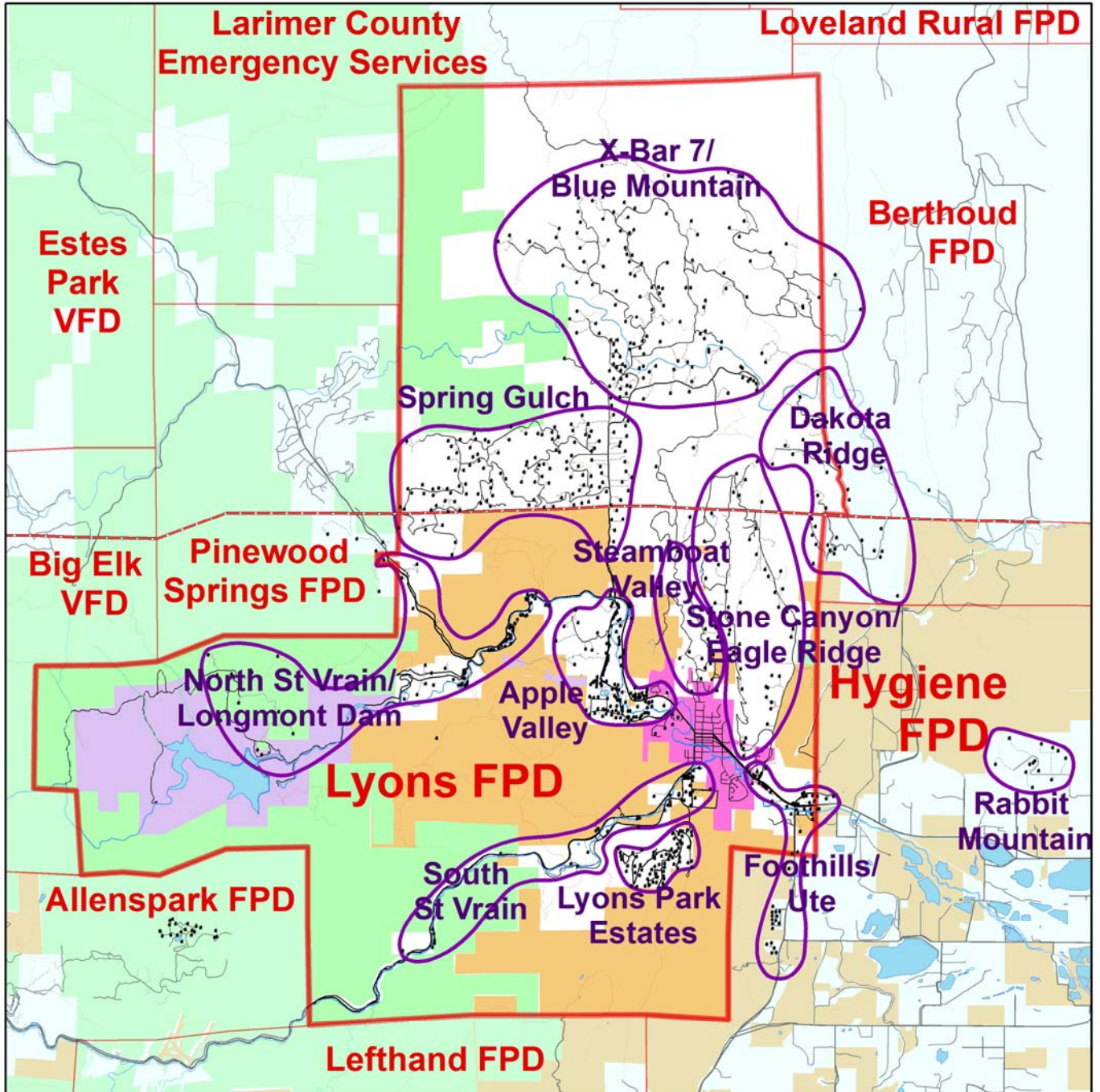
Both districts should stress public information campaigns to improve wildfire preparedness, as well as mitigation efforts and healthy forest and fuels reduction. They will continue to update the public of any needs or changes that may arise in the future.

Lyons fire should continue recruitment efforts for new firefighters to respond to both stations, particularly for daytime response, and continue training all new recruits in the areas of fire suppression, EMS and mitigation.

Lyons fire is establishing an auxiliary group to assist the district in a support role for emergencies, special events, public education, grant writing and other non-firefighting roles.

Both districts should continue to pursue funding for firefighting equipment and training to ensure a high state of readiness in the event of a wildland fire incident.

Major Land Ownership & Communities

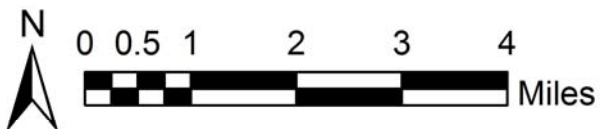
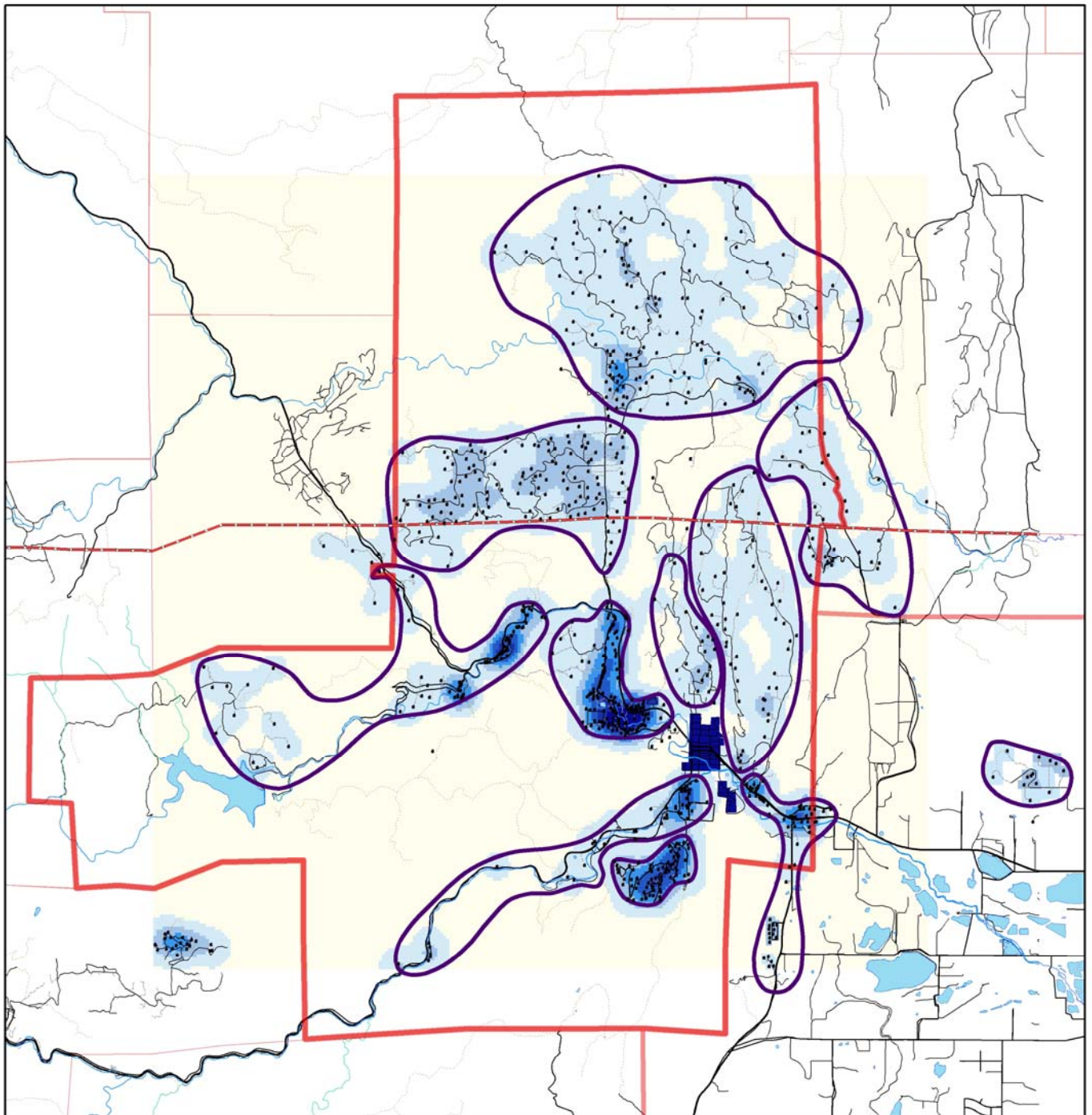


A-1

Land Ownership

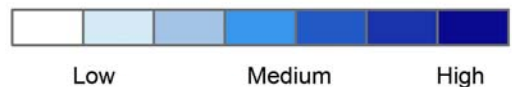
-  County Line
 Fire Districts
 Communities

Housing Density

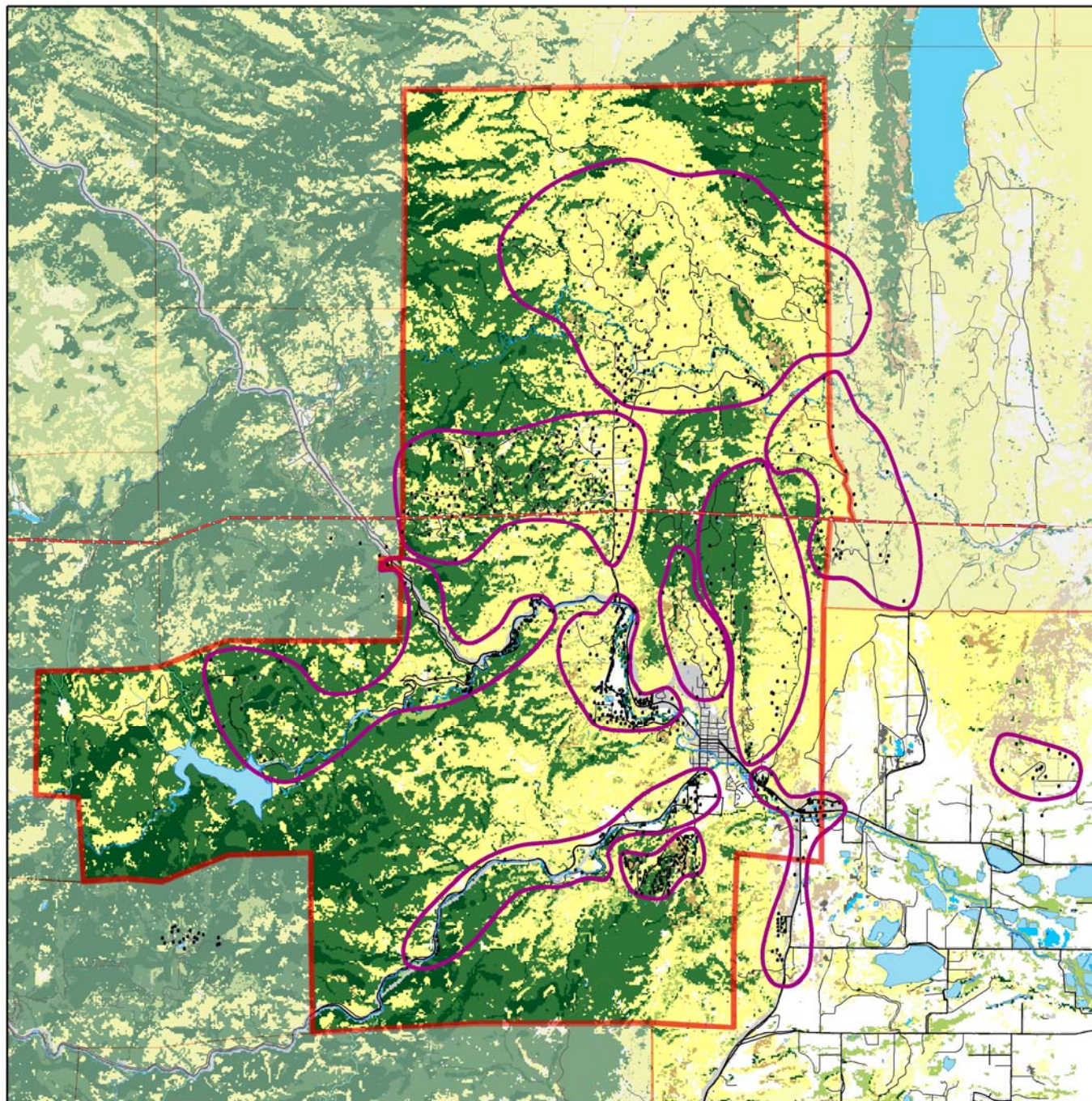


A-2

Density



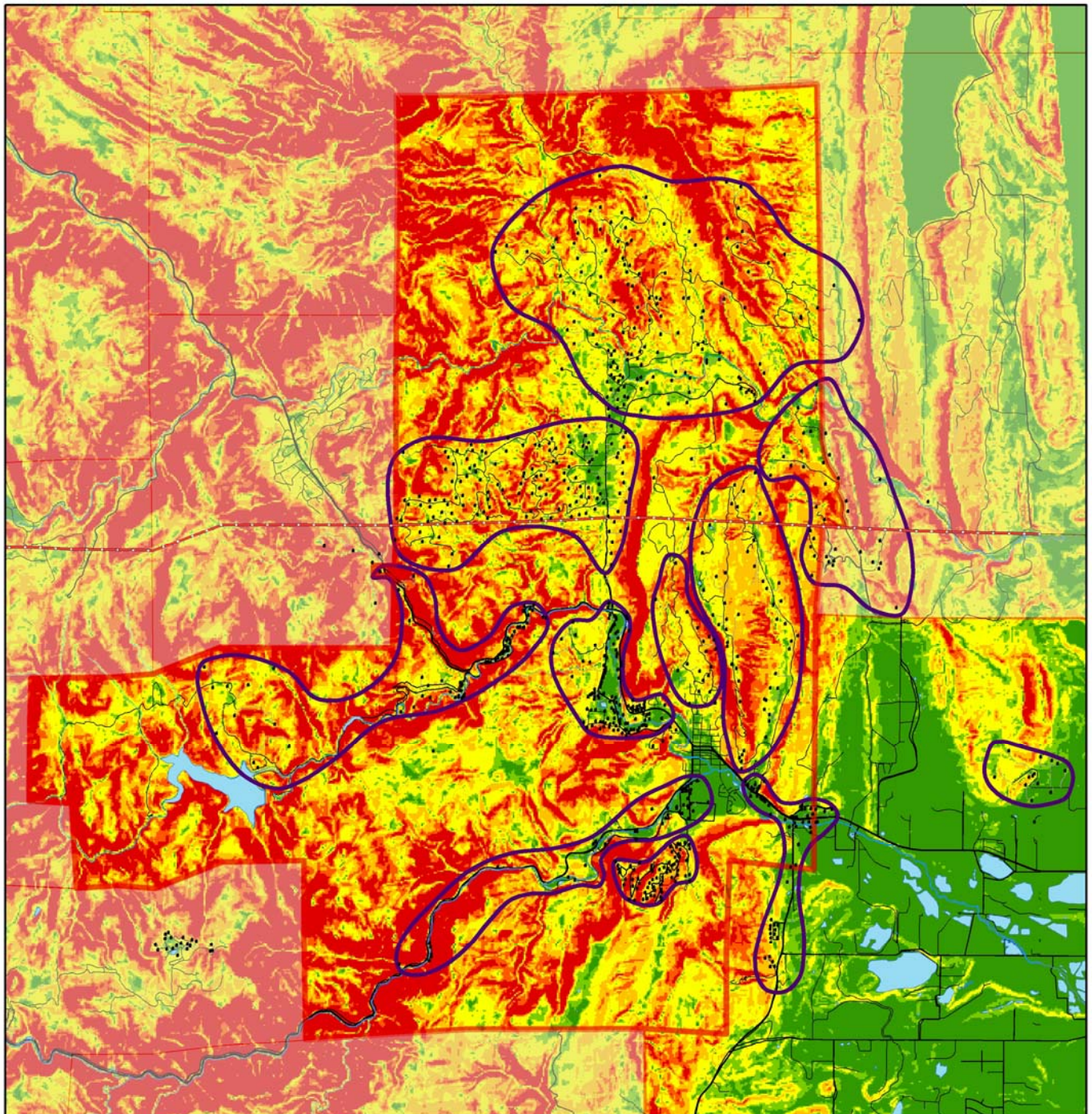
Anderson's 13 Fire Behavior Fuel Models



13 Fuel Model

1 Grass	5 Brush	9 Tree	Agricultural
2 Grass	6 Brush	10 Tree	Water
3 Grass	7 Tree	Urban	Quarry
4 Brush	8 Tree		

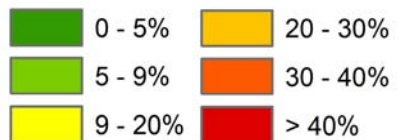
Lyons FPD Slope



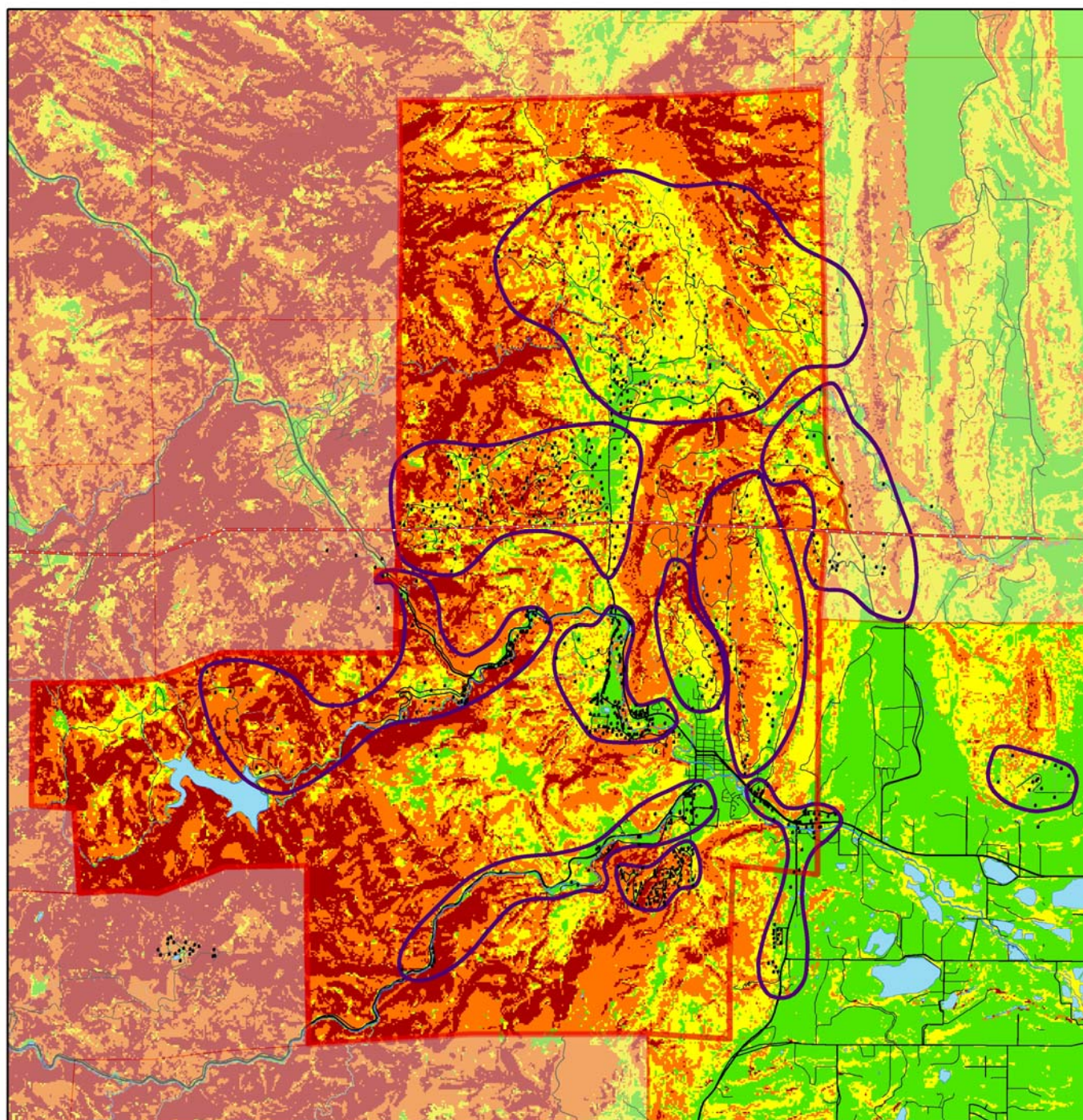
0 0.5 1 2 3 4 Miles

A-4

Percent Slope



Combined Wildfire Risk (Sum of Slope + Fuel Model)



0 0.5 1 2 3 4 Miles

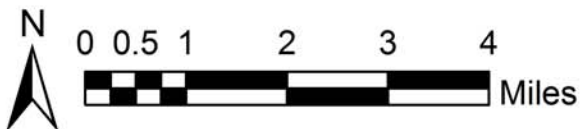
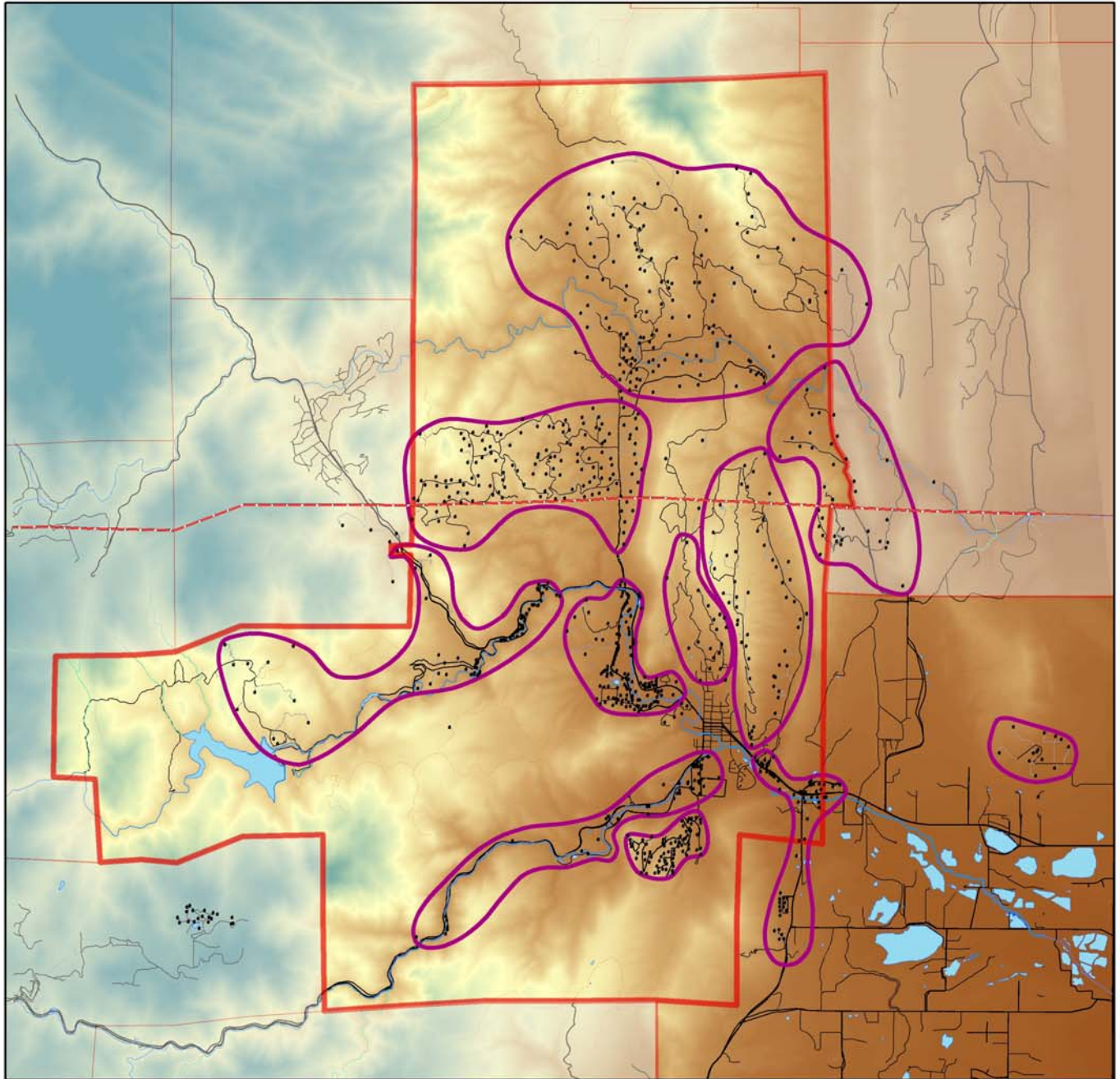
A-5

Combined Wildfire Risk

Sum of Fuel Model + Slope

Low	High
Moderate	Extreme

Lyons FPD Elevation

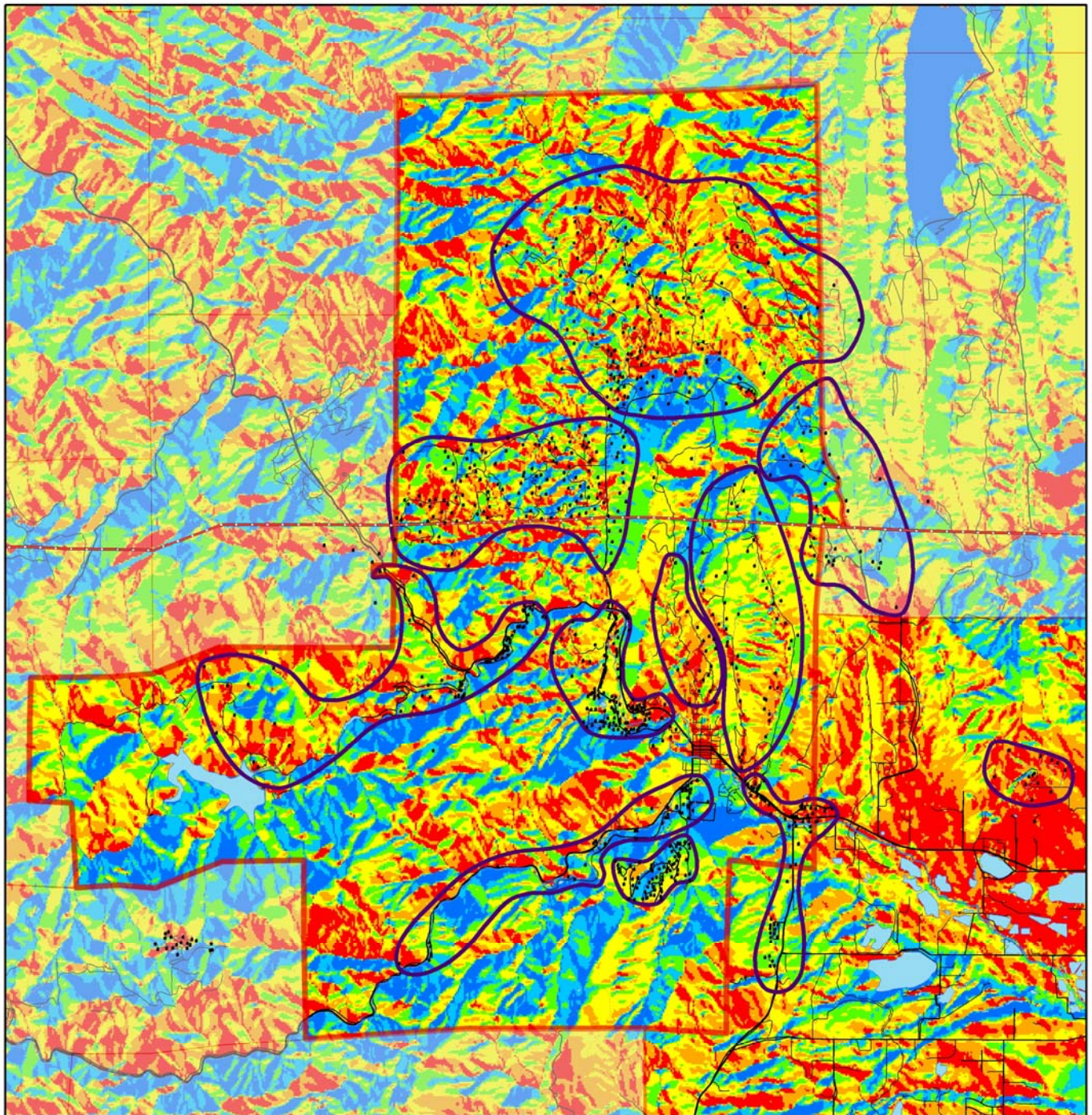


A-6

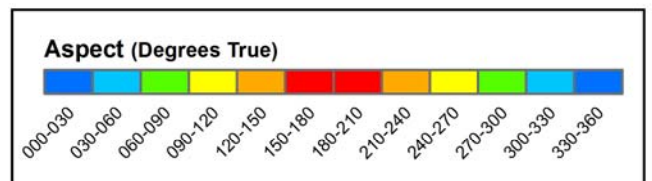
Elevation (Feet)



Lyons FPD Aspect

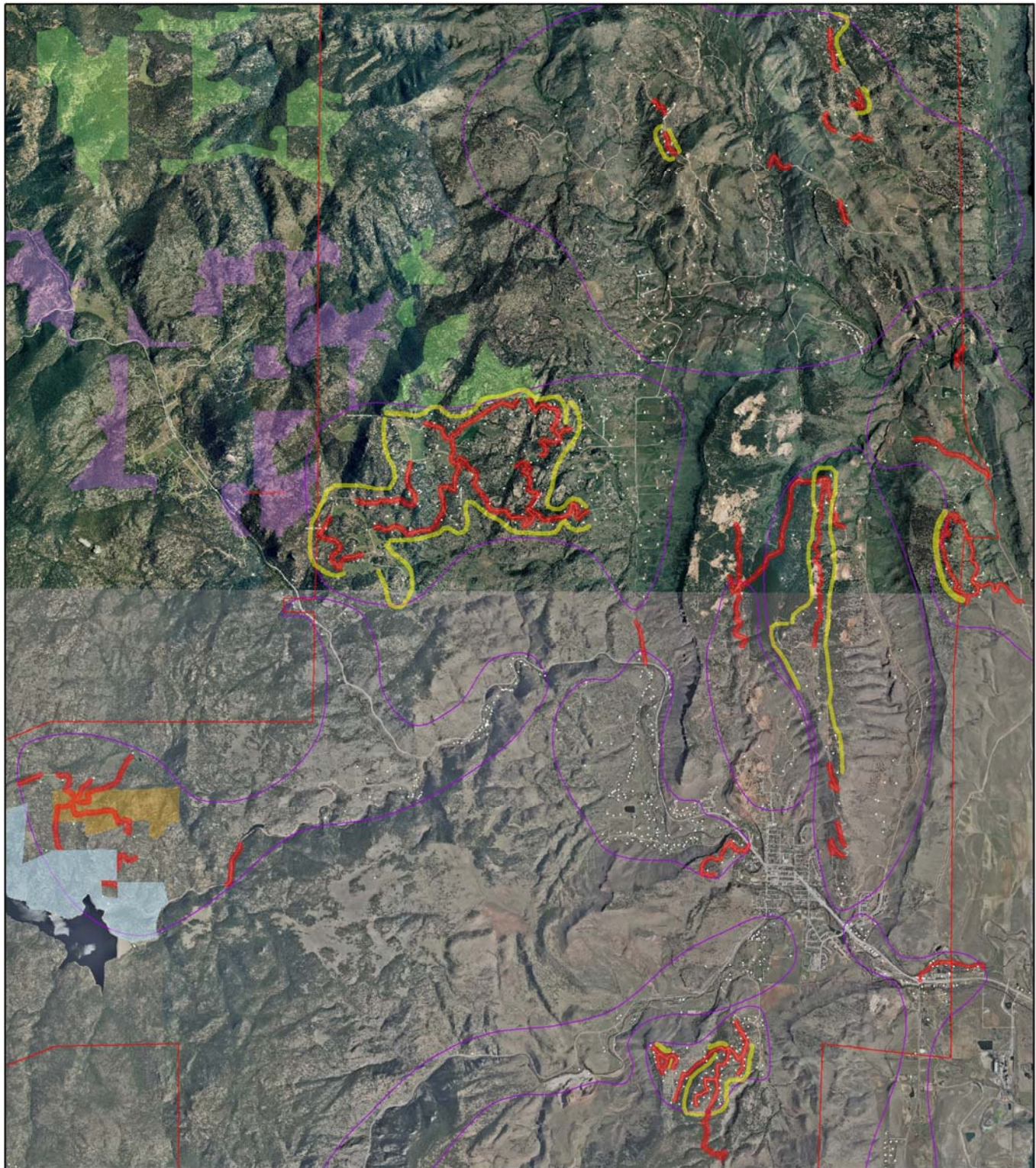


A-7



LYONS FPD

Proposed Mitigation Projects



0 0.25 0.5 1 1.5 2
Miles



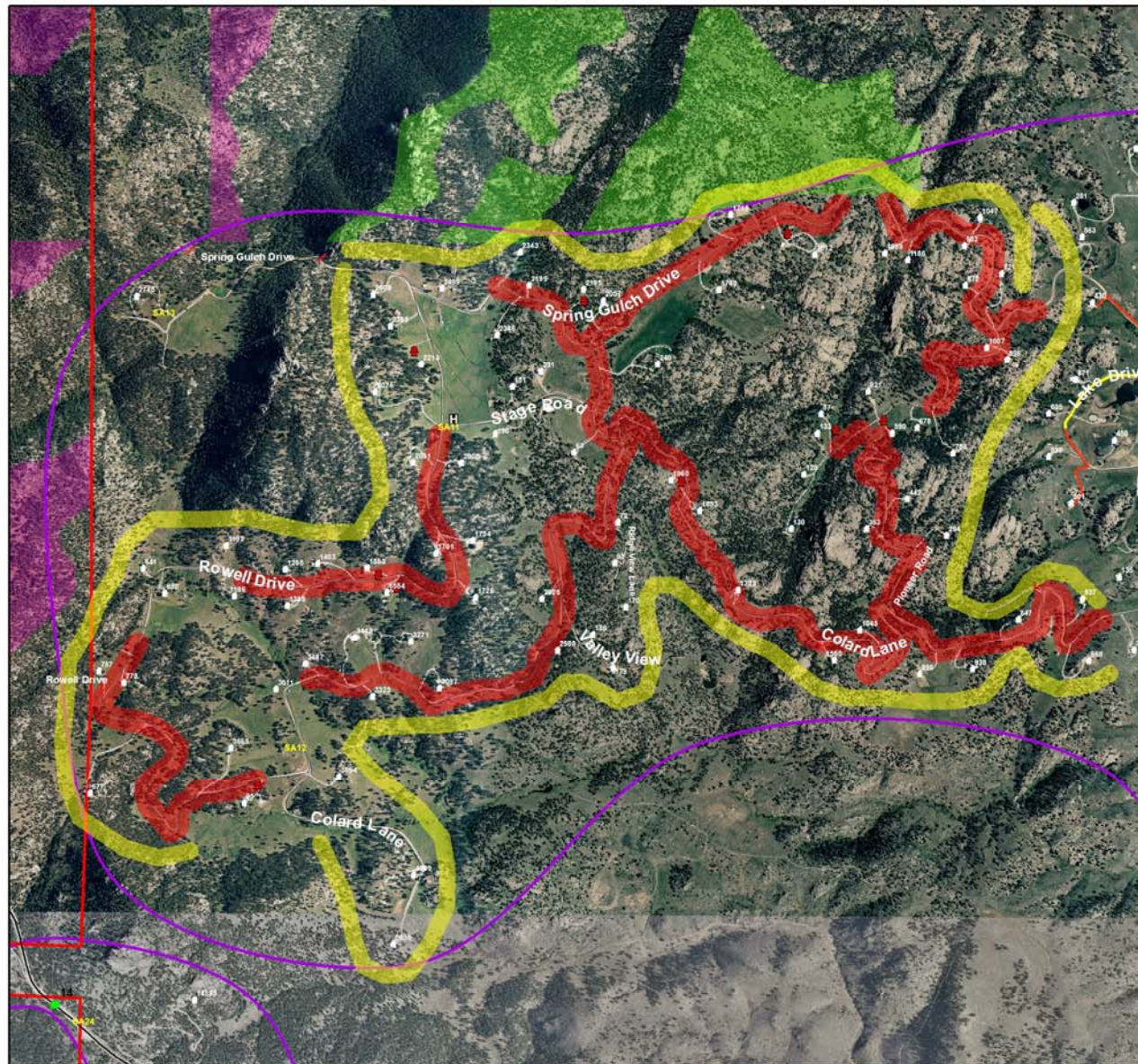
A-8

Mitigation Projects

- | | |
|----------------------|--------------------------------|
| Community Fuel Break | USFS Proposed Mitigation |
| Evacuation Route | USFS Planned Mitigation |
| Watershed Mitigation | USFS Completed Mitigation 2009 |

Proposed Mitigation Projects

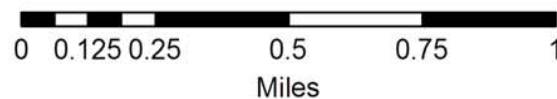
Spring Gulch



Mitigation Projects

Type

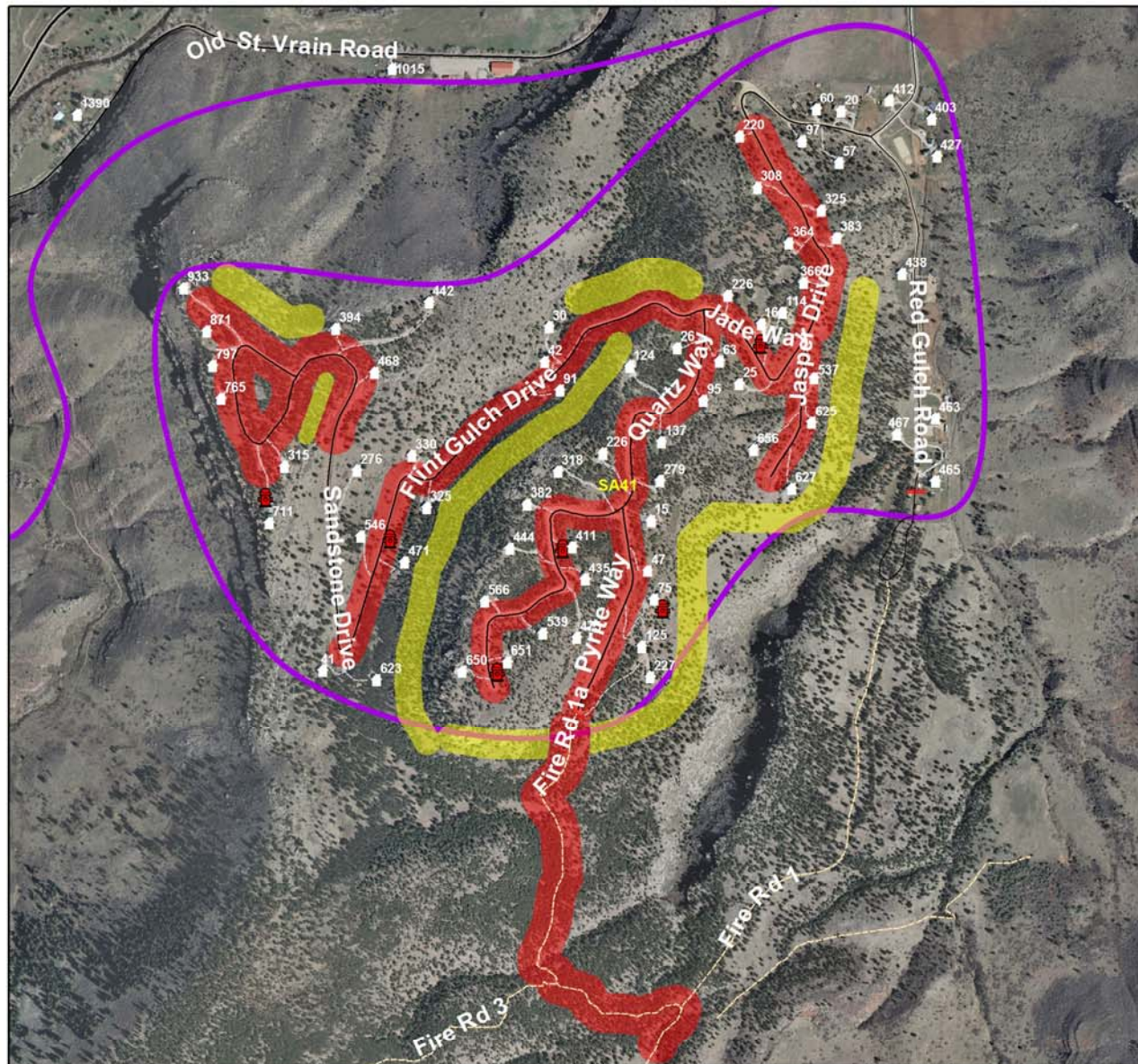
-  Community Fuel Break
-  Evacuation Route
-  Lyons FPD Outline
-  CWPP Communities
-  USFS Completed Mitigation
-  USFS Planned Mitigation



A-9





Proposed Mitigation Projects

Lyons Park Estates



Mitigation Projects

Type

-  Community Fuel Break
-  Evacuation Route
-  Lyons FPD Outline
-  CWPP Communities

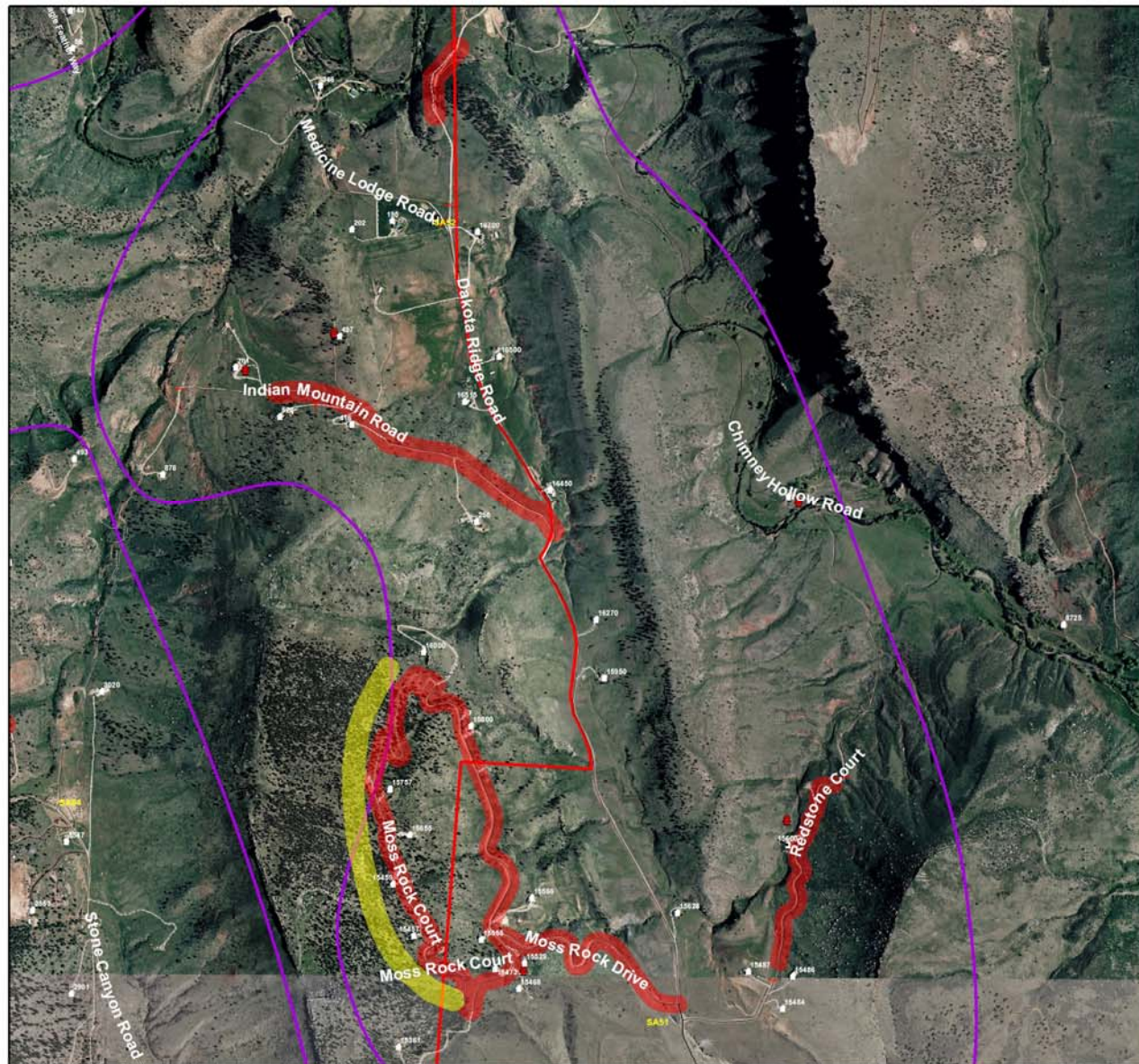
0 0.050.1 0.2 0.3 0.4
Miles



A-10





Proposed Mitigation Projects

Dakota Ridge



Mitigation Projects

Type

-  Community Fuel Break
-  Evacuation Route
-  Lyons FPD Outline
-  CWPP Communities

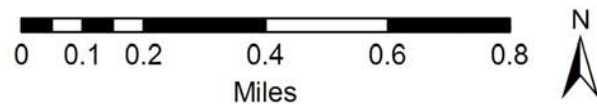
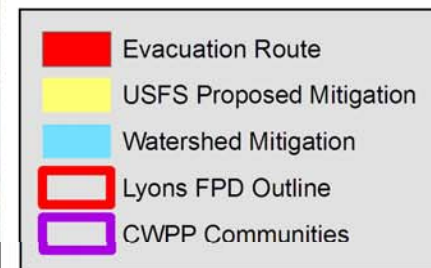
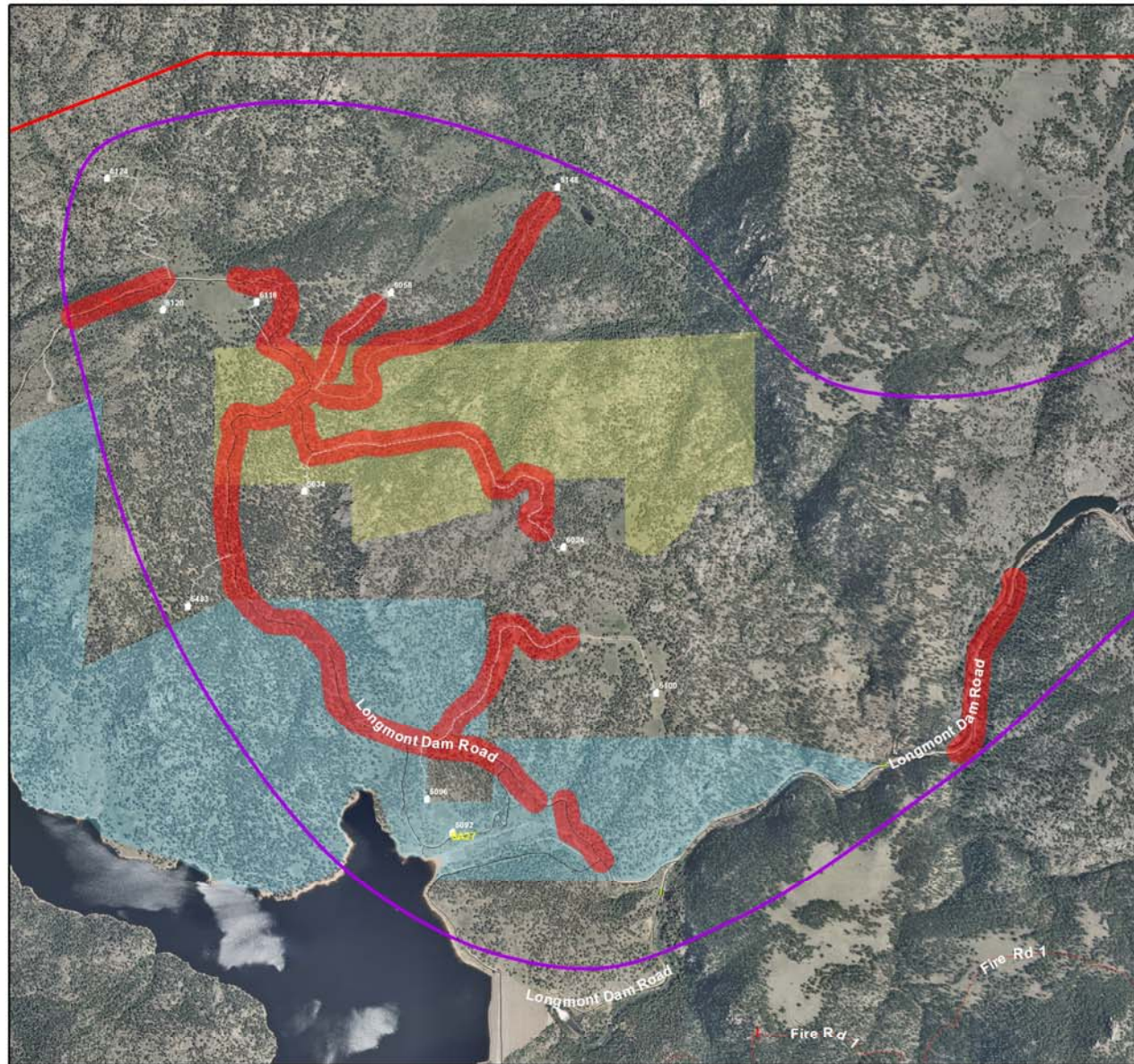
0 0.125 0.25 0.5 0.75 1
Miles



A-11

Proposed Mitigation Projects

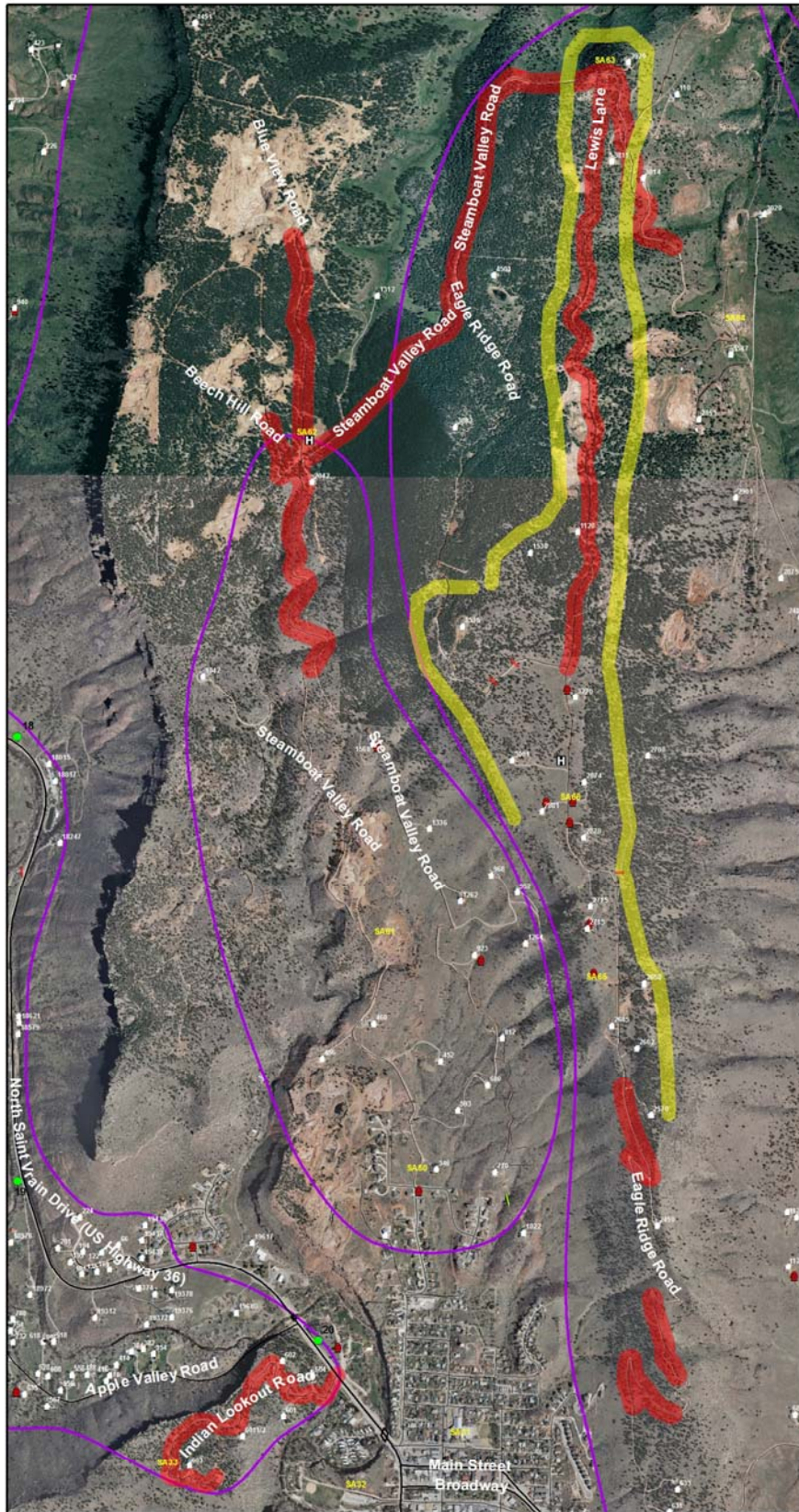
North St Vrain
Community
Longmont Dam Road
Inside Button Rock



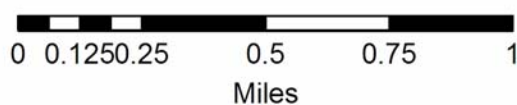
A-12

Proposed Mitigation Projects

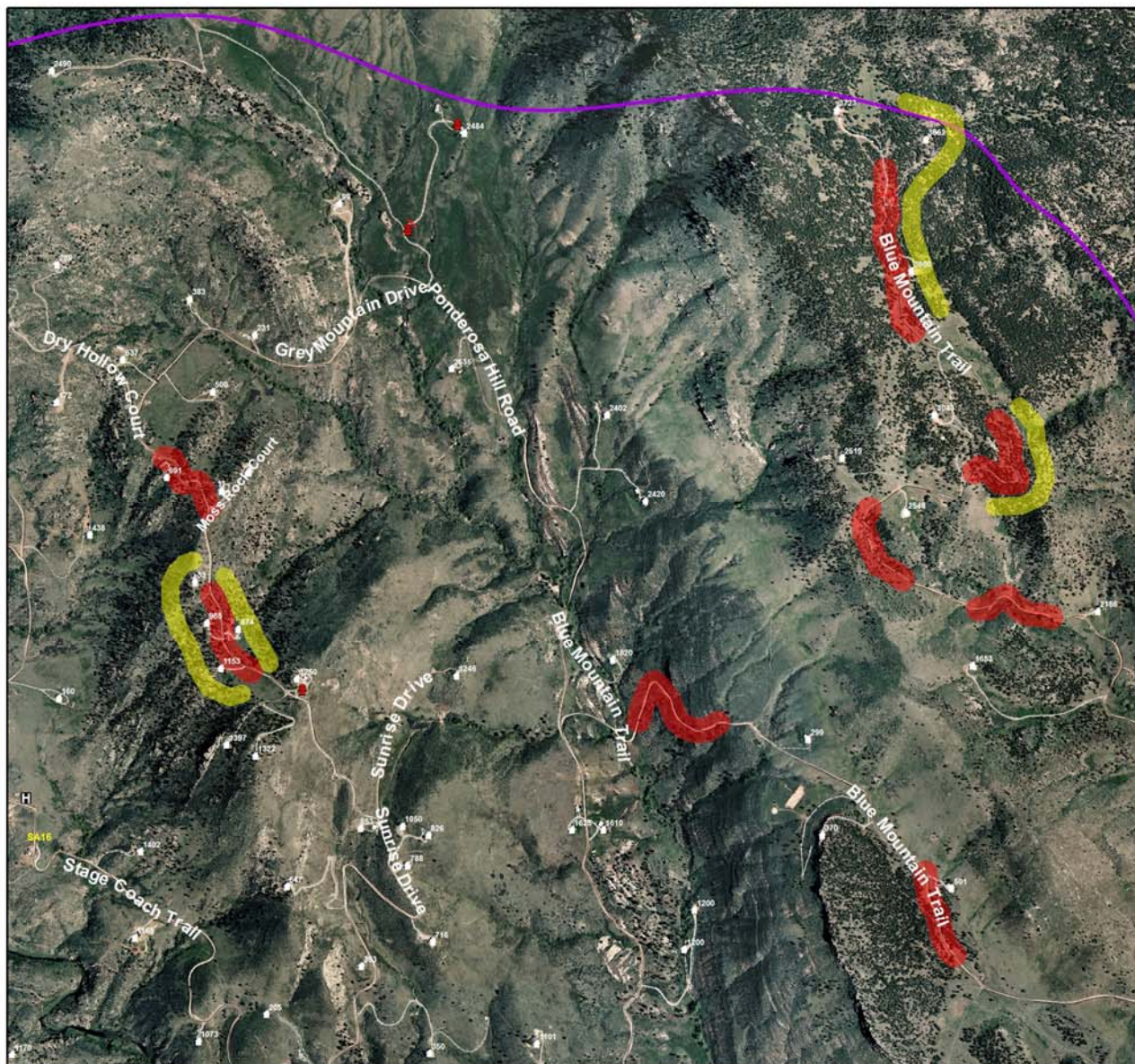
Stone Canyon
Eagle Ridge
Steamboat Valley
Indian Lookout Rd



Mitigation Projects	
Type	
	Community Fuel Break
	Evacuation Route
	Lyons FPD Outline
	CWPP Communities



A-13







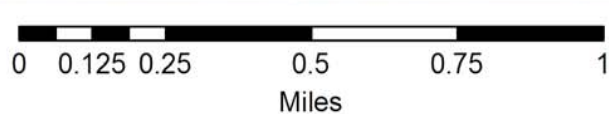
Proposed Mitigation Projects

Blue Mountain X-Bar 7

Mitigation Projects

Type

-  Community Fuel Break
-  Evacuation Route
-  Lyons FPD Outline
-  CWPP Communities



A-14

APPENDIX B ASSESSMENT CRITERIA

Wildfire Risk and Hazard Severity Assessment Master Scoring Sheet		
Means of Access to Neighborhood		
Fire Department Response Time		
	< 5 Minutes	1
	5 – 10 Minutes	3
	10-20 Minutes	6
	> 20 Minutes	9
Ingress and Egress		
	One Road In and Out	7
	2 or More Roads In and Out	0
Road Width		
	< 20 Feet	4
	20 – 24 Feet	2
	> 24 Feet	0
Road Condition		
	Paved, < 5% grade	0
	Paved, >5% grade	2
	Unpaved, graded, <5% grade	2
	Unpaved, graded, >5% grade	5
	Not Graded or Not Maintained	7
Fire Service Access		
	Insufficient Pullouts	2
Street Signs		
	Missing or Other Problems Noted	2
Vegetation Along Access Route		
	Water/Urban/Rock	0
	Agricultural/Fuel Model 1 or 2	1
	Fuel Model 5/6/7/8	5
	Fuel Model 9	8
	Fuel Model 10	12
	Fuel Model 11 (Slash)	15
Other Access Hazards		
	As Noted	2

Below Items were evaluated for each house, then averaged for the neighborhood:		
Vegetation (Fire Behavior Fuel Models)		
	Water/Urban/Rock	0
	Agricultural/Fuel Model 1 or 2	5
	Fuel Model 4/5/6/7/8	10
	Fuel Model 9	15
	Fuel Model 10	20
	Fuel Model 11 (Slash)	25
Defensible Space Mitigation		
Zone 1: within 30 ft		
	Complete	0
	Partial	10
	None	15
Zone 2: 30 – 100 ft		
	Complete	0
	Partial	3
	None	7
Zone 3: beyond 100 ft		
	Complete	0
	Partial	1
	None	3
Topography		
Slope within 100 ft		
	Flat	0
	1 - 9%	1
	10 – 20%	4
	21 – 30%	7
	31 – 40%	8
	> 41%	10
House Setback from slope >30%		
	Flat N/A	0
	Setback at least 30 ft	1
	Setback < 30 ft	5
Hazardous Topography		
	Steep Slope, Chimney, Saddle, Box Canyon	5
Firefighter Access		
Address Visible		
	Visible and reflective	0
	Visible, non-reflective	1
	None or Not Visible or Difficult to Locate	3
Driveway Length		
	< 100 ft	0
	100 – 300 ft	1
	> 300 ft	2

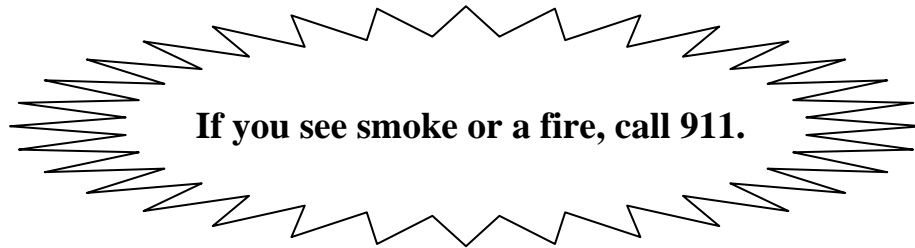
	Bridge not Safe for Engine or no Engine Access	3
Turnaround for Engine		
	Yes or N/A (House Within 100 ft of Road)	0
	No or Bridge not Safe for Engine	2
Driveway Clearance for Engine		
	Yes or N/A (House Within 100 ft of Road)	0
	No or Bridge not Safe for Engine	2
Building Construction		
Roofing Material		
	Metal, Asphalt, other Non-combustible	0
	Wood Shake	25
Siding		
	Non-combustible: Stucco, Metal, Cement Board	0
	Ignition Resistant: Log, Heavy Timber	5
	Combustible: Wood, Vinyl	10
Decks		
	No Deck or Non-combustible: Metal, Concrete	0
	Ignition Resistant, and Fully Enclosed or Heavy Timber	5
	Combustible or Open Below	10
Combustibles within 30 feet	Fence, Woodpiles, Shed, Trash, etc	
	Yes (Depending on Severity)	5-10
	No	0
Firefighting Water Availability		
	Hydrant 500 gpm < 1000 ft from House	0
	Hydrant 250 gpm < 1000 ft from House	1
	Cistern > 15,000 gallons within 1000 ft	3
	Cistern < 15,000 gallons within 1000 ft	5
	None within 1000 ft	10
Utility Hazards		
Aboveground Gas or Propane		
	Above Ground Gas Lines or Propane Tank	3
	None or Buried Lines/Tank	0
Aboveground Electric Wires		
	Above Ground Lines to House or Across Access	2
	Buried Electric, No Hazard	0
Maximum Points		188
Hazard Rating Scale		
Low		< 40
Moderate		41-70
High		71-120
Extreme		> 121

APPENDIX C

HOMEOWNERS APPENDIX

This appendix is designed to be read in conjunction with the neighborhood assessment for your particular community. It explains some of the terms and reasons for many of the ratings used in the assessment, and why certain circumstances increase your wildfire risk. It explains in greater detail the actions to take in response to the recommendations. It emphasizes items within your control and explains steps can you take to reduce your wildfire risk. It also provides handy checklists and resources for homeowners.

There is no guarantee of protection for a particular home. However, every action you take incrementally reduces the risk of fire spreading to your home and makes it easier for the firefighters to defend it if a fire is nearby.



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Explanation of Terms and Criteria Used in Neighborhood Assessment

Defensible Space: The area around a structure where fuels and vegetation are treated, cleared or reduced to slow the spread of wildfire towards the structure. This accomplishes two things: it reduces the chance of heat, flames and blowing embers catching the house on fire, and gives firefighters room to maneuver around the house with hoses in order to protect the structure.

30 foot rule of thumb: keep flammable materials at least 30 feet from the house. This includes firewood. Firewood should be stacked at least 30 feet from the structure. Avoid storing combustible materials downhill from the structure.

Recommend surrounding the house by at least 5 feet of non-flammable material such as pavement, gravel, pavers or flagstones.

Flame heights are typically 2-3 times the height of the fuel. Therefore, minimize flame heights and intensity by mowing or trimming grasses to less than 6-8 inches within 30 feet of the house.

Green plants do not burn readily, therefore well-watered foundation plants, deciduous (broadleaf) trees, and green lawns are considered acceptable. However, remember to clear dead leaves and branches in the fall and keep grass mowed.

Junipers are particularly dangerous; because of the oil content they have a tendency to catch fire more quickly than other plants. They are not recommended as foundation plants or within 30 feet of the structure.

Ladder Fuels: these are small shrubs and plants beneath a tree, as well as dead limbs close to ground level. Remember that flames can be 2-3 times the height of the material. So either limb the tree to 2-3 times the height of plants below, or remove or trim the lower plantings.

Topography: If your house is not set back at least 30 feet from the top of a steep slope, gulch or gully, you should be aware that this is a particularly dangerous location and you should pay extra attention to minimizing the fuels at/near the top of the slope, and between the slope and the house.

Construction: Construction standards for new homes follow the latest building codes for ignition-resistant construction. The same concepts can be used to retrofit an existing home to reduce the risk of fire. Review the building and planning department website for your county for specific details.

Wood Shake Shingle Roofs: the single greatest wildfire risk item under the homeowner's control. If a single burning ember lands on the roof, the fire will spread so quickly that the structure is virtually impossible to save. Although expensive to replace, there may be significant savings on homeowners insurance to offset the cost.

Wood decks: the second greatest risk item from home construction factors. Burning embers can catch the deck on fire, which will quickly spread to the main structure. Composite or non-flammable decking is more fire-resistant. Also, most decks are open underneath, which can trap heat and embers, and spread the fire faster. Homeowners should close in the area under the deck with a solid (preferable non-flammable) material. Do not store any flammable materials under the deck.

Wood siding: if you have wood siding (or vinyl, which melts in a fire), it is particularly important to keep all flammable materials at least 30 feet away from the home. Consider facing the lower 3 feet with a non-flammable material such as stone or cement board.

Fire Department Access: If your driveway is more than 100 feet long and does not provide sufficient room to turn around a fire engine, it will have to back in, causing a delay in response time. Consider installing a turnaround if applicable. The driveway must be 12 feet wide, and clear of vegetation for 2 ft beyond on both sides and to a height of 13ft 6 in for adequate fire engine access.

Locked Gates: Many driveways and some roads have locked gates to limit access. The preferred means to allow emergency access is to provide a Knox box. This is a small, permanently mounted safe that holds building or gate keys for firefighters and first responders to retrieve in case of emergency. Knox boxes are master keyed for the local fire department, so that they can quickly enter without having to force entry or find individual keys held in deposit at the station. Please provide your Knox box info, gate code or key to the fire department to ensure timely access in case of an emergency.

Address Visibility: Nearly half (44%) of houses in the district do not have addresses that are readily visible from the street. If smoke and flames are visibly engulfing the house, it is readily identifiable. However, about two thirds of calls in the district are for medical emergencies. If someone is incapacitated inside the home, a delay due to the first responders driving up and down the street trying to identify your location could literally be a matter of life and death. Make sure your address is readily visible from both directions (with large, contrasting numbers) at the base of the driveway. The sign should be made out of non-flammable material on a nonflammable post. Optimally, the numbers should be 4 inches high and should also be reflective to aid location after dark or in heavy smoke. For remote houses, the address should be visible at every turnoff or fork in the road leading to the house. If multiple mailboxes are grouped together for a common drive, an address on a mailbox only is not sufficient for emergency response.

Above Ground Propane Tanks and Gas Lines: Keep vegetation and flammable materials at least 10 feet away from above ground propane tanks, and grass mowed. There should be no overhanging branches. Minimum distance away from the house depends on the size of the tank, and should be placed level with the home (refer to the building and planning web site for your county for more details). Propane tanks should be at the same elevation as the structure – if they are placed below, flames may burn uphill toward your home; if placed above, leaking propane (which is heavier than air) could impact your home when it flows downhill. Ideally, gas lines should be buried. Propane tanks are designed with a valve that should vent if the tank becomes overheated. This may produce a flame (like a pilot light, but several feet in the air). If a propane tank is exposed to extreme heat of a fire, or the valve is damaged, the tank may explode. Likewise, portable propane cylinders may explode if exposed to direct heat from fire. A gas BBQ grill with a tank in good condition should not pose a hazard if used properly, and can be stored near the house unless a fire is imminent. Any spare tanks should be stored at least 30 feet from the house.

Above Ground Electric Lines: Overhanging electric lines provide a danger to firefighters, and are a potential cause of fire from downed lines. Consider having electric lines buried on your property. Report any arcing and sparking of electric lines by calling 911. Keep well clear of any downed power lines as they may be live and cause serious injury or death. If you see tree limbs in power lines that you feel pose a danger, contact the electric company listed on the pole.

Water Supply: Lack of available water for firefighting is one of the major concerns in the unincorporated area of the district. It can take as much as 30,000+ gallons of water to extinguish a fully involved house fire.

A dedicated fire cistern is normally at least 1500 gallons, is kept full, and is not used for domestic water. It normally has a dry hydrant – a fire hose connection – see diagram below. If you have a dedicated fire cistern, please check the level and ensure it is full.



Many people have cisterns used for drinking, domestic water and livestock. If these are used by the fire department they will likely become contaminated. If you have a drinking water cistern of at least 1000 gallons that is accessible from outside the home (within 20 feet of driveway) and normally has at least 500 gallons of water in it that you would allow to be used only in case of emergency, please provide that information to the Fire Chief. If town hydrants do not service your home, consider adding a fire cistern of at least 1,800 gallons. The cisterns are usually made of pre-cast concrete, buried underground. Estimated cost is approximately one dollar per gallon. Discuss with neighbors the possibility of installing a neighborhood cistern of at least 10,000 gallons plus cost of installation. The Lyons FPD will investigate grant opportunities for community cisterns, however many grants require 50% matching funds be provided.

Lyons Fire Protection District Cistern List

Below is a list of all cisterns identified during the community assessment. Please verify the list and provide any corrections or additional information to the Lyons Fire Chief (823-6611).

Address	Street	Gallons	Dry Hydrant	Notes
635	Apple Valley Road	1800		
1535	Apple Valley Road	1800	Yes	
940	Blue Mountain	1500		Drinking Water
1100	Blue Mountain			Drinking Water
550	Blue Mountain Rd	1,500	No	Above ground
978	Blue Mountain Rd	2,400	Yes	
1960	Colard Lane		Yes	
520	Eagle Ridge Road		Yes	Fire Cistern
580	Eagle Ridge Road	1, 800	Yes	Fire Cistern
2650	Eagle Ridge Road	12,500		5 cisterns, 2,500 gal each, above ground, not always filled, pump station at garage across street
2715	Eagle Ridge Road		Yes	Drinking water
2801	Eagle Ridge Road	1,800	Yes	Fire Cistern
2820	Eagle Ridge Road	1,800	Yes	Fire Cistern

Address	Street	Gallons	Dry Hydrant	Notes
2874	Eagle Ridge Road		Yes	Fire Cistern
3220	Eagle Ridge Road	2,000	Yes	Fire Cistern
100	Elk Run			Pond
471	Flint Gulch Drive			
1250	Grey Mountain Drive	10,000		Needs plumbing for hose connection
497	Indian Mountain	1, 000		Drinking Water
701	Indian Mountain	2, 500	Yes	Fire Cistern
168	Jasper		Yes	
246	JJ Kelly Road	1, 800	Yes	
450	Lake Drive		Yes	Pond
87	Lone Tree Lane			Pond
1723	Longmont Dam Road	4,000	Yes	Fire Cistern
37	Longmont Dam Road			
1221	Longmont Dam Road	1, 800	Yes	
1225	Longmont Dam Road	2, 500		
1415	Longmont Dam Road	2, 500	Yes	Fire Cistern
1599	Longmont Dam Road	2, 500	Yes	Fire Cistern
15529 & 15468	Moss Rock Drive	2, 500		Shared drinking water cistern
1035	Open Range Road			Pond
100	Pinwheel Ranch Rd	7,000		6000 gal overflow tank/1000 gal drinking water
590	Pioneer	2,500		
11683	Pointe View	10,000	Yes	Fire Cistern
2484	Ponderosa Hill Road	15,000		Gravity 120 psi 70 gpm
2484	Ponderosa Hill Road	15,000		Gravity (untested)
75	Pyrite Way	1,800	No	
411	Quartz way	1,800	Yes	
651	Quartz Way	10,000	Yes	Community Fire Cistern
	Rabbit Mountain Open Space Parking	2,000	Yes	Fire Cistern, 2 ½ inch connection
6400	Rabbit Mountain Rd			
15600	Redstone Court	1,800		
	River Way	12,000	Yes	Community Fire Cistern
95	Rowell	1,100		
1553	Rowell		No	
1554	Rowell Drive		No	
2213	Rowell Drive			
711	Sandstone Drive			
911	Silver Sage	10,000	No	4 cisterns, 2500 gal each behind studio & garage, Drinking Water
31271	South St. Vrain Drive	1,800	Yes	
2195	Spring Gulch	2,400		Drinking Water
1612	Spring Gulch Drive	2,500		
587	Stage Coach Trail	34,000		Fire Station 2, Electric pump
1507	Stage Coach Trail	12,000	Yes	2.5" suction

Address	Street	Gallons	Dry Hydrant	Notes
923	Steamboat Valley Road	2,000	Yes	
1568	Steamboat Valley Road	2,400	Yes	
1121	Stone Canyon Road	1,800	Yes	
100	Thunder Road	1,000		Drinking Water
1016	Vision Way	10,000	Yes	Community Fire Cistern

Wild Fire Behavior

Detailed scientific models can be used to predict how severe a fire will become and in what direction and how fast it will spread. This is dynamic - on any given day the weather and fuel conditions in effect will produce different results. However, a general understanding of these factors can help homeowners assess their relative risk.

Listed here are some considerations for each of the wildland fire behavior variables.

Weather: the following conditions increase the probability of fire starting and spreading:

High temperature

High Wind

Low Humidity

Drought

Season – Typically late summer through fall (until significant snowfall) is the highest risk, but anytime there has been extended dry weather

Topography: the following conditions can cause a fire to be more dangerous:

Aspect -south or southwest facing slopes are drier, but north-facing slopes have greater fuel density

Position - higher on the slope is more dangerous because fire spreads faster up hill, by drying out and preheating the fuels before the flame front arrives.

Steep Slope – fire spreads faster up hill. The steeper the slope, the faster the fire moves. Slopes greater than 30% (17 degrees) are particularly dangerous. Houses should be set back at least 30 feet from the edge of a slope greater than 30 percent.

Features such as draws and saddles can cause the fire to behave unpredictably and pose a hazard to firefighters.

Chutes and gullies – create a chimney effect; funnel the fire and cause extreme rates of spread and spotting.

Fuel Characteristics:

Quantity: more fuel leads to more intense (hotter) fire

Continuity: spacing or fuel breaks, both vertical and horizontal, can limit spread

Size: smaller, lighter fuels dry out sooner and start to burn faster but larger, heavier fuels burn longer and hotter; light fuels such as grass spread quickly

Compactness: fuel that is lying on the ground and tightly compacted, such as a thick layer of dead needles, has less surface area exposed and restricted oxygen, so it is harder to start and maintain a fire, but extremely difficult to extinguish. A fire with a greater rate of spread can be expected from fuel that is loosely compacted. Think of building a campfire: it is easier to start a fire with fuel arranged with air spacing.

Moisture Content: fuels with low moisture content start to burn more quickly. Heavier fuels take longer to dry out following rain or snowfall.

Type: Class A – wood, paper, and grass can be extinguished with water. Class B - Oily fuels, gas, propane and those that produce vapors requires special extinguishing agents such as foam. Class C – electrical fires require the power to be turned off.

Defensible Space

Defensible space is the area around a structure where fuels and vegetation are treated, cleared or reduced to slow the spread of wildfire towards the structure. This also provides firefighters room to safely access and defend the structure from approaching fire. Creating an effective defensible space involves developing a series of management zones in which different techniques are used. As a mountain property owner, your first defense against wildfire is to create and maintain a defensible space around each building on your property.

Zone 1 - The Safety Zone: This area is where you will do the most modification and treatment. It consists of an area of 15 -30 feet around the structure, in which all flammable vegetation is removed. This 15 - 30 feet is measured from the outside edge of the home's eaves and any attached structures, such as decks. Within this zone, several specific treatments are recommended:

- Plant nothing within three to five feet of the structure, particularly if the building is sided with a flammable material. Opt for weed barrier covered with rock or gravel instead.
- Make sure there are no areas of continuous grass adjacent to plantings in this area and frequently prune plants in this zone to ensure vigorous but low growth. Keep grasses mowed to four to six inches.
- Remove dead branches, stems and leaves.
- Enclose or screen decks with metal screening and extend gravel coverage under the decks. Do not use the area under decks for storage of anything that will burn.
- Do not store firewood in this area, particularly in sheds built onto the structure.
- Keep foundations, decks, stairs, gutters and roofs clear of leaves, pine needles and debris.
- Remove all trees from this zone, or if you keep trees, consider them part of the structure and extend the distance of the defensible space accordingly. Isolate trees from each other, prune to at least 10 feet above ground, and remove branches within 10 feet of any chimney.
- Remove all 'ladder fuels' from beneath the trees. Ladder fuels are small shrubs, trees, limbs and other materials that allow a fire to climb on the tree crown of branches and foliage.

Zone 2 - The Transition Zone: This is an area of fuel reduction and a transitional area between Zones 1 and 3. The size of Zone 2 will vary depending on the slope of the ground where the structure is built. The defensible space should extend from a minimum of 75 feet from the structure (on flat ground) to 125 feet or more on sloped ground. Within this zone, the arrangement of vegetation (fuel) should be modified. This will help reduce the continuous fuel surrounding a structure and also enhance home safety and the aesthetics of the property.

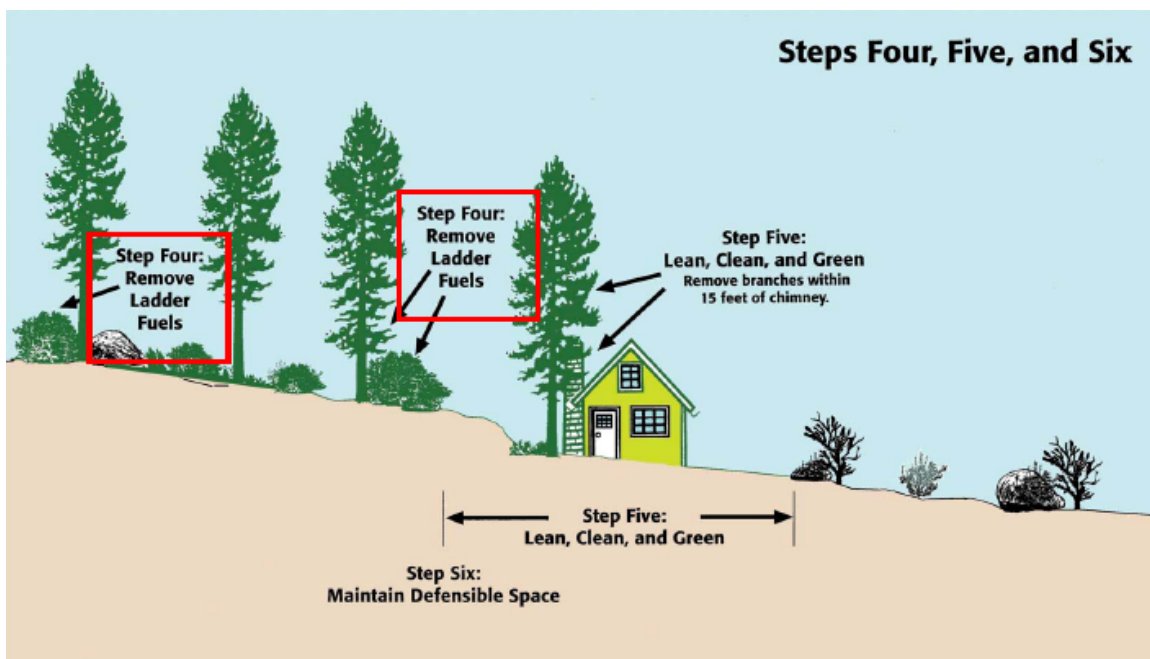
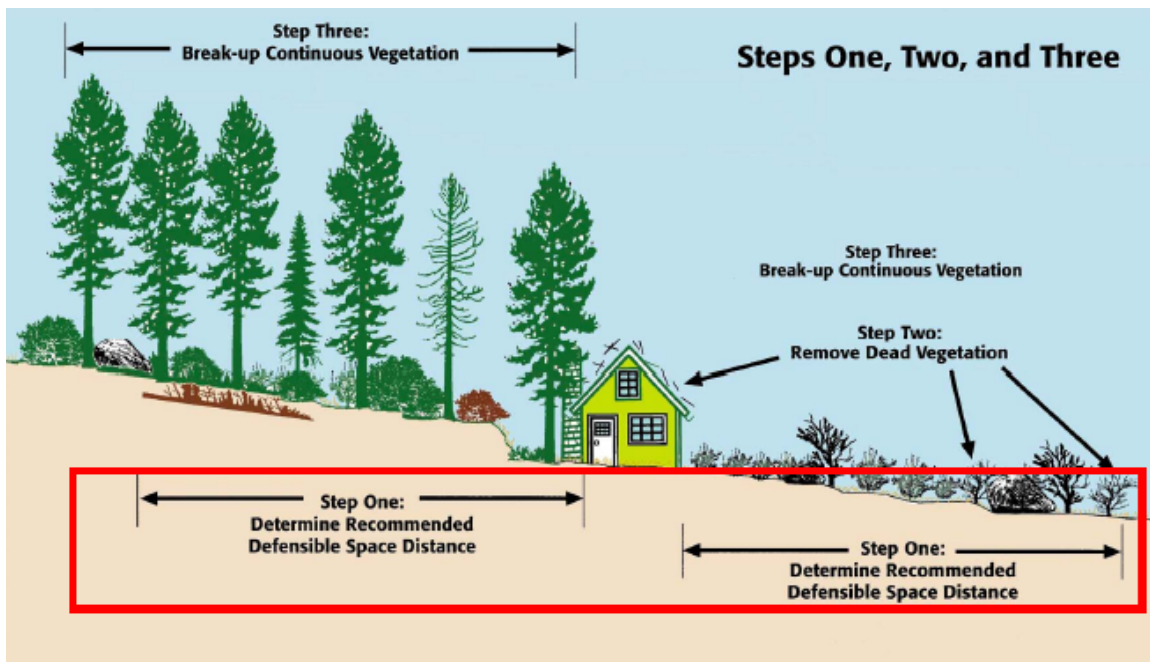
- Remove stressed, diseased, dead or dying trees and shrubs.
- Thin and prune the trees and large shrubs in this zone so that there is at least 10 feet of distance between the crowns.
- Thin along both sides of your driveway all the way to your main access road.
- Blend the treatment of Zones 1 and 3 by gradually decreasing the thinning of trees as you near the outer part of Zone 2.
- Mow or cut down grasses through the growing season to keep them no higher than six to eight inches. This is especially important in the fall when grasses dry out and after the spring thaw, when snow is gone, but before plants green-up.
- Stack firewood uphill or at the same elevation as the structure, but at least 30 feet away. Keep flammable vegetation at least 10 feet away from the firewood pile. Dispose of excessive slash and other dead vegetation by hauling away, chipping, or piling and burning. See discussion on fire restrictions and burn permits later.

Zone 3 - The Management Zone: This is an area of traditional forest management and is of no particular size. It extends from the edge of your defensible space to your property boundaries. In this area, you are encouraged to manage your forests in a more traditional manner. The actions you take will be determined by your objectives for your property. At minimum, you may want to:

- Remove trees that are diseased, insect-infested, and those of poor form or low vigor.
- Thin trees for forest health. Maintain age and species diversity.

These actions will sanitize and improve the health of the forest on your land. If you choose to do methodical thinning in Zone 3, contact the Boulder County Wildfire Mitigation Coordinator for specific guidelines and advice at (720) 564-2625, or the Colorado State Forest Service at 303-823-5774.

Steps to Creating Defensible Space



Fire Danger and Fire Restrictions: Rules and Terminology

You may be criminally charged or held financially liable if your willful or negligent actions result in a wildfire. You are responsible for understanding and complying with various fire condition terms and what restrictions are in place at any given time.

Seasonal Burn Restrictions or Burn Bans

In times of high fire danger, land managers (such as Forest Service, Park Service, and BLM) and political entities (cities, towns, and counties) may issue temporary burn restrictions or burn bans. These restrictions supercede normal rules that may be in place. The specific restrictions and what is allowed will vary by the issuing authority and should be checked carefully.

Meaning of the Current Fire Danger sign as you enter Lyons from the east:

Fire danger is the resulting description of the combination of both constant and variable factors which affect the ignition, spread, and difficulty of control of wildfires in an area. Fuels, weather, topography, and risks are key inputs into the model. The goal is to encourage the public to adapt their behavior and obey restrictions based on their knowledge of these levels.

IGNITION: A rating of the probability that a firebrand will cause a fire.

SPREAD: A rating of the forward rate of spread of the head of a fire.

SPOTTING: Behavior of a fire producing sparks or embers that are carried by the wind and which start new fires beyond the zone of direct ignition by the main fire.

CONTROL: The ability to construct effective control lines around a fire, any spot fires, and any interior islands to be saved; burned out any unburned area adjacent to the fire side of the control lines; and cool down all hot spots that are immediate threats to the control line, until the lines can reasonably be expected to hold under the foreseeable conditions.



Fire Danger Rating (Color Code)	Description
Low (Green)	Fuels do not ignite readily from small firebrands although a more intense heat source, such as lightning, may start fires in duff or dry wood. Fires in open cured grasslands may burn freely a few hours after rain, but timber fires spread slowly by creeping or smoldering, and burn in irregular fingers. There is little danger of spotting.
Moderate (Blue)	Fires can start from most accidental causes, but with the exception of lightning fires in some areas, the number of starts is generally low. Fires in open cured grasslands will burn briskly and spread rapidly on windy days. Timber fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel, especially draped fuel, may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.

High (Yellow)	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High-intensity burning may develop on slopes or in concentrations of fine fuels. Fires may become serious and their control difficult unless they are attacked successfully while small.
Very High (Orange)	Fires start easily from all causes and, immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high intensity characteristics such as long-distance spotting and fire whirlwinds when they burn into heavier fuels.
Extreme (Red)	Fires start quickly, spread furiously, and burn intensely. All fires are potentially serious. Development into high intensity burning will usually be faster and occur from smaller fires than in the very high fire danger class. Direct attack is rarely possible and may be dangerous except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions the only effective and safe control action is on the flanks until the weather changes or the fuel supply lessens.

Burn Bans and Burn restrictions are issued by the county, city or federal land management agency (BLM, USFS) during times of dangerous fire conditions. Generally, a burn ban prohibits open burning, but specific prohibitions can vary by jurisdiction and should be checked. Restrictions may apply to: open burning, burn permits, prescribed burns, campfires, fire pits, fireworks, charcoal grills, smoking, and work that produces sparks such as welding and chainsaw use.

RED FLAG Warning means that critical fire weather conditions are either occurring or imminent. Red Flag Warning is a forecast issued by the US Weather Service to inform area firefighting and land management agencies that conditions are ideal for wildland fire ignition and propagation. Red Flag Warnings may be issued after drought conditions, when humidity is very low, during storms with dry lightning, and especially during high or erratic wind conditions. Red Flag Warning is a critical statement for firefighting agencies, which often alter their staffing and equipment resources dramatically to accommodate the forecast risk. To the public, a Red Flag Warning means high fire danger with increased probability of a quickly spreading vegetation fire within 24 hours.

Fire Weather Watch is issued to alert fire and land management agencies to the possibility that Red Flag conditions may exist beyond the first forecast period (12 hours). The watch is issued generally 12 to 48 hours in advance of the expected conditions, but can be issued up to 72 hours in advance.

Burn Permits

Counties have strict regulations about when and how to conduct controlled burning. Regulations regarding what can be burned vary by season and county.

Boulder County:

Contact the Boulder County Public Health (BCPH) Air Quality Program to obtain a permit. Burns will not be allowed on red flag days. The following agencies must be notified for burning of a ditch, field, trash or slash:

1. Boulder County Public Health on the day of the burn (or on the following working day if the burn falls on the weekend).
2. Boulder County Sheriff Communications at (303) 441-4444, on the day of the burn (before and after the burn).
3. Your local fire department at least three days prior to burn.

Larimer County:

Most outdoor burning in Larimer County requires a permit signed by both your local fire department and the Larimer County Department of Health and Environment. The fire department evaluates applications for potential fire safety issues, while the health department evaluates air quality issues that can impact human health. Open burning without a permit is illegal and can result in fines of up to \$10,000 per day. The application process and safety guidelines are posted on the Larimer County website listed at the end of this section, or you may call 970-498-6775 for more information.

Burn Safety

Contact the Lyons Fire Protection District at 823-6611 before commencing your burn.

Pile debris in open areas away from standing timber and structures.

Piles should be no larger than 8 feet wide and 6 feet high.

There must be a minimum of 4-6 inches of snow cover around piles.

Winds should be less than 10 mph. Check the weather forecast to avoid burning during high winds or extremely dry conditions.

Always have water, a rake, and a shovel available.

Attend all fires until completely out.

All burning must be extinguished by nightfall.

COLORADO OPEN BURN FORECAST: For those with permits for Open Burning, check the web page listed at the end of this Appendix to find out if open burning is allowed that day:

Residential Burning in Colorado

Residential burning pertains to operating wood burning systems and appliances including stoves, fireplaces and heaters in a residence. During the winter high pollution season (November through March) if an air quality Action Day is currently in effect, residential burning is restricted in the seven-county Denver-metro area, including Denver, Boulder, Broomfield, Douglas, Jefferson, and areas west of Kiowa Creek in Adams and Arapahoe counties. The only exceptions to the residential burning restrictions are for people living above 7,000 feet; those who use Colorado Phase III (Phase II EPA) certified stoves, Colorado approved pellet stoves, approved masonry heaters or those whose stoves or fireplaces are their primary source of heat. Residents are also asked to voluntarily limit driving on Action Days.

On days that are not air quality Action Days, no restrictions are in place.

Outdoor Recreation Fire Safety

Be aware of fire risks and take responsibility for your use of fire.

- Before you leave home, check with authorities at your camping location for fire restrictions. During especially dry seasons, even recreational and cooking fires can be restricted.
- Be careful with campfires - only build fires in rings or grates. Avoid areas with overhanging branches, steep slopes and dry grasses.
- Maintain a safety zone around a campfire and always closely supervise children. Teach them to stop, drop and roll if their clothing catches on fire.
- Keep a bucket of water and shovel nearby to put out the fire. When extinguishing a campfire, drown it with water and stir with water and dirt until all the ashes are cold.
- Use self-contained cookers or chemical stoves instead of campfires for cooking.
- Keep hot mufflers and catalytic converters clear of grasses and shrubs.
- Think about how you would evacuate in the event of a wildfire. Plan the routes you could take, including at least one alternate route, in case your primary route is blocked.

Annual Fire Safety Checklist

This is an annual checklist. Don't wait until a fire is approaching to perform these tasks.

Thin trees and brush properly within the defensible space.

Remove trash and debris from the defensible space.

Remove any trees growing through the porch.

Clear roof and gutters of leaves and debris.

Remove branches overhanging chimney and roof.

Stack firewood uphill or on a contour at least 30 feet away from the home.

Place shutters, fire curtains or heavy drapes on windows.

Place screens on foundation and eave vents.

Enclose sides of stilt foundations and decks.

Use a chimney screen or spark arrester.

Clear vegetation around fire hydrants, cisterns, propane tanks, etc.

Make sure an outdoor water supply is available, with hose, nozzle and pump.

Make sure escape ladder and fire extinguishers are available.

Post address signs so that they are clearly visible from the street or road.

Make sure the driveway is wide enough for fire trucks and equipment.

Install and test smoke detectors. Inspect installed sprinkler system.

Practice a family fire drill and evacuation plan.

Create/update home inventory list with photos or videos and store offsite.

Consider signing up for cell phone, text or email emergency notification alerts (in addition to reverse 911, which is automatically sent to home phones).

Evacuation Checklist

If a wildfire is threatening your area, listen to your radio or local TV station for updated reports and evacuation information.

Confine pets to one room and make plans to take care of them in the event of evacuation.

Make plans for the evacuation of livestock. Arrange for transportation and a place to bring them to, or leave food and water if you are unable to move them.

Arrange for temporary housing with a friend or relative whose home is outside the threatened area. Leave a note in a prominent place in your home that says where and how you can be contacted. Notify an out of town contact where you will be.

If your home is threatened by wildfire, you will be contacted and advised by law enforcement officers to evacuate. If you are not contacted, or if you decide to stay and help defend your home, evacuate pets and any family members not needed to protect your home.

When evacuating, wear protective clothing: sturdy shoes, cotton or woolen clothing, long pants, a long-sleeved shirt, gloves, and a handkerchief to protect your face.

Choose a route away from the fire if possible. Watch for changes in the speed and direction of the fire and smoke.

What to Take: Customize this list. Consider having a pre-packed “GO” bag with most of these essential items stored near the vehicle, and make your own detailed list of where the other items are located.

Disaster supply kit, stored close to the vehicle, containing:

- Bottled drinking water
- At least one change of clothing and footwear for each member of the family
- Blanket or sleeping bag for each person
- First aid kit
- Emergency tools including a battery-powered radio, flashlight and extra batteries
- Extra set of car keys and credit cards, cash or traveler’s checks
- Toiletries and other special items for infants, elderly or disabled family members

Important documents (bank, tax, trust, investment, insurance policy, birth certificates, medical records)

Credit and ATM cards

Prescription Medications and Prescription eyeglasses

Driver’s license, Passport, Photo ID (ensure one document shows your name and current residence address (like utility bill or vehicle registration) for reentry

Computer backup files

Inventory of home contents

Photographs of the exterior of the house and landscape if there’s time

Address book, cell phone and charger

Family heirlooms, photo albums and videos

Pet Crate, food, bowls, and leash

Preparing Your Home for Approaching Fire

Whether you choose to stay to defend your home or to evacuate, complete as many of the following preparations as possible. Do not jeopardize your life. No material item is worth a life. You are strongly urged to evacuate as soon as you are advised to do so, or if you feel unsafe.

Wear fire-resistant clothing and protective gear.

Remove combustible materials from around structures.

Close or cover outside vents and shutters.

Position garden hoses so they reach the entire house. Have the hoses charged, with an adjustable nozzle, but turned off.

Place large, full water containers around the house. Soak burlap sacks, small rugs or large rags in the containers.

Place a (non-wood) ladder against the roof of the house on the opposite side of the approaching wildfire. Place a garden hose near the ladder, prepared as described previously.

Place portable pumps near available water supplies, such as pools, hot tubs, creeks, etc.

Close all windows and doors. Do not lock them.

Close all inside doors.

Turn on a light in each room and all outside lights. Leave them on even during daylight hours.

Fill tubs, sinks and any other containers with water.

Shut off the gas at the outside meter or the propane tank.

Remove drapes and curtains made from light material such as cotton, lace, or nylon. Close Venetian blinds, heavy drapes or fire-resistant window coverings.

Move overstuffed furniture and lightweight flammable materials into the center of the house, away from windows and sliding glass doors.

Extra vehicles you are unable to remove: Park in the garage, facing out. Close the windows but do not lock the doors. Leave the keys in the ignition or on the seat. Park any additional vehicles away from the buildings.

Close the garage door but leave it unlocked. Disconnect the automatic garage door opener.

Wildfire Mitigation

Wildfire Mitigation is the implementation of various measures designed to minimize the risk and destructive effects of a wildfire on your property. Some measures are designed to modify the forest environment and reduce the fuel load surrounding a structure or group of structures that puts the structures at risk from destruction by a wildfire.

Others focus on modifying the construction of a structure itself or changing its location to improve its ability to withstand a wildfire without being dependent upon fire suppression resources. These efforts principally apply to the construction or remodeling of a home, and are governed by local building codes.

We will focus on efforts to reduce the fuel load, which lessens the intensity of the fire. Another goal is to keep the fire on the ground. Once a crown fire develops, it is nearly impossible to stop without aircraft support.

Types of mitigation projects:

Clear-cut fuel break

Shaded fuel break

 Limb trees to a height of 10 ft or 1/3 the height of the tree

 Thin trees to provide 10 – 30 ft between crowns

 Remove ladder fuels such as brush under the branches of remaining trees

Lyons Fire Mitigation Team

Lyons Fire will conduct a free homeowners assessment and provide mitigation recommendations. (This does not provide sufficient documentation for the wildfire mitigation plan required to obtain a boulder county building permit.)

Lyons Fire has a wildfire mitigation team that will perform mitigation projects such as thinning, limbing, removal of hazard trees, and constructing fuel breaks. Contact 823-6611 to arrange for a cost estimate.

Disposal of Lumber and Slash from Fire Mitigation Projects

Logs, Post and Poles, and Dimensional Lumber:

During cutting operations of any kind, the main trunks of trees are delimbed and cut up into logs of various lengths. Logs cut into lengths of 8-feet & 3-inches; 10-feet & 3-inches; 12-feet & 3-inches; or 16-feet & 3-inches can be utilized at their highest value as dimensional lumber, posts, or poles. There is not a huge market for small diameter logs created by many projects, however, the longer the log length the more options there are for utilization.

Firewood:

One of the most common uses for tree trunks in Boulder and Larimer Counties is as firewood. Use as firewood, from a wildfire mitigation perspective, is an acceptable practice as long as there is a safe and effective way to burn the wood and there isn't more firewood than can be used within a few years. Logs are typically cut up into 8-inch to 12-inch pieces, split, and stacked on-site. A small pile (less than 1/4 of a cord) stacked near the house in the wintertime is acceptable as long as it

is to be used in the immediate future. The main piles must be kept a minimum of 30-feet away from the house and other structures. Firewood must not be stacked near live trees, propane tanks, cisterns, utility poles, wood fences, accessory structures, or other such improvements.

Stumps:

For purposes of wildfire mitigation, stumps can be left in the ground. For aesthetic reasons, it is usually preferable to CAREFULLY low-stump to a height of 4 inches or less. Extracted stumps are extremely difficult to deal with. They are often large, unwieldy, and have rocks and gravel embedded in them, making chipping impossible. Additionally, you cannot burn stumps in slash piles. At this time the best disposal option for stumps is to haul them away to a landfill.

Slash Disposal:

As you create defensible space or manage your forest to make it healthier you will quickly accumulate a lot of branches and tops of trees that are too small to be used as firewood or dimensional lumber. This material is collectively known as slash and it represents one of the biggest obstacles to any successful forest management or wildfire mitigation operation. Proper disposal of slash is important in reducing the overall fire hazard and in controlling insects and disease in your forest. Removing slash has the added benefit of improving site aesthetics, aids in the development of grasses and shrubs, and improves access for people and wildlife.

Four Common Methods of Slash Disposal:

1. Loading, Hauling and Disposal

As the name implies, with this option cut woody biomass is loaded into trucks, trailers, or dumpsters and hauled to a legal drop-off site or to a landfill. The amount of slash generated from most lots make loading and hauling an expensive option for most people. It often requires a dumpster or the use of a large truck and trailer.

Peak to Peak Wood is a five-county effort in Colorado's northern Front Range to create markets for products coming from our fire-threatened public and private forests in order to lower treatment costs. They operate biomass collection sites and work with Colorado Forest Products to provides uses for forest materials produced by mitigation efforts.

Boulder County Community Forestry Sort Yards

Community forestry collection sites are designed to accept mountain pine beetle infested slash and wood as well as non-infested material. Material includes wood that has been removed from private property for the purposes of fire mitigation efforts, mountain pine beetle mitigation, or general forest improvement efforts. The wood sited is sorted for burning, processing, or use. Boulder County has established two community sort yards to collect wood and slash from county residents. Only one site is open at a time from April to October. The location alternates one time each year between Allenspark and Nederland. There is no charge to drop off trees and slash from private lands. See the website listed at the end of this section for scheduled operating dates and times and information on the material that can be accepted.

Larimer County Wood Sort Yard

The Larimer County Woody Biomass Sort Yards, a partner of Peak to Peak Wood, take wood from forest management, fire mitigation, and mountain pine beetle mitigation projects of property owners in the areas. Check the websites listed at the end of this appendix for current locations and operating times.

2. Chipping

Chipping is an effective way of dealing with slash, provided that the amount of material is of small diameter and limited quantity. It is an expensive method, requiring heavy machinery, and is most practical on small, level sites with good access. Chipping is the preferred method of slash disposal for many forestry contractors and tree services that have the knowledge and ability to work with large powerful chipping machines and trucks. Individuals can also rent chippers and do the work themselves, but these machines are generally smaller and don't chip as large a diameter of material. A chipper typically reduces materials into chips approximately one inch square by one-quarter inch thick. These chips decompose on the ground, provided there is enough available moisture, and they represent a low fire hazard. They also serve as mulch to hold soil moisture and aid in plant development. Small quantities of chips have a pleasant appearance and allow easy movement through the area.

It is important when chipping to spread chips discontinuously over an area to keep them from accumulating to a depth of more than a few inches. Be careful not to pile chips too deeply; they can stifle grass and flower development and can create an easy place for a fire to start. Chips can be used as mulch in flower beds, but do not spread chips as mulch around the foundation of your home or under decks.

3. Lop and Scatter

This is the easiest and cheapest method of slash disposal, but is not practical in dense stands of trees where the effects of cutting and leaving materials on the ground increases wildfire hazard. It is most often used in open areas of mature trees with few smaller trees or undergrowth and poses little risk for wildland fire. It can be an effective method of returning nutrients to rocky areas with minimal topsoil. Lop and scatter involves cutting trees and branches into small pieces and scattering them widely over an area. In typical forestry operations, it is desirable to cut pieces small enough so all the slash is laying flat within 12 inches of the ground, where it breaks down more readily and it doesn't inhibit walking or maneuvering of equipment.

4. Building Slash Piles and Burning

Piling and burning is a way to eliminate a large amount of slash at moderate cost. This method is most practical for use in areas where access is limited, disturbance needs to be minimized, heavy machinery cannot maneuver (or is not allowed), or the cost of such mechanical operations is otherwise prohibitive. Generally, lots greater than one (1) acre in size can use this method effectively to dispose of slash. Forests should be low to moderately dense and have openings large enough to permit the piles to burn without starting nearby trees on fire.

Slash piles should be constructed to facilitate clean burning. There are weather and air quality restrictions for burning. Piles can be safely burned during times when snow cover is sufficient to prevent fire spread (generally, a minimum of 4 to 6 inch depth). Pile burning leaves a scorched fire ring that should be monitored to ensure noxious weeds don't colonize the disturbed area. Check with your county for specific pile dimensions and size of wood that can be burned.

Pile Burning requires a permit! It may take several months to more than a year for the fuels to cure and conditions to be appropriate to burn. There are currently several thousand piles along the Front Range waiting for appropriate conditions to allow burning. See the section on fire restrictions for information on how to obtain a burn permit in your county.

Mountain Pine Beetles and Ips Beetles

There is growing concern about mountain pine beetle infestation in the district. While not as severe a problem in the Lyons FPD at this time, compared to areas to the west such as Allenspark and Rocky Mountain National Park, scattered infestations of both Mountain Pine Beetle and ips beetles have been identified within the district. It is probably not unreasonable to expect the problem to increase.

Special care must be taken to treat or dispose of “hot” or infected trees. Once the tree is dead, the beetles have already flown and usual methods of disposal can be used.

Caution: Cutting any trees during the flying season may attract Ips beetles. Ips is a common group of bark beetles that infests pine trees.

Ips beetles rarely attack healthy trees. Most problems with ips occur to newly transplanted pines or when plants are under stress. Ips beetles also attack freshly cut logs and slash, broken branches and blown down trees. Several generations of ips can occur in a season (they fly repeatedly). Flying beetles actively seek new trees between April and October.

- Remove all freshly cut materials that result from pruning or thinning trees, as these attract ips beetles.
- Do not stack freshly cut or infested wood or slash next to living trees.

Step 1: Short-Term Management

- Identify the ponderosa, lodgepole, and limber pines on your property. These trees are most prone to beetle attacks.
- Consider protecting your high-value, non-infested but susceptible trees by applying a preventative spray. You may hire a contractor or contact a forester for approved chemicals.
- Timing is everything! Beetles fly between May and September. Preventative spraying should occur in the spring before the beetles start to fly.

Step 2: Treatment of Infested Trees

- Identification. Trees that have been successfully attacked first must be identified. Look for the following signs (contact a forester for assistance):
 - Popcorn-shaped masses of resin, called "pitch tubes," on the trunk where beetle tunneling begins. Pitch tubes may be brown, pink or white.
 - Boring dust in bark crevices and on the ground immediately adjacent to the tree base.
 - Presence of live MPB (eggs, larvae, pupae and/or adults) as well as galleries under bark. This is the most certain indicator of infestation.
 - Blue stained sapwood. Check at more than one point around the tree's circumference.
- After infested trees have been cut and limbed, the logs must be treated by one of the following methods:
 - Solar treatment: intense solar radiation can be used to kill larvae. This can be done with or without plastic and requires six to eight weeks of warm weather. Logs must be rolled periodically, and beetles have been known to chew through the plastic. For solar treatment without plastic,

score the bark lengthwise a few times for the full length of the log to allow better drying. Peeling the bark from the logs is also an option.

Burning, burying, chipping or removing infested logs. Haul logs to the air curtain burner, or to “safe sites” at least one mile from susceptible tree hosts. Infested logs may be burned in a fireplace or buried in the ground to kill larvae.

Step 3: Long-Term Management

A thinned, healthy forest will help prevent outbreaks of the mountain pine beetle, improve mountain views, and reduce wildfire hazard. By creating an environment that promotes healthy trees, you are providing the best defense against beetle attacks.

Bottom line on timing: If any cutting is done between April and October, caution is required to avoid further spread of beetles during their flying season (April – October for Ips and July-October for Mountain Pine Beetle). Hot (trees infected with live beetles) should be dealt with immediately, and caution should be taken with all slash to avoid attracting Ips beetles.

Wildfire Mitigation Grant and Funding Opportunities for Property Owners

Colorado Forest Agriculture Program: Landowners in Colorado are eligible to manage their forest and sell the timber products through the Forest Ag Program. The advantage of this program is that it offers a similar tax valuation as that of traditional agricultural lands.

Requirements for Eligibility:

- Own at least 40 forested acres
- Have a forest management plan that is prepared or endorsed by a professional forester that meets the CSFS Management Plan Outline for Forest Agriculture Classification standards
- Submit a completed and signed forest management plan, a completed Forest Agriculture Inspection Request form and the appropriate fee to the local CSFS district office by October 1 to be considered for the following tax year
- Manage land according to the approved Forest Management Plan and Annual Work Plan to produce tangible wood products for the primary purpose of obtaining a monetary profit

Contact the Colorado State Forest Service, 5625 Ute Highway, (303) 823-5774

Colorado State Income Tax Deduction for Wildfire Mitigation Expenses: For income tax years 2009 through 2013, individuals, estates and trusts may subtract from federal taxable income 50% of the costs incurred in performing wildfire mitigation measures that meet the following qualifications and limitations:

- The taxpayer must own the property upon which the wildfire mitigation measures are performed.
- The property upon which the wildfire mitigation measures are performed must be located in Colorado.
- The property upon which the wildfire mitigation measures are performed must be located in a wildland-urban interface area. (This includes the entire area covered by this CWPP).

- The wildfire mitigation measures must be authorized by a community wildfire protection plan adopted by a local government within the interface area.
- The total amount of the subtraction may not exceed \$2,500

See Colorado Department of Revenue Income Tax FYI #65.

Note: There is no minimum acreage for this deduction.

Boulder County Chipping/ Wood Transportation Reimbursement Program: Boulder County is offering financial assistance to encourage mountain communities to conduct community based chipping projects.

This program is being offered to help promote the utilization of locally produced wood products and also to help communities remove/chip highly flammable slash. Only chipping or biomass transportation costs will be reimbursed. Reimbursement is not available for tree cutting costs.

Ideal projects will provide a centralized location within the community to drop off biomass or else chipping and transportation services on a house-by-house basis.

Subject to prior approval, the County will reimburse up to 40% of direct costs up to a maximum of \$4,000 per community, or community organization. Please note that your project may not be eligible for the maximum funding if it serves less than 20 property owners.

NRCS Colorado Environmental Quality Incentive Program (EQIP): The purpose of the Environmental Quality Incentives Program (EQIP) is to provide a voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible national goals. EQIP offers financial and technical help to assist eligible participants install or implement structural and management practices on eligible agricultural land. Grants and incentives are available for agricultural producers, which includes trees on private, non-industrial forest land. A management plan and a contract with the NRCS are required. See the resources list for the website for further information.

Web sites for Homeowner education materials

(Note: websites sometimes move; if the link does not work try searching on the title)

Firewise information you can use: handouts, videos and interactive modules:

http://www.firewise.org/fw_youcanuse/index.htm

Colorado State Annual Wildfire Checklist and Evacuation Checklist

<http://www.ext.colostate.edu/pubs/natres/06304.pdf>

Colorado State Forest Service information to protect your home, property and forest from wildfire:

<http://csfs.colostate.edu/pages/wf-protection.html>

Boulder County Office of Emergency Management Disaster Preparedness Information:

<http://boulderoem.com/>

Northern Front Range Landowners Guide to Living with Bark Beetles

<http://www.bouldercounty.org/find/library/environment/fhhomeownersguide.pdf>

Larimer County Wildfire Safety Information:

<http://www.co.larimer.co.us/wildfire/>

Larimer County Burn Permit:

<http://www.larimer.org/burnpermit/>

Is Your Home Protected from Wildfire Disaster?

<http://www.firewise.org/resources/files/wildfr2.pdf>

National Wildfire Coordinating Group Publication Management System Wildfire Publications: (more advanced and technical information)

<http://www.nwcg.gov/pms/pubs/pubs.htm>

Driveway access for emergency vehicles, Boulder County:

<http://www.bouldercounty.org/find/library/environment/w04emervehiclesaccess.pdf>

Landowners Guide to Thinning, Colorado State Forest Service:

http://csfs.colostate.edu/pdfs/landowner_g4thin_scr.pdf

Chain Saw Safety, OSHA Fact Sheet:

http://www.osha.gov/OshDoc/data_Hurricane_Facts/chainsaws.pdf

Detailed techniques for cutting and limbing trees:

<http://www.ag.ndsu.edu/pubs/ageng/safety/ae1025w.htm>

Colorado Forest Agriculture Program

<http://csfs.colostate.edu/pages/forest-ag.html>

Colorado State Income Tax Deduction for Wildfire Mitigation, Colorado Department of Revenue FYI 65:

<http://www.colorado.gov/cs/Satellite?blobcol=urldata&blobheader=application%2Fpdf&blobkey=id&blobtable=MungoBlobs&blobwhere=1239428516897&ssbinary=true>

NRCS Colorado Environmental Quality Incentive Program (EQIP)

<http://www.co.nrcs.usda.gov/programs/eqip/eqip.html>

Mountain Pine Beetle, Colorado State Forest Service

<http://csfs.colostate.edu/pages/mountain-pine-beetle.html>

Ips Beetle, Colorado State Forest Service

<http://csfs.colostate.edu/pages/ips-beetle.html>

Boulder County Chipping/ Wood Transportation Reimbursement Program

<https://www.bouldercounty.org/live/environment/land/pages/chippingreimbursement.aspx>

Boulder County Propane Tank Location Requirements

<http://www.bouldercounty.org/find/library/environment/w13propanetanklocation.pdf>

Boulder County Brochure on Fire Cisterns and Emergency Water Supply for Fire Fighting

<https://www.bouldercounty.org/find/library/environment/w05emerwatersupply.pdf>

Boulder County Community Biomass Collection Sites and Air Curtain Burner Info

<http://www.bouldercounty.org/find/library/environment/curtainburner.pdf>

Boulder County Community Forestry Sort Yards

<http://www.bouldercounty.org/live/environment/land/pages/fhsortyards.aspx>

Peak to Peak Wood

<http://www.peaktopeakwood.org/>

Colorad Forest products

<http://coloradoforestproducts.org/>

COLORADO OPEN BURN FORECAST: For those with permits for Open Burning, check the following web page to find out if open burning is allowed that day:

http://www.colorado.gov/airquality/burn_forecast.aspx

APPENDIX D

NORTH ST VRAIN DETAILED COMMUNITY ASSESSMENT RESULTS

Overall Risk Assessment: **High**

Houses: 76

Description: This community stretches for approximately 3 miles along highway 36/North St Vrain and Longmont Dam Road. The North St Vrain Creek runs through the community. The neighborhood is bordered by Hall Ranch Boulder County Open Space to the south and east, and closed BC open space to the north. The western portion of neighborhood is surrounded by Forest Service lands and Button Rock Preserve. Public access to these areas increases the risk of human caused fire. Lower elevations along the creek are well watered with heavy deciduous vegetation, but areas in the western sections and higher elevations are much drier.

Average Lot Size: Ranges from less than 1 acre at east end to 160 acres at west end.

Access Ingress/Egress, Response Time: This neighborhood is at the western edge of the district. All areas are greater than 10 minutes from the fire station, and most of Longmont Dam Road is greater than 20 minutes. North St Vrain is a heavily traveled, paved 2 lane state highway with dangerous curves. Longmont Dam Road is a paved county-maintained road with grades greater than 5%. The left turn onto Longmont Dam Road is located at a very dangerous blind curve. Locked gates will slow access to some houses. Several houses are inaccessible by fire engines due to unrated bridges. Safe egress from Button Rock is a concern due to only one way out involving long distances along heavily wooded roads. Some houses do not have visible address markings.

Predominant Fuel Model: Lower elevations along the creek contain fuel model 9 and 10, with some dense deciduous vegetation. The western portion of the area contains some grass (fuel model 2), but mostly fuel models 8 and 9, with open and closed ponderosa forest. North aspect slopes have much denser vegetation. Significant mitigation has been done on the shores of the Longmont Reservoir.

Terrain/Topography: Steep. Average slope is 24%, and many areas have slopes greater than 40%.

Home Construction: Houses are primarily more than 20 years old, predominantly wood siding. Mostly asphalt shingles, 2 with wood shakes. Many have wood decks, open underneath. Above ground propane tanks are common.

Defensible Space: Much more work needs to be done. A few newer houses have good mitigation, but most houses need significant mitigation work in all zones. While some homeowners (including those in newer houses) have done a good job of mitigation, there are many that have done little or none, even in zone 1. This means firefighters would have a difficult time defending many homes from an advancing wildfire. The combination of this lack of defensible space, and flammable materials adjacent to the home, with a wood-sided house, should be taken as a matter of grave concern.

Water Supply: Available, but requires shuttling with tenders. No hydrants or pressurized sources. There are a few fire cisterns, several houses have creek access for possible drafting, and the Ralph Price and Longmont Reservoirs are available for drafting but are not in proximity to the houses and would require water shuttle operations.

Special Hazards: Several homes without engine access due to unsafe or unrated bridges.

Issues:

Potential entrapment for residents in Button Rock area.

Fire department access for locked gates.

Insufficient defensible space.

Recommendations:

Identify specific locations for drafting from North St Vrain Creek and reservoirs.

Homeowners improve defensible space and Firewise maintenance.

Check weight limits on bridges.

Homeowners ensure visible address markings.

Identify safety zone for Button Rock residents due to egress issues. Investigate alternate emergency egress route to west.

Owners with locked gates provide gate codes, or install Knox box.

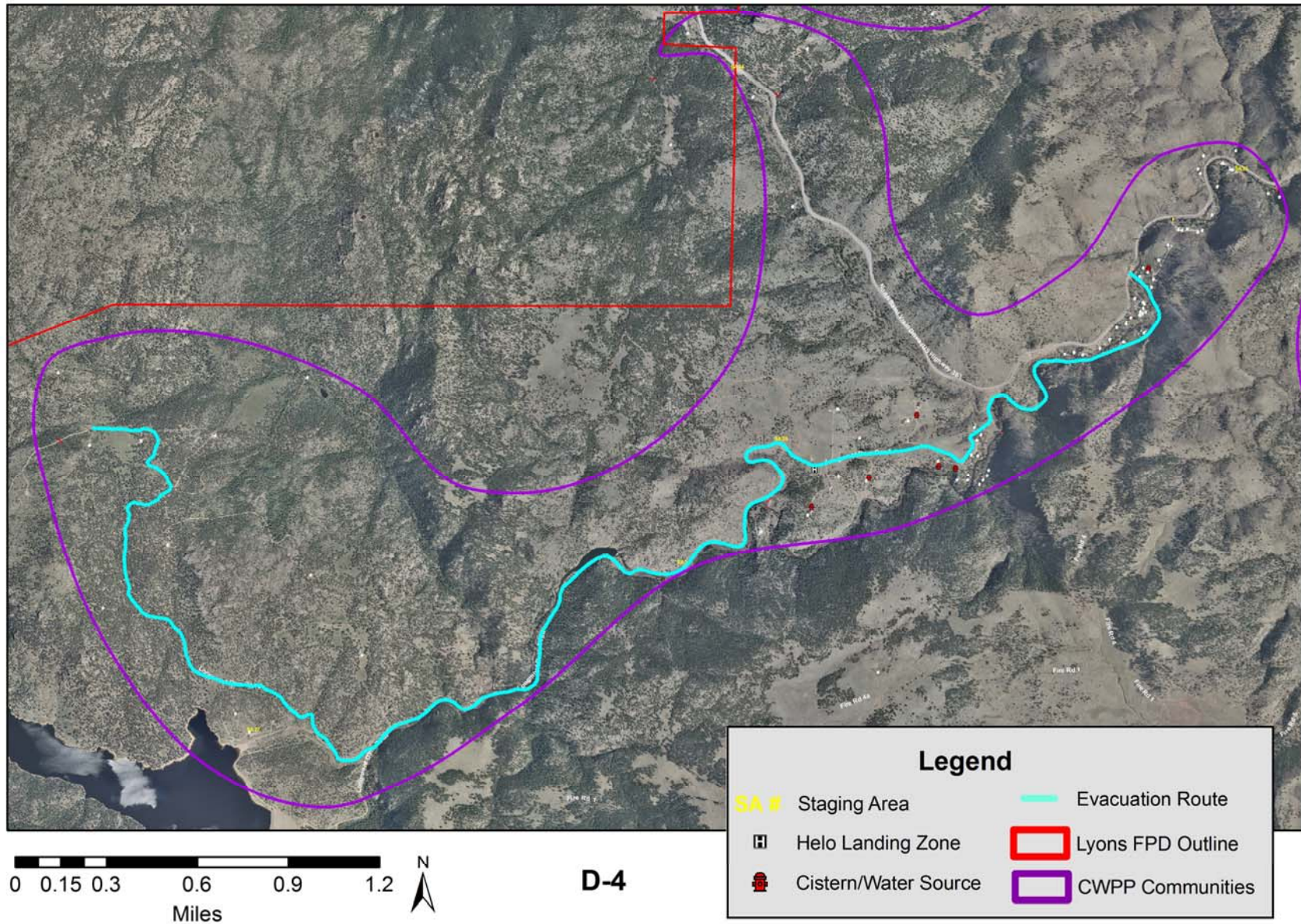
Mitigation on Longmont Dam Road required for egress west of Olsen Farm area.

Coordinate mitigation project for evacuation route on Longmont Dam Road inside Button Rock Preserve with ongoing City of Longmont watershed mitigation work and proposed USFS mitigation project.

Wildfire Risk and Hazard Severity Assessment		
Neighborhood: North St Vrain		
Neighborhood Rating: High		
Number of Houses: 76		
Means of Access to Neighborhood		
Fire Department Response Time	Greater than 20 minutes	9
Ingress and Egress	One Road In and Out	7
Road Width	Most > 24 Feet	2
Road Condition	Not Paved, Graded, County Maintained, some >5%	5
Fire Service Access	> 300 feet with Insufficient Pullouts	2
Street Signs	No Problems	0
Vegetation Along Access Route	Some Areas Require Mitigation	5
Other Access Hazards	Electric Wires Cross Above Road, Very Dangerous Turn onto Longmont Dam Road	2
Below Items were evaluated for each house, then averaged for the neighborhood:		
Vegetation (Fire Behavior Fuel Models)		
Fuel Models mostly 8 & 9, 10 along creek	Areas of Heavy Deciduous, some grass, much ponderosa open and closed crown	12.3
Defensible Space Mitigation		
Zone 1: within 30 ft	Partial mitigation	9.5
Zone 2: 30 – 100 ft	Minimal mitigation	4.6
Zone 3: beyond 100 ft	Minimal mitigation	2.3
Topography		
Slope	Average 24%	5.3
Building Setback	Some less than 30 feet from slope > 30%	1.5
Hazardous Topography	Steep slopes	1.4
Firefighter Access		
Address Visible	Most Non-reflective but otherwise visible	1.6
Driveway Length	Most < 100 feet, several > 300 feet	2.4
Turnaround for Engine	Most OK or N/A	0.8
Driveway Clearance for Engine	Most OK or N/A	0.6
Building Construction		
Roofing Material	Predominantly Asphalt, 2 with wood shakes	0.7
Siding	Predominantly Wood	7.2
Decks	Many wood deck, some composite, mostly open	3.9
Combustibles within 30 feet	Most OK but several problem areas	3.7
Firefighting Water Availability		
Cisterns	Insufficient cisterns but river access possible	7.8
Utility Hazards		
Aboveground Gas or Propane	Propane tanks common	1.3
Aboveground Electric Wires	Only a few in vicinity of houses	1.3
Neighborhood Total		100.2

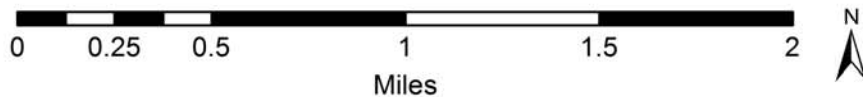
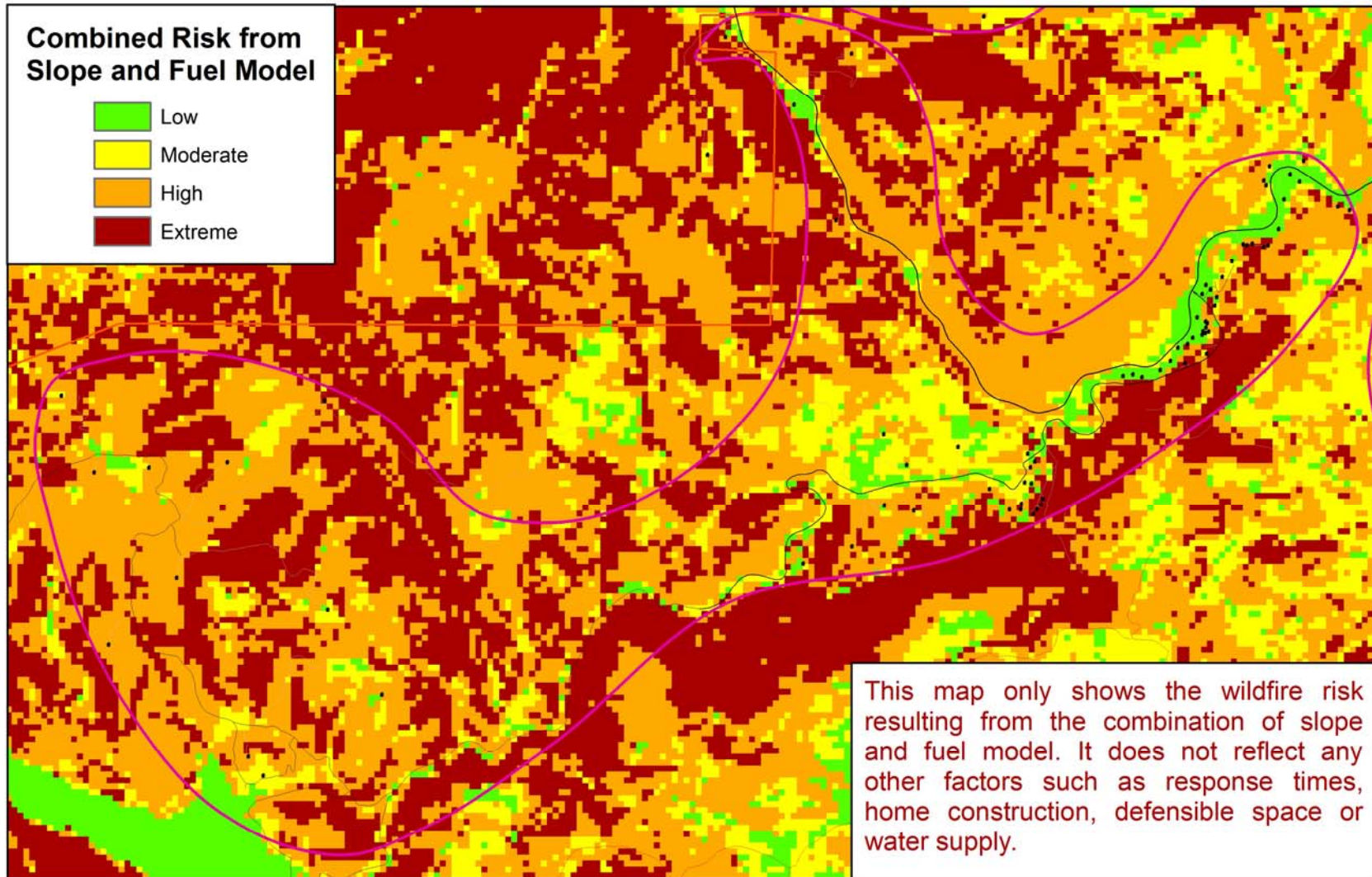
CWPP Community: North St Vrain

Wildfire Risk: High



CWPP Community: North St Vrain

Wildfire Risk: High



D-5

APPENDIX E

LYONS PARK ESTATES DETAILED COMMUNITY ASSESSMENT RESULTS

Overall Risk Assessment: **High**

Houses: 65

Description: Lyons Park Estates is located on the foothills south of the town of Lyons on a north- and east-facing slope. The neighborhood is bordered on the south and east by Heil Valley Ranch, Boulder County Open Space. The recently opened Picture Rock Trail has increased use of the area, along with the potential for human caused fire. The neighborhood is bordered on the north by agricultural land and on the west by the former Aggregate Industries quarry site.

Average Lot Size: Approximately 5 Acres. However, the topography concentrates the houses, resulting in this being the 3rd most densely populated area in the district outside the Town of Lyons.

Access Ingress/Egress, Response Time: Single ingress/egress is provided on a mix of county-maintained, well graded gravel roads greater than 24 ft wide, and privately maintained steep and winding gravel roads less than 20 feet wide. There are turn-arounds at each cul-de-sac. Due to circuitous routes, Fire Department response time is 5-10 minutes (2 miles) to the entrance at the north edge of the development on paved side roads, but more than 20 minutes to the furthest houses at the top of Sandstone Drive. All roads have thick vegetation to the road edge. Only alternate egress is along a poorly maintained, nearly impassable fire road into Heil Ranch Open Space.

Predominant Fuel Model: Predominant fuel models are 8 and 9, consisting of open and closed stands of ponderosa pine, predominantly not limbed except in the vicinity of houses. There are occasional meadows with grass fuel model 2, and Red Gulch Road is Agricultural.

Terrain/Topography: The terrain is very steep. While the average slope is 28%, there are many steep, heavily wooded areas where the slope is greater than 40%. Many houses are set high on the slope with insufficient setback. The gulch along Flint Gulch road presents a hazard to the access/evacuation route, with the likelihood that a fire there could cut off access to Sandstone Drive. Predominant aspects are north and east, resulting in fairly dense vegetation.

Home Construction: Houses were constructed over a period of about 35 years, from the mid-1970s to present. Average age is about 20 years old. Older houses are predominantly wood-sided with asphalt roofs. A few newer homes were built during the 2000's to newer codes with non-combustible siding and non-combustible decks. A few homes have wood shake roofs. Propane tanks are common. Above ground propane tanks are common.

Defensible Space: Needs significant improvement. While some homeowners (including those in newer houses) have done a good job of mitigation, there are many that have done little or none, even in zone 1. This means firefighters would have a difficult time defending many homes from an advancing wildfire. The combination of this lack of defensible space, and flammable materials adjacent to the home, with a wood-sided house, should be taken as a matter of grave concern.

Zone 3 is largely untouched throughout the neighborhood. Several vacant lots are also untouched. This provides large patches of fuel model 9 on steep slopes, which increases the potential for fire spread.

Water Supply: Insufficient. There is a 10,000-gallon community cistern at the top of Quartz Way, and only 5 private cisterns of 1800 gallons. The community cistern is not optimally located. Depending on the location of a fire, it may not be accessible at all. Some homeowners have drinking water cisterns that may provide some limited additional capacity. There is limited room to set up water supply operations, with long transit times from the nearest hydrant at in the town of Lyons.

Special Hazards: Although electrical lines are buried to most properties, overhead electrical lines cross over the road repeatedly, presenting a potential ingress/egress hazard.

Issues:

Insufficient water supply.

Ingress/egress concerns due to vegetation along all roads.

Inadequate defensible space around residences.

Need Safety Zone.

Recommendations:

Homeowners need to improve mitigation for defensible space, especially zone 1 and 2 and those with wood sided houses.

Additional cisterns needed.

Mitigation for ingress/egress along all roads.

Boulder County Parks and Open Space prioritize a mitigation project for a fuel break in Heil Valley Ranch south of Lyons Park Estates.

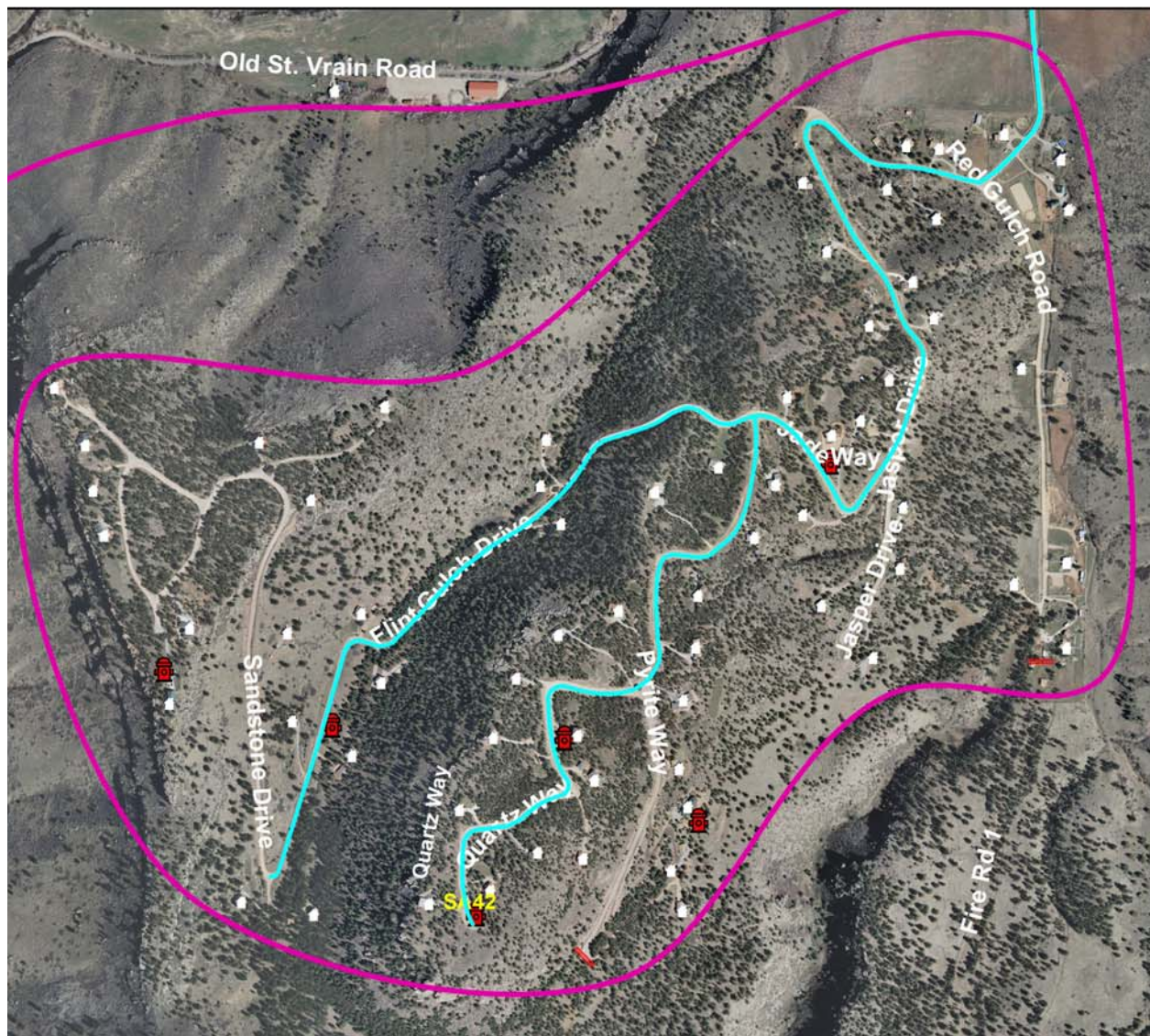
Replace missing street signs, place at all intersections.

Identify safety zone.

Homeowners ensure visible address signs.

Investigate alternate emergency evacuation route through Heil Valley Ranch on Fire Road 1a through the Pyrite Access Gate (requires mitigation and road work).

Wildfire Risk and Hazard Severity Assessment		
Neighborhood: Lyons Park Estates		
Neighborhood Rating: High		
Number of Houses: 65		
Means of Access to Neighborhood		
Fire Department Response Time	10-20 Minutes	6
Ingress and Egress	One Road In and Out	7
Road Width	20-24 and > 24 Feet	2
Road Condition	Not Paved, Graded, some County Maintained, >5%	5
Fire Service Access	> 300 feet with Turnaround and Pullouts	2
Street Signs	1 Missing, Confusing Layout	2
Vegetation Along Access Route	Several Areas Require Mitigation	7
Other Access Hazards	Electric Wires Repeatedly Cross Above Road	2
Below Items were evaluated for each house, then averaged for the neighborhood:		
Vegetation (Fire Behavior Fuel Models)		
Fuel Models 8 & 9	Predominantly ponderosa open or closed crown, minimal slash	12.2
Defensible Space Mitigation		
Zone 1: within 30 ft	Some mitigation	9.4
Zone 2: 30 – 100 ft	Some mitigation	4.2
Zone 3: beyond 100 ft	Minimal mitigation	2.1
Topography		
Slope	Average 28%	7
Building Setback	Many not at least 30 feet from slope > 30%	3.2
Hazardous Topography	Steep Slopes and Chimney (Gulch)	1.3
Firefighter Access		
Address Visible	Most Non-reflective but otherwise visible	1.4
Driveway Length	Most < 100 feet, several > 300 feet	1.6
Turnaround for Engine	Most OK or N/A	0.9
Driveway Clearance for Engine	Most OK or N/A	0.1
Building Construction		
Roofing Material	Predominantly Asphalt, 3 with wood shakes	1.2
Siding	Predominantly Wood	6.3
Decks	Many wood deck, some composite, mostly open	3
Combustibles within 30 feet	Most OK but several problem areas	2
Firefighting Water Availability		
Cisterns	Severely Insufficient, only 19,000 gallons total, Community Cistern Poorly Located	8.2
Utility Hazards		
Aboveground Gas or Propane	Propane tanks common	1.7
Aboveground Electric Wires	Only a few in vicinity of houses	0.3
Neighborhood Total		99.1



CWPP Community: Lyons Park Estates

Wildfire Risk:
High

Legend

-  Evacuation Route
-  SA # Staging Area
-  Helo Landing Zone
-  Cistern/Water Source
-  CWPP Communities
-  Lyons FPD Outline

0 0.0450.09 0.18 0.27 0.36
Miles

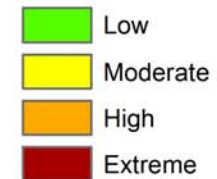


E-4

CWPP Community: Lyons Park Estates

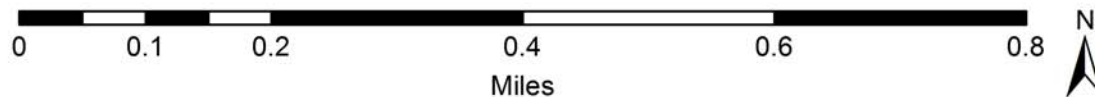
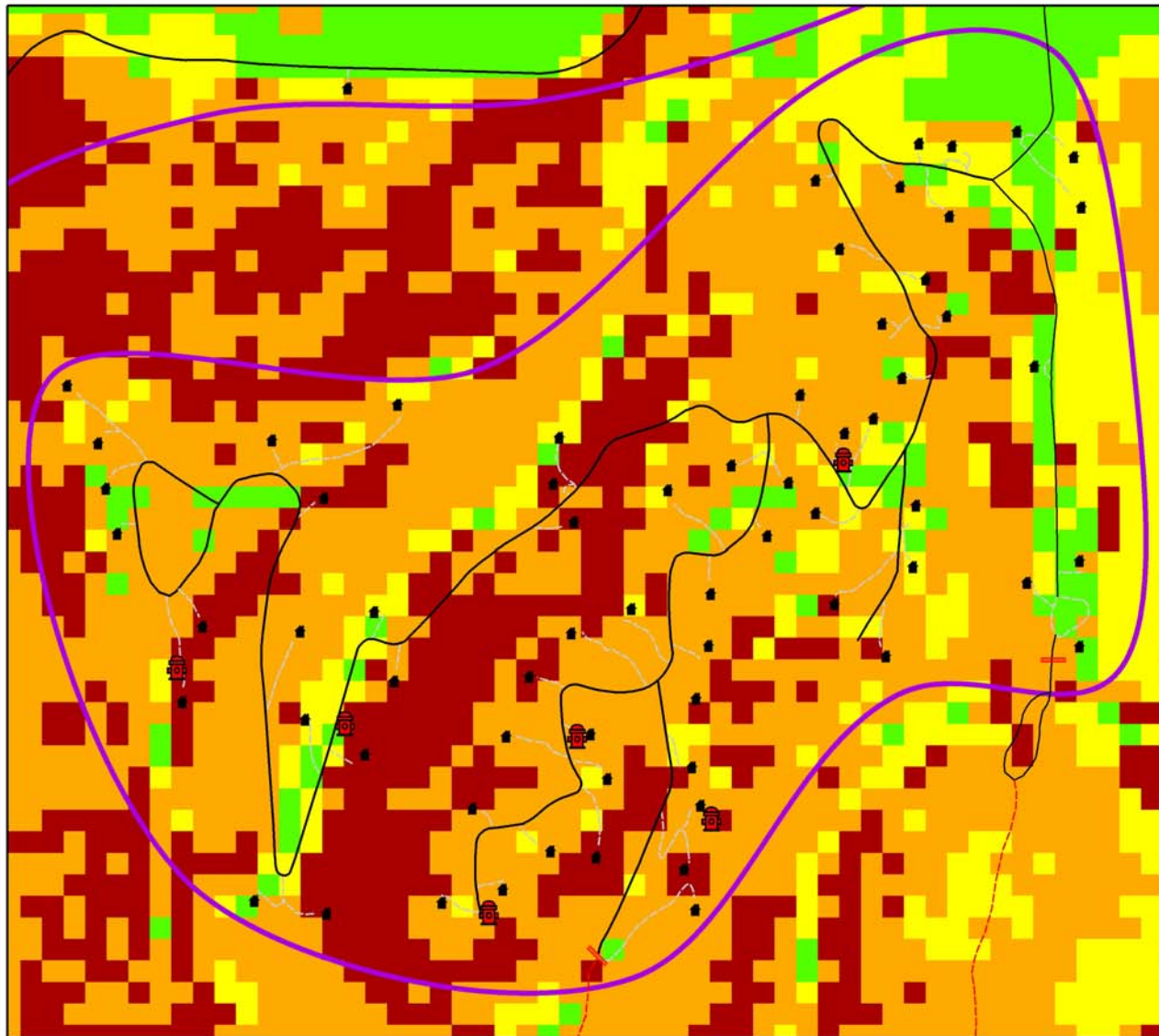
Wildfire Risk:
High

Combined Risk from Slope and Fuel Model



This map only shows the wildfire risk resulting from the combination of slope and fuel model. It does not reflect any other factors such as response times, home construction, defensible space or water supply.

E-5



APPENDIX F

SPRING GULCH

DETAILED COMMUNITY ASSESSMENT RESULTS

Overall Risk Assessment: **High**

Houses: 130

Description: The community is located along and to the west of Blue Mountain Road in northern Boulder County/Larimer County Road 37E in southern Larimer County. While this road is paved and located in a wide grassy valley, the remainder of the community is located among a network privately maintained dirt roads winding through foothills characterized by heavy trees and outcroppings of boulders. The neighborhood is nearly surrounded by public land, bordered on the west by Forest Service Lands; on the south by Boulder County “closed” open space; on the north by X-Bar 7 community; and on the east by Steamboat Mountain, also boulder county open space.

Average Lot Size: 15 acres

Access Ingress/Egress, Response Time: While most houses have access from two directions, the entire community is accessed from Highway 36 by a single entry point, Blue Mountain Road, at a dangerous intersection with no traffic light and short sight lines, which requires traffic coordination for any major event. Aside from Blue Mountain Road/LCR 37E, which is paved, the remainder of the roads are graded dirt, privately maintained, steep and winding. Several roads have no turnarounds or pullouts. Fire department response time for Blue Mountain Road is less than 10 minutes from station 1 or 2, but greater than 20 minutes for most of the neighborhood. Street signs are not standard and constructed of flammable material. Some road intersections are not labeled and many are ambiguous. Many house numbers are not readily visible, potentially slowing response times further.

Predominant Fuel Model: Grass (fuel model 2) with areas of brush (fuel model 6) along Blue Mountain Road/LCR 37E. Fairly dense open and closed –crown ponderosa (fuel models 8 and 9), with some areas of slash (10) and some brush (5).

Terrain/Topography: Hilly, with some steep sections and gulleys.

Home Construction: A few with wood shakes, most with wood siding, many wood decks. The age of the homes varies from new to 40 years old. Above ground propane tanks are common.

Defensible Space: While some homeowners (including those in newer houses) have done a good job of mitigation, there are many that have done little or no mitigation, even in zone 1. This means firefighters would have a difficult time defending many homes from an advancing wildfire. The combination of this lack of defensible space, and flammable materials adjacent to the home, with a wood-sided house, should be taken as a matter of grave concern.

Water Supply: Severely insufficient. No hydrants or pressurized water sources. Six fire cisterns have been identified (some of these are for drinking water and may not be full). It is a lengthy round trip to the nearest water supply at the hydrant at corner of Apple Valley Road, or the 30,000

gallon cistern at Station 2, either of which requires shuttling of tenders, and there is limited room to set up water supply operations such as ponds.

Special Hazards: Some roads and several long driveways have insufficient turnarounds and pullouts, precluding access by fire engines.

Issues:

Ambiguous and missing street and address markings.

Lack of defensible space.

Ingress/egress concerns due to vegetation along all roads and possible entrapment

Insufficient water supply.

Fire department access for locked gates.

Recommendations:

Improve water supply with additional cisterns. Consider extending hydrant line up Blue Mountain road with adjacent staging area.

Homeowners need to improve defensible space and Firewise maintenance.

US Forest Service and Boulder County create fuel breaks on south and west sides of the community.

Mitigation projects needed along beginning of Blue Mount road (access route) and both sides of all interior roads, particularly Colard Land and Spring Gulch Drive, which are the major evacuation routes.

Install Knox boxes for gates.

Homeowners post visible address signs.

Turnarounds or pullouts required on Valley View, Ridge View, Lone Tree, and Pioneer roads.

Identify a safety zone within the community in case evacuation is not possible.

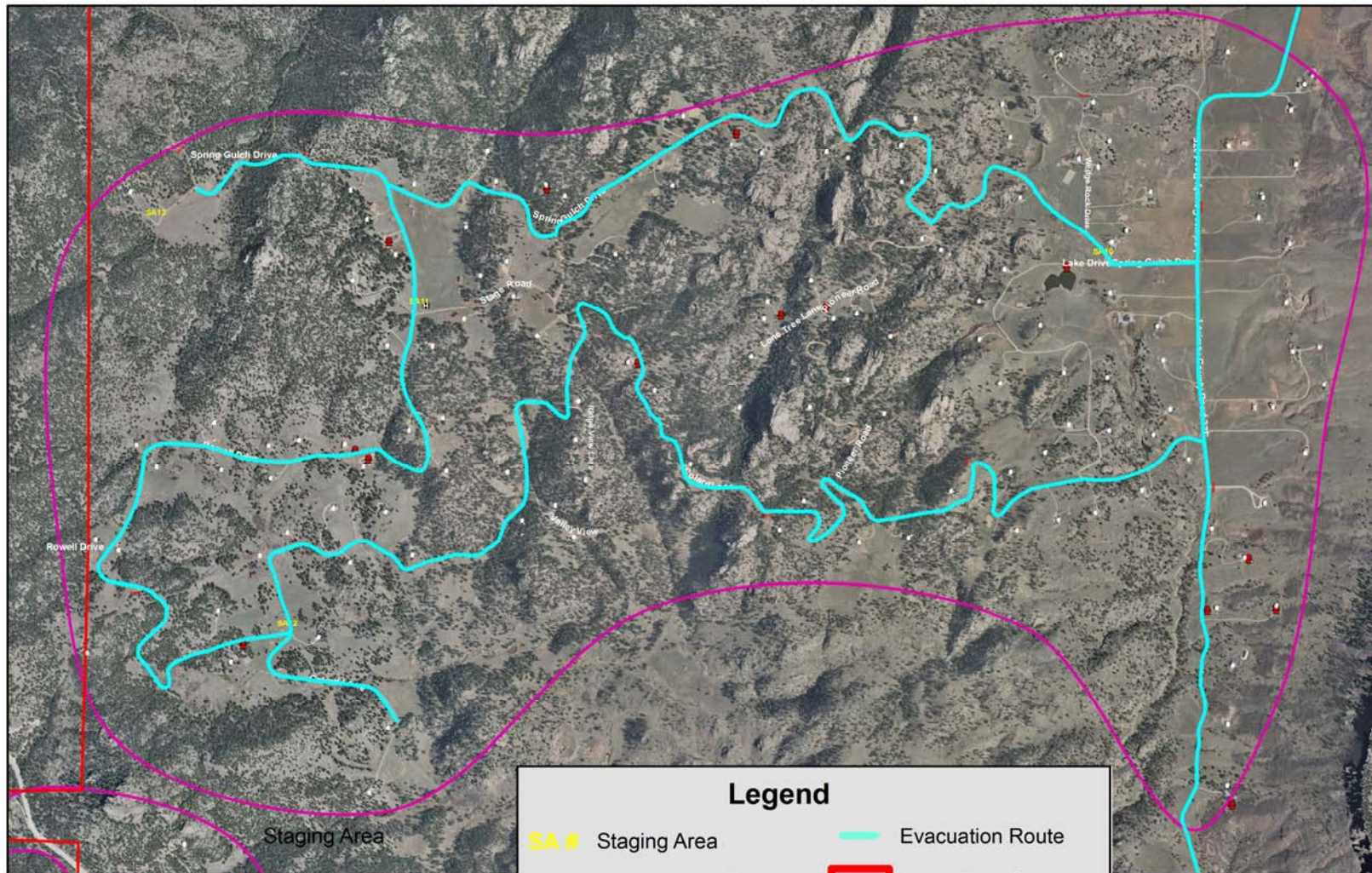
Replace missing street signs. Provide standardized street signs made out of nonflammable materials.

Investigate alternate emergency egress routes to the south and west.

Wildfire Risk and Hazard Severity Assessment		
Neighborhood: Spring Gulch		
Neighborhood Rating: High		
Number of Houses: 130		
Means of Access to Neighborhood		
Fire Department Response Time	> 20 minutes	9
Ingress and Egress	Two or more roads in and out within area, only one out of entire neighborhood to main highway	5
Road Width	20-24 feet	2
Road Condition	Not Paved, Graded, Privately Maintained, >5%	5
Fire Service Access	> 300 feet with insufficient Turnaround and Pullouts	2
Street Signs	1 Missing, Ambiguous Layout, nonstandard signs	3
Vegetation Along Access Route	Several Areas Require Mitigation	5
Other Access Hazards		0
Below Items were evaluated for each house, then averaged for the neighborhood:		
Vegetation (Fire Behavior Fuel Models)		
Fuel Models 5, 8 & 9	Native brush, ponderosa open or closed crown,	11.4
Defensible Space Mitigation		
Zone 1: within 30 ft	Many require mitigation	8.7
Zone 2: 30 – 100 ft	Most require mitigation	3.7
Zone 3: beyond 100 ft	Minimal mitigation	1.9
Topography		
Slope	Average 16%	4.3
Building Setback	Many not at least 30 feet from slope > 30%	2.1
Hazardous Topography	Steep Slopes and chimneys	1.3
Firefighter Access		
Address Visible	Many not visible	1.8
Driveway Length	Many > 300 feet	2.0
Turnaround for Engine	Many insufficient	0.8
Driveway Clearance for Engine	Most OK	0.1
Building Construction		
Roofing Material	Predominantly Asphalt, 4 with wood shakes	0.8
Siding	Predominantly Wood	6.5
Decks	Many wood decks, mostly open	3.6
Combustibles within 30 feet	Many problem areas	2.4
Firefighting Water Availability		
Cisterns	Severely Insufficient, 6 Cisterns Identified	9.8
Utility Hazards		
Aboveground Gas or Propane	More than half have above ground propane tanks	1.7
Aboveground Electric Wires	Only a few in vicinity of houses	0.4
Neighborhood Total		94.3

CWPP Community: Spring Gulch

Wildfire Risk: High



0 0.125 0.25 0.5 0.75 1
Miles

Legend

- | | | | |
|------|----------------------|--|-------------------|
| SA # | Staging Area | | Evacuation Route |
| | Helo Landing Zone | | Lyons FPD Outline |
| | Cistern/Water Source | | CWPP Communities |



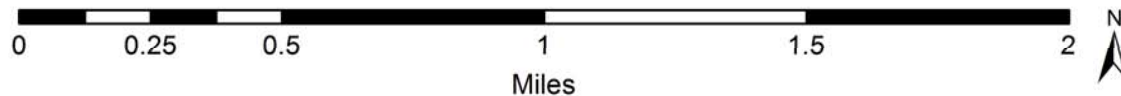
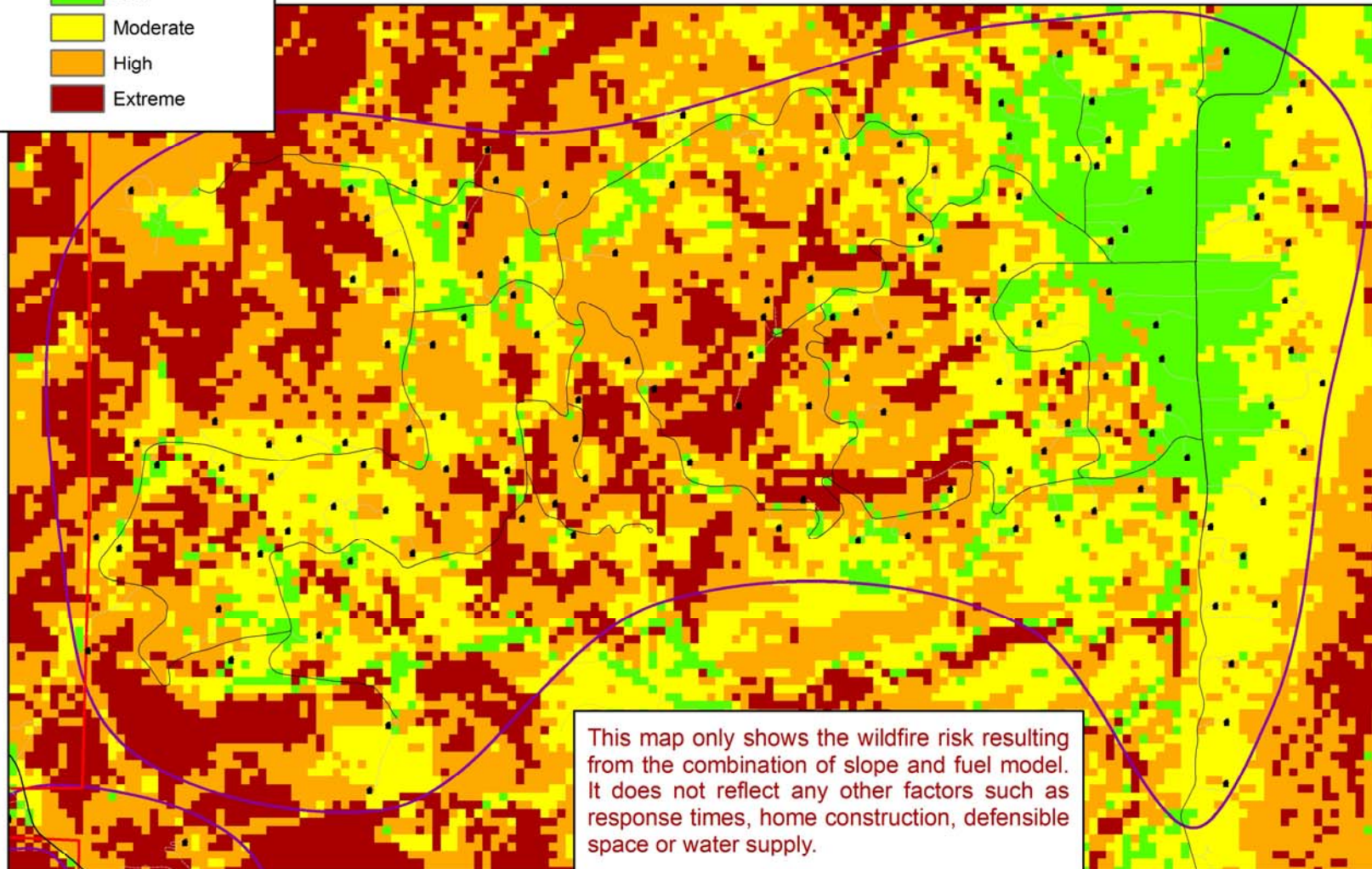
F-4

CWPP Community: Spring Gulch

Wildfire Risk: High

Combined Risk from
Slope and Fuel Model

- Low
- Moderate
- High
- Extreme



F-5

APPENDIX G

DAKOTA RIDGE DETAILED COMMUNITY ASSESSMENT RESULTS

Overall Risk Assessment: **High**

Houses: 34

Description: Dakota Ridge is located at the northeast corner of the Lyons FPD, and part of the neighborhood is in the Berthoud FPD. The area is in a remote section of foothills, bounded on the east by Rabbit Mountain Boulder County Open Space, and on the west by closed BC open space and a small parcel of federal land on Indian Mountain. To the north is uninhabited land in Larimer County. All accessible residences were surveyed.

Average Lot Size: Most are 35 acres or more

Access Ingress/Egress, Response Time: Only one way in and out. The only access is via N 53rd St, a paved, county-maintained road. Within the community, the roads are graded dirt, privately maintained, and some are very narrow and steep. There are no pullouts, so two-way traffic is very hazardous. Three Districts provide fire response: Lyons, Berthoud, and Hygiene (mutual aid). Response time is greater than 20 minutes from all three districts. Locked gates on several roads and driveways further slow access. Some road signs are pointed ambiguously.

Predominant Fuel Model: Grass (fuel model 2), brush (fuel model 4 and 6), and a few areas of Ponderosa open crown (fuel model 8). In some areas the brush is quite heavy.

Terrain/Topography: Foothills, average slope is 12%, with some steep areas and chutes.

Home Construction: Varies with the age of the dwelling. There is one shake roof. Older homes tend to be wood sided, while a few newer homes are built to more modern codes with firewise construction methods. There are many wood decks. Above ground propane tanks are common.

Defensible Space: A few homeowners, particularly the newer homes, have done adequate mitigation in zone 1, but most need more work. Zones 2 and 3 are generally partial.

Water Supply: Virtually nonexistent. Only one dedicated fire cistern was identified. There is a 5000 gallon cistern at Rabbit Mountain. The nearest water supply is from hydrants on Ute Highway, a 16 mile round trip for water supply operations.

Special Hazards: Remote location. Many homes and two roads have locked gates.

Issues:

Lack of water.

Locked gates on roads and driveways.

Narrow roads with insufficient pullouts and heavy brush encroaching on roadway.

Recommendations:

Install Knox boxes for gates.

Install a hydrant at the intersection of Ute Highway and North 53rd Street in the vicinity of the water supply tank for tender fill.

Install one or more large community cisterns.

Widen roads or install pullouts.

Mitigate brush alongside roads for egress routes, particularly Indian Mountain Road, Moss Rock Court, Redstone Court and Thunder Road.

Improve road sign placement to clearly show road alignment at corners.

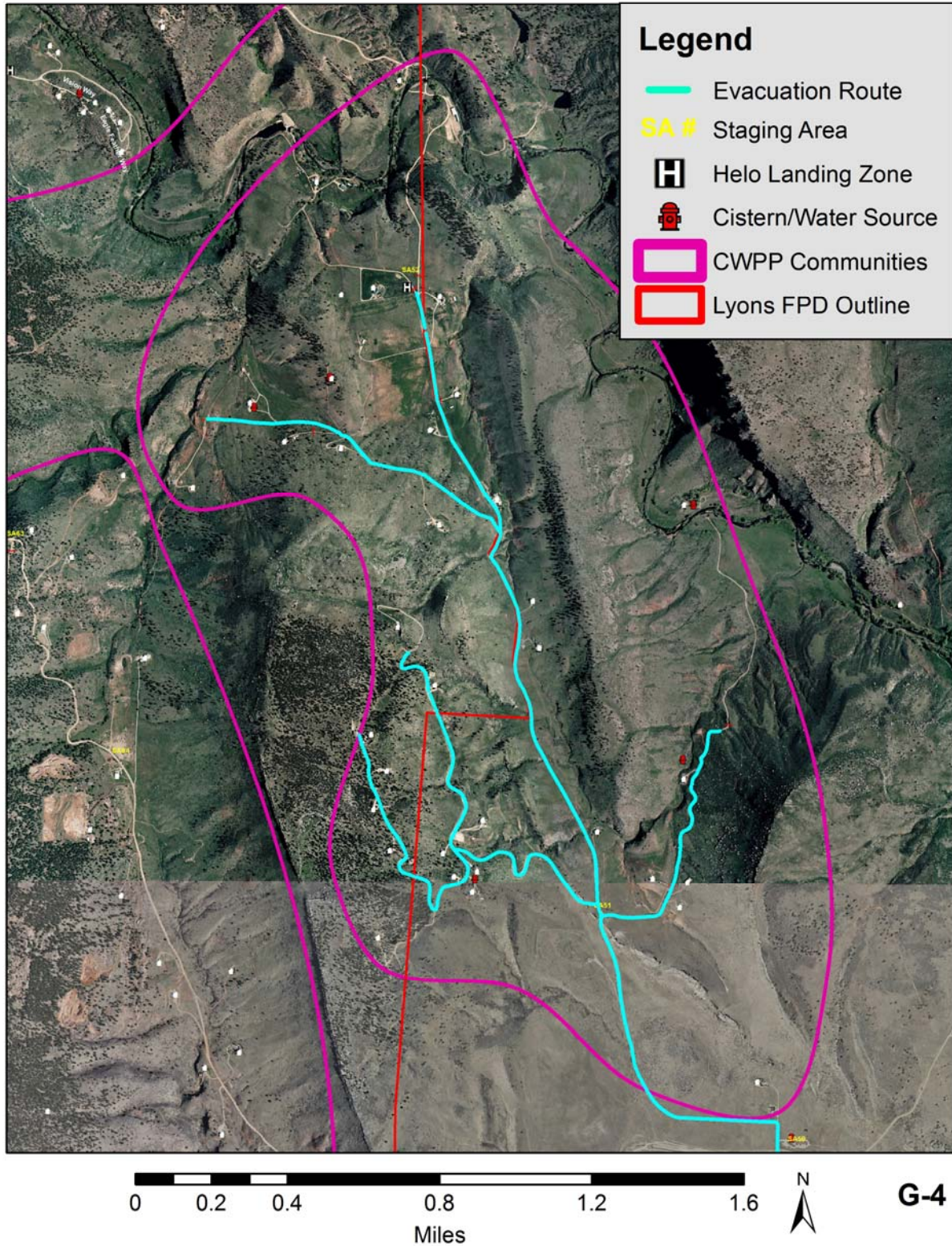
Homeowners need to improve defensible space and Firewise maintenance.

Investigate alternate emergency egress routes to the north and west.

Wildfire Risk and Hazard Severity Assessment		
Neighborhood: Dakota Ridge		
Neighborhood Rating: High		
Number of Houses: 34		
Means of Access to Neighborhood		
Fire Department Response Time	Greater than 20 minutes	9
Ingress and Egress	One Road In and Out	7
Road Width	Some less than 20 ft	3
Road Condition	Not Paved, Graded, Some County Maintained, >5%	5
Fire Service Access	> 300 Ft, Insufficient Turnarounds and Pullouts	2
Street Signs	Present, some are ambiguous	1
Vegetation Along Access Route	Brush, some areas require mitigation	5
Other Access Hazards	Locked Gates across Roads	2
Below Items were evaluated for each house, then averaged for the neighborhood:		
Vegetation (Fire Behavior Fuel Models)		
Fuel Models 2, 4, 6	Mostly grass and brush	8.2
Defensible Space Mitigation		
Zone 1: within 30 ft	Partial Mitigation	8.2
Zone 2: 30 – 100 ft	Partial Mitigation	3.2
Zone 3: beyond 100 ft	Partial Mitigation	1.1
Topography		
Slope	Average 12%	3.0
Building Setback	A couple < 30 ft from slope > 30%	0.1
Hazardous Topography	A few steep slopes	0.4
Firefighter Access		
Address Visible	Many not visible, most not reflective	1.9
Driveway Length	Many > 300 ft	1.4
Turnaround for Engine	Most OK	0.7
Driveway Clearance for Engine	Most OK but several locked gates	0.4
Building Construction		
Roofing Material	Predominantly asphalt, 3 with wood shakes	2.2
Siding	Mostly wood or heavy timber	6.6
Decks	Many wood decks, most open underneath	3.2
Combustibles within 30 feet	Several problem areas	3.4
Firefighting Water Availability		
Water Supply	Severely insufficient, only 1 cistern located	9.9
Utility Hazards		
Aboveground Gas or Propane	Propane tanks common	1.6
Aboveground Electric Wires	Isolated	0.1
Neighborhood Total		89.6

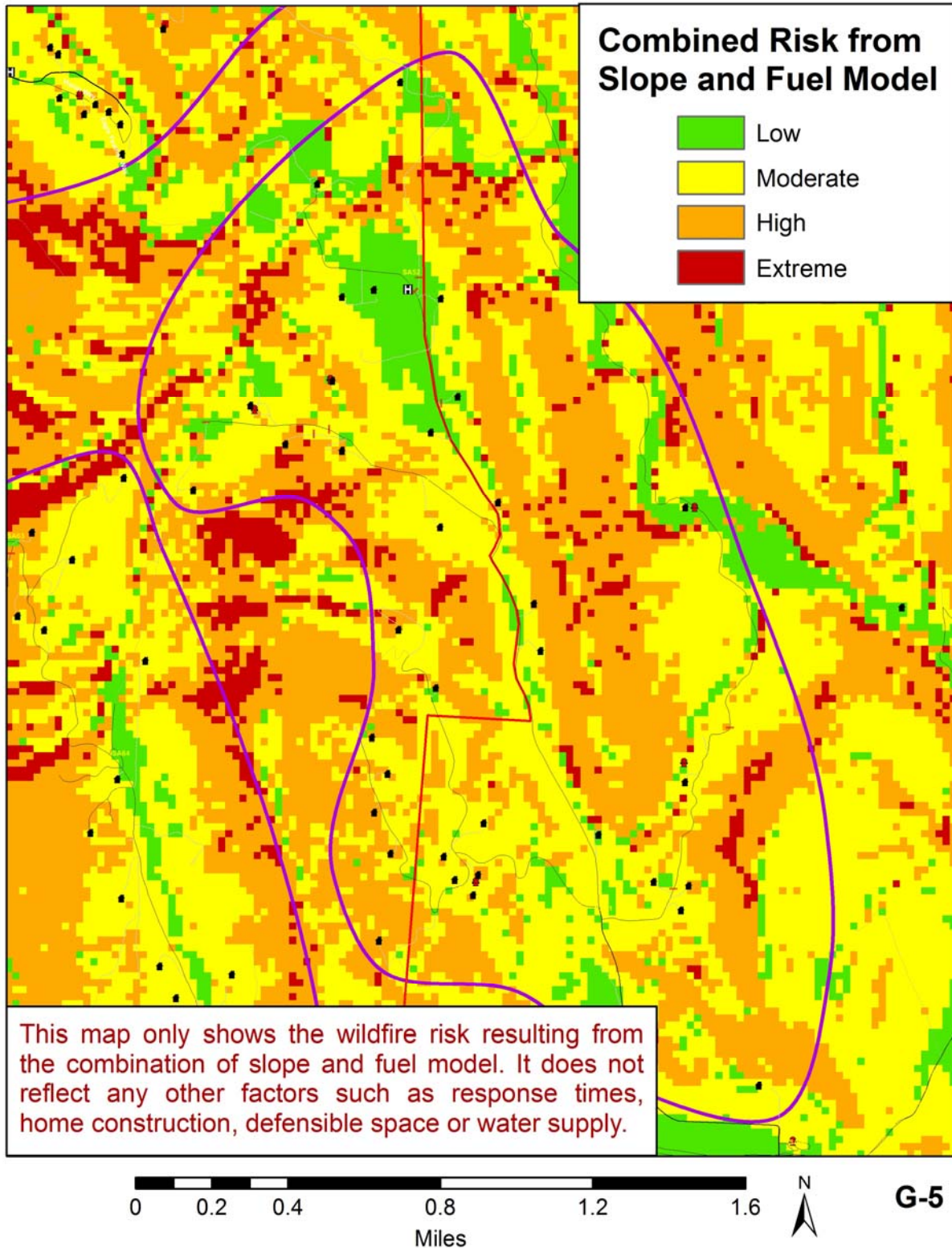
CWPP Community: Dakota Ridge

Wildfire Risk: High



CWPP Community: Dakota Ridge

Wildfire Risk: High



APPENDIX H

X-BAR 7/BLUE MOUNTAIN DETAILED COMMUNITY ASSESSMENT RESULTS

Overall Risk Assessment: **High**

Houses: 132

Description: X-Bar 7 and Blue Mountain neighborhoods occupy a sprawling network of roads in the foothills of Larimer County. The area is bordered on the north and west by US Forest Service lands, with no roads and just a few jeep trails for access. It is bordered on the East by Larimer County open space, some quarries to the southeast, and on the south by Spring Gulch.

Average Lot Size: 35 Acres, with some larger.

Access Ingress/Egress, Response Time: Single Access from Blue Mountain Road. Fire Station 2 is located within the neighborhood, but this is an understaffed satellite station with slow response by volunteers. The majority of houses have greater than 20 minute response times from the station due to length of travel over steep, windy gravel roads. Roads are privately maintained and passable in all seasons. Steepness of some roads restricts access by fire engines and tenders. Some homes have two accesses, but most have only one, and ultimately all roads funnel to one exit.

Predominant Fuel Model: Mostly grass and brush (fuel models 2 and 6), with some stands of open and closed crown ponderosa (fuel models 8 and 9), and some heavy deciduous growth along the Little Thompson River.

Terrain/Topography: Foothills with some very steep areas.

Home Construction: Age of homes varies. Roofs are mostly asphalt, some metal, no wood shakes. Most houses have wood siding and wood decks. Most homes have above ground propane tanks.

Defensible Space: Many homeowners have done a good job with mitigation in zone 1, but many others have not done any. Zones 2 and 3 are generally partial at best, with large lot sizes.

Water Supply: Insufficient. No hydrants. 30,000 gallon cistern with pump located at Station 2. There are 2 community cisterns at Vision Way and River Way, and 10 individual fire cisterns were located. Although the Little Thompson River runs through the area, drafting from river would be very difficult due to steep slopes, and by wild fire season it river is generally dry.

Special Hazards: Very rough, steep roads and very long response times

Issues:

Insufficient water supply.

Lack of defensible space.

Poor ingress/egress due to road conditions.

Fire department access for locked gates.

Recommendations:

Homeowners improve defensible space and Firewise maintenance.

Road work to improve access for fire apparatus, widen roads, create turnarounds and pullouts on roads and driveways.

Homeowners ensure visible address signs.

Standardize street signs.

Identify safety zones in case evacuation is not feasible.

More community cisterns.

Install Knox boxes for all gates.

Landowners with greater than 40 acres may be eligible for agricultural tax savings for fire mitigation work.

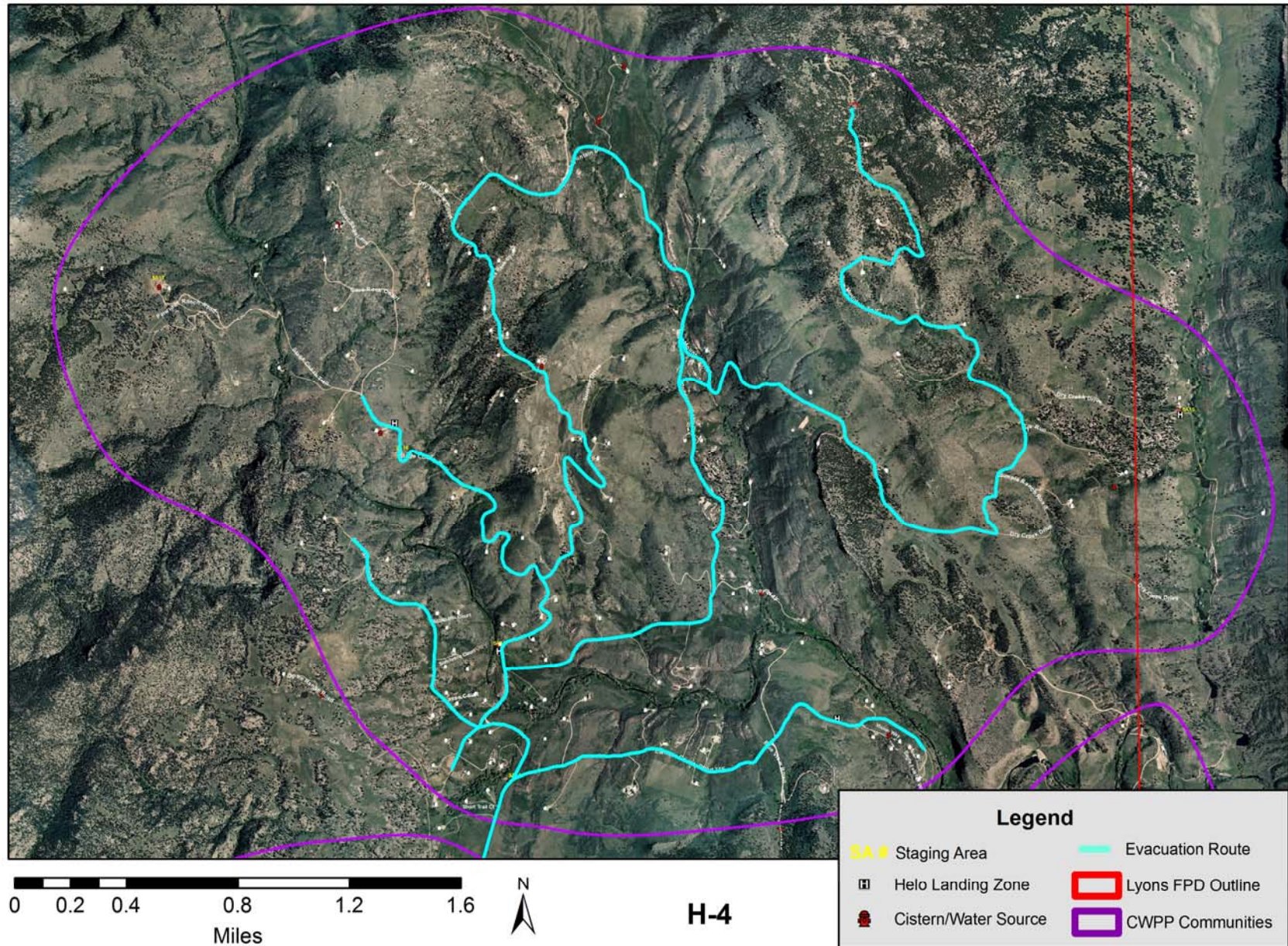
Perform mitigation for brush alongside roadways for egress routes on Grey Mountain Drive and Blue Mountain Trail.

Investigate alternate emergency egress route to the north. This alternate route may also be used for flood event involving the Little Thompson River.

Wildfire Risk and Hazard Severity Assessment		
Neighborhood: XBar 7 / Blue Mountain		
Neighborhood Rating: High		
Number of Houses: 132		
Means of Access to Neighborhood		
Fire Department Response Time	> 20 minutes	9
Ingress and Egress	One Road In and Out	7
Road Width	20-24 Feet	2
Road Condition	Not Paved, Graded, Privately Maintained, >5%	5
Fire Service Access	Few Turnaround and Pullouts	2
Street Signs	New County Signs, No Problems	0
Vegetation Along Access Route	One Area Requires Mitigation	5
Other Access Hazards	Very Steep Roads	2
Below Items were evaluated for each house, then averaged for the neighborhood:		
Vegetation (Fire Behavior Fuel Models)		
Fuel Models 2, 5, 8 & 9	Mostly Mix of Grass & Brush, some trees	8.6
Defensible Space Mitigation		
Zone 1: within 30 ft	Many well done, some not	7.8
Zone 2: 30 – 100 ft	Mostly Partial	3.4
Zone 3: beyond 100 ft	Minimal	1.4
Topography		
Slope	Average 15%	3.9
Building Setback	A Few < 30 feet from slope > 30%	1.1
Hazardous Topography	A Few Very Steep Slopes	0.5
Firefighter Access		
Address Visible	Many not visible	2.6
Driveway Length	Many > 300 feet	2.1
Turnaround for Engine	Several not	0.8
Driveway Clearance for Engine	Most OK or N/A	0.1
Building Construction		
Roofing Material	Predominantly Asphalt, some metal, no shakes	0
Siding	Predominantly Wood	7.3
Decks	Many wood decks, most open underneath	3.4
Combustibles within 30 feet	Most OK but several problem areas	1.0
Firefighting Water Availability		
Cisterns	Severely Insufficient, 9 cisterns located	9.7
Utility Hazards		
Aboveground Gas or Propane	Propane tanks very common	2.3
Aboveground Electric Wires	Only a few in vicinity of houses	0.2
Neighborhood Total		88.2

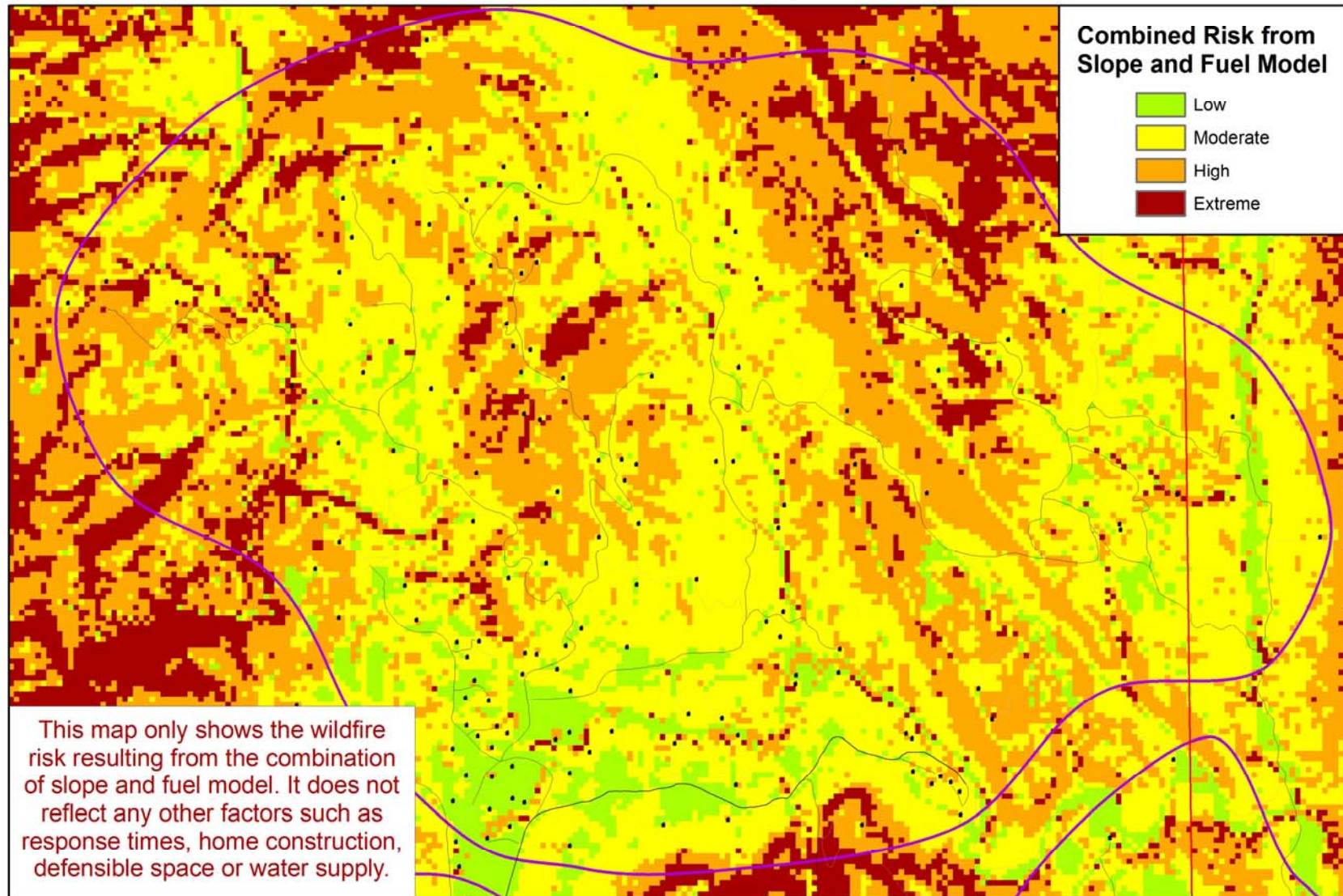
CWPP Community: X-Bar 7/Blue Mountain

Wildfire Risk: High



CWPP Community: X-Bar 7/Blue Mountain

Wildfire Risk: High



APPENDIX I

STONE CANYON/EAGLE RIDGE DETAILED COMMUNITY ASSESSMENT RESULTS

Overall Risk Assessment: **High**

Houses: 42

Description: Stone Canyon/Eagle Ridge is located on a 3-mile long north/south running ridge and canyon north of the town of Lyons. Stone Canyon begins as a wide grassy valley which gets steeper and narrower as it proceeds up the canyon. Eagle Ridge is steep and in places heavily treed. It contains several working and abandoned sandstone quarries. It is bordered on the east by “closed” open space and public land on Indian Mountain, on the south by the Stone Canyon development, on the southwest by a steep, heavily wooded cliff down to the town of Lyons and Steamboat Valley, and on the north and northwest by steep, densely wooded, vacant land.

Average Lot Size: Over 20 Acres (a few 5 - 10 Acres, most 35 acres). Due to the large number of unoccupied lots, the overall density is low at 1 house per 44 acres.

Access Ingress/Egress, Response Time: Stone Canyon/Eagle Ridge is accessed from Stone Canyon Road, a graded dirt road which is privately maintained in good condition for year round access by heavily laden quarry trucks. Eagle Ridge road is a very narrow, privately maintained, steep, fairly graded dirt road. Access for fire vehicles is difficult and slow, requiring multi-point turns at several switchbacks. The width is insufficient to allow simultaneous ingress by fire vehicles and evacuation by autos and water shuttle operations. Sightlines are short on many stretches, and pullouts are insufficient. Some mitigation is required along Eagle Ridge Road and the north end of Stone Canyon Road where it wraps around the north end of the ridge.

Predominant Fuel Model: Grass in the canyon (fuel model 2), open and closed ponderosa stands on the ridge (fuel models 8 and 9), with several areas of heavy brush (fuel model 6), and some rock areas in the quarries.

Terrain/Topography: steep

Home Construction: Firewise construction varies with the age of the houses. Roofs are nearly all asphalt or metal, with only 1 shake. Siding is over half wood, with many wood decks, mostly open underneath. Newly constructed homes are built to the latest building codes, but many are of older construction and tend to have more wood, open soffits, etc. Several homes have combustible materials within 30 ft of the home. Most houses have visible address markers, although none are reflective. Most houses have above ground propane tanks.

Defensible Space: Zone 1 is 1/3 well done, 1/3 partial and 1/3 none. Zones 2 and 3 are partial.

Water Supply: Insufficient. No hydrants or pressurized sources. Only 1 cistern identified on Stone Canyon road, about half the houses on Eagle Ridge Rd have 1500 gal cisterns, and 1 house has 5 above ground cisterns (not always filled) with pump. There is limited room for set up of water

supply operations, long transit times from the nearest hydrant at the Stone Canyon Development, and limited passing room for tenders.

Special Hazards: No emergency egress, road too narrow for simultaneous evacuation and fire access for top of Eagle Ridge.

Issues:

Eagle Ridge emergency ingress/egress

Access Road Mitigation

Insufficient water supply, particularly for Stone Canyon.

Inadequate defensible Space.

Fire department access for locked gates.

Missing addresses on Stone Canyon Road.

Recommendations:

Open second access along Lewis Lane for emergency use.

Extend hydrant line up Stone Canyon.

Install large community cisterns.

Plan and complete fuel mitigation projects along Eagle Ridge Road and north end of Stone Canyon Road.

Homeowners improve Defensible space and Firewise maintenance.

Install additional pullouts on Eagle Ridge Road

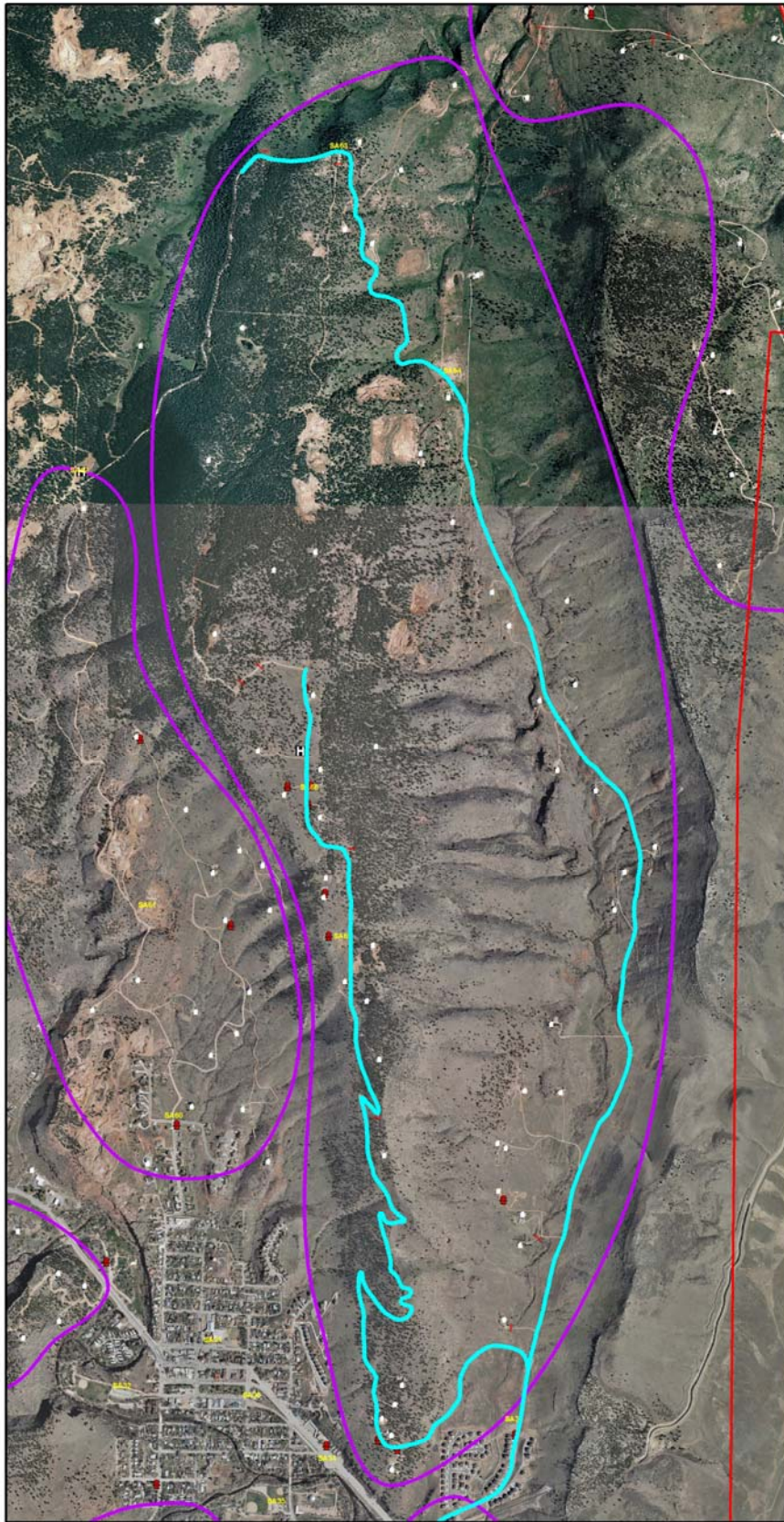
Homeowners install turnarounds and pullouts for long driveways.

Owners with locked gates install Knox box or provide gate codes to fire department.





Homeowners ensure visible address signs on Stone Canyon Road.

Wildfire Risk and Hazard Severity Assessment		
Neighborhood: Stone Canyon/Eagle Ridge		
Neighborhood Rating: High		
Number of Houses: 42		
Means of Access to Neighborhood		
Fire Department Response Time	Some Areas > 20 minutes	9
Ingress and Egress	One Road In and Out	7
Road Width	Stone Canyon > 24 Ft, Eagle Ridge < 20 Feet, not wide enough for 2-way traffic	4
Road Condition	Not Paved, Privately Maintained, Graded, some sections >5%	5
Fire Service Access	Insufficient Pullouts, Engine Access Challenging	2
Street Signs	No Issues	0
Vegetation Along Access Route	Several Areas Require Mitigation	5
Other Access Hazards	Several Switchbacks require backing	3
Below Items were evaluated for each house, then averaged for the neighborhood:		
Vegetation (Fire Behavior Fuel Models)		
Fuel Models 2, 6, 8 & 9	Mix of ponderosa, brush, and grass	9.3
Defensible Space Mitigation		
Zone 1: within 30 ft	Partial mitigation	7.9
Zone 2: 30 – 100 ft	Partial mitigation	3.1
Zone 3: beyond 100 ft	Minimal mitigation	1.2
Topography		
Slope	Average 9%	2.3
Building Setback	A few less than 30 feet from slope > 30%	2.5
Hazardous Topography	A few on ridgeline	0.5
Firefighter Access		
Address Visible	Most Non-reflective, a few not visible	1.5
Driveway Length	Many > 300 feet	2.4
Turnaround for Engine	Most OK or N/A	1.3
Driveway Clearance for Engine	Most OK or N/A	0.1
Building Construction		
Roofing Material	Predominantly Asphalt, 1 with wood shakes	0.6
Siding	About half wood, half non-combustible	6.0
Decks	Many wood deck, some composite, mostly open	2.8
Combustibles within 30 feet	Most OK but several problem areas	2.8
Firefighting Water Availability		
Cisterns	Several on Eagle Ridge, only 1 on Stone Canyon	8.9
Utility Hazards		
Aboveground Gas or Propane	Propane tanks common	2.0
Aboveground Electric Wires	Only a few in vicinity of houses	0.5
Neighborhood Total		86.6

CWPP
Community:
Stone Canyon
Eagle Ridge
Wildfire Risk: High



Legend

-  Evacuation Route
-  Staging Area
-  Helo Landing Zone
-  Cistern/Water Source
-  CWPP Communities
-  Lyons FPD Outline

0 0.2 0.4 0.8 1.2 1.6
Miles

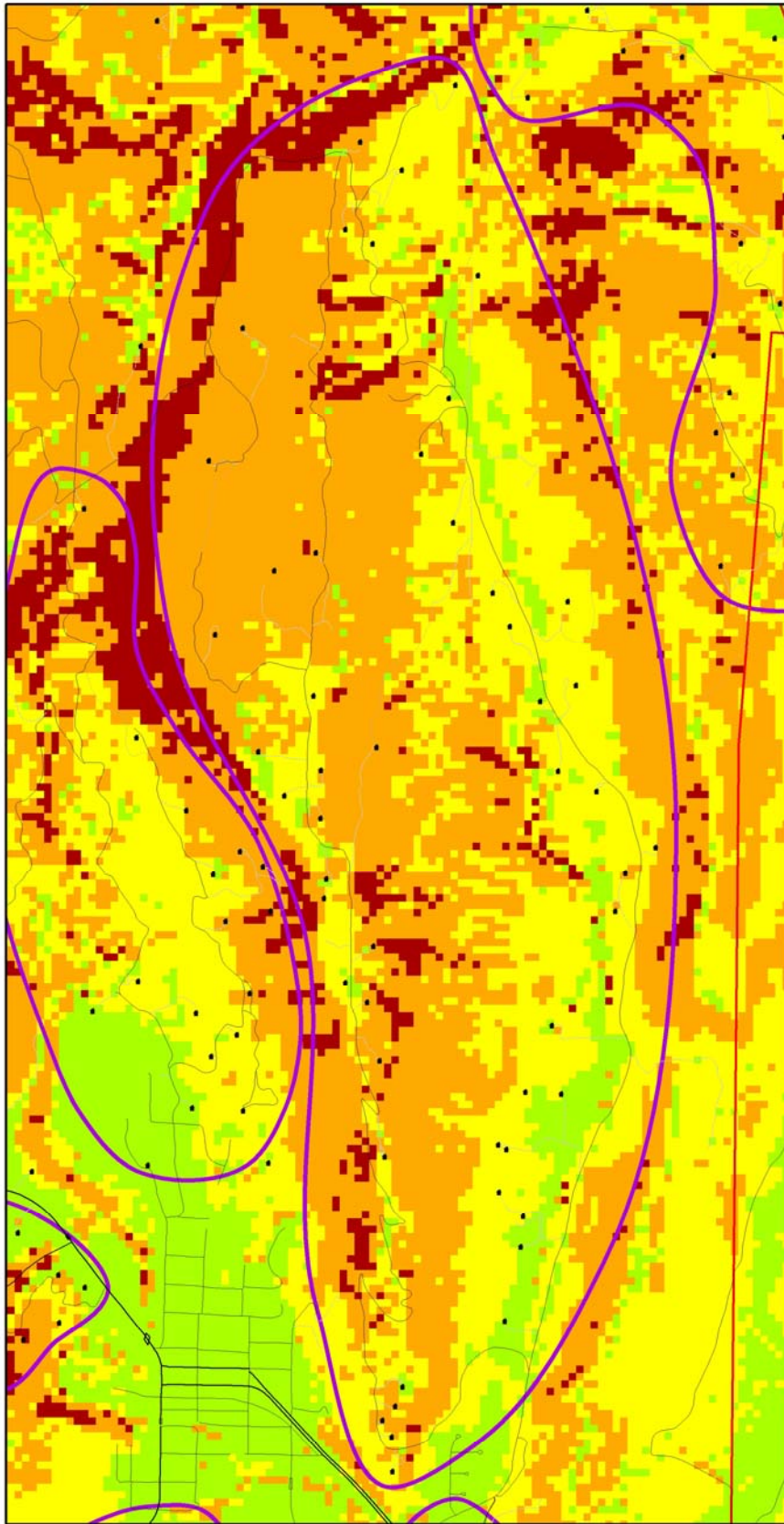


CWPP
Community:
Stone Canyon
Eagle Ridge
Wildfire Risk: High

**Combined Risk from
Slope and Fuel Model**



This map only shows the wildfire risk resulting from the combination of slope and fuel model. It does not reflect any other factors such as response times, home construction, defensible space or water supply.



0 0.2 0.4 0.8 1.2 1.6
Miles



APPENDIX J

STEAMBOAT VALLEY DETAILED COMMUNITY ASSESSMENT RESULTS

Overall Risk Assessment: **High**

Houses: 16

Description: Steamboat Valley is located directly north of Lyons, accessed via town streets. It is a broad valley but many of the houses are located up the steep sides of the valley walls. Several working and abandoned quarries are in the vicinity.

Average Lot Size: Mostly 5 acres, a few 35 Acres. Large number of undeveloped lots and makes overall density low, at 1 house per 27 acres.

Access Ingress/Egress, Response Time: Single point of access via 5th St through town. Steamboat Valley Road is a long, steep, narrow, somewhat rough, privately maintained road with few turnouts. The road is in several sections, with unmarked forks. Additionally, many houses have long, steep, narrow driveways and one house is not accessible by the fire engine. Access time averages 5-10 minutes from Station 1, but several houses are longer.

Predominant Fuel Model: Grass (fuel model 2), brush (fuel model 6), with some ponderosa, mostly open crown (fuel model 8).

Terrain/Topography: Average slope is 21%. Houses are predominantly located on steep slopes on the sides of the valley, with no setback.

Home Construction: Many new houses are built to modern codes. Only 1 wood shake roof. Wood siding is common, with many wood decks. About half of the homes have above ground propane tanks.

Defensible Space: Many homeowners have done a good job of mitigation in zone 1, but zones 2 and 3 are generally partial and need additional work.

Water Supply: Severely insufficient, only 1 cistern identified. There are no hydrants or pressurized sources. Water would have to be shuttled from the nearest hydrant at Vasquez Rd, and Steamboat Valley Road is not wide enough for fire vehicles to pass, slowing the process.

Special Hazards: 1 new bridge to newer home, need to check weight limit. 1 house not accessible by engine.

Issues:

Lack of turnarounds and pullouts for fire apparatus.

Unmarked forks in road are confusing.

Insufficient defensible space.

Recommendations:

Homeowners improve defensible space and Firewise maintenance.

Road work to improve access for fire apparatus, widen roads, create turnarounds and pullouts on roads and driveways.

Improve street and address signs. Each fork needs to list which addresses are in each direction, and each driveway entrance needs to list which houses it serves.

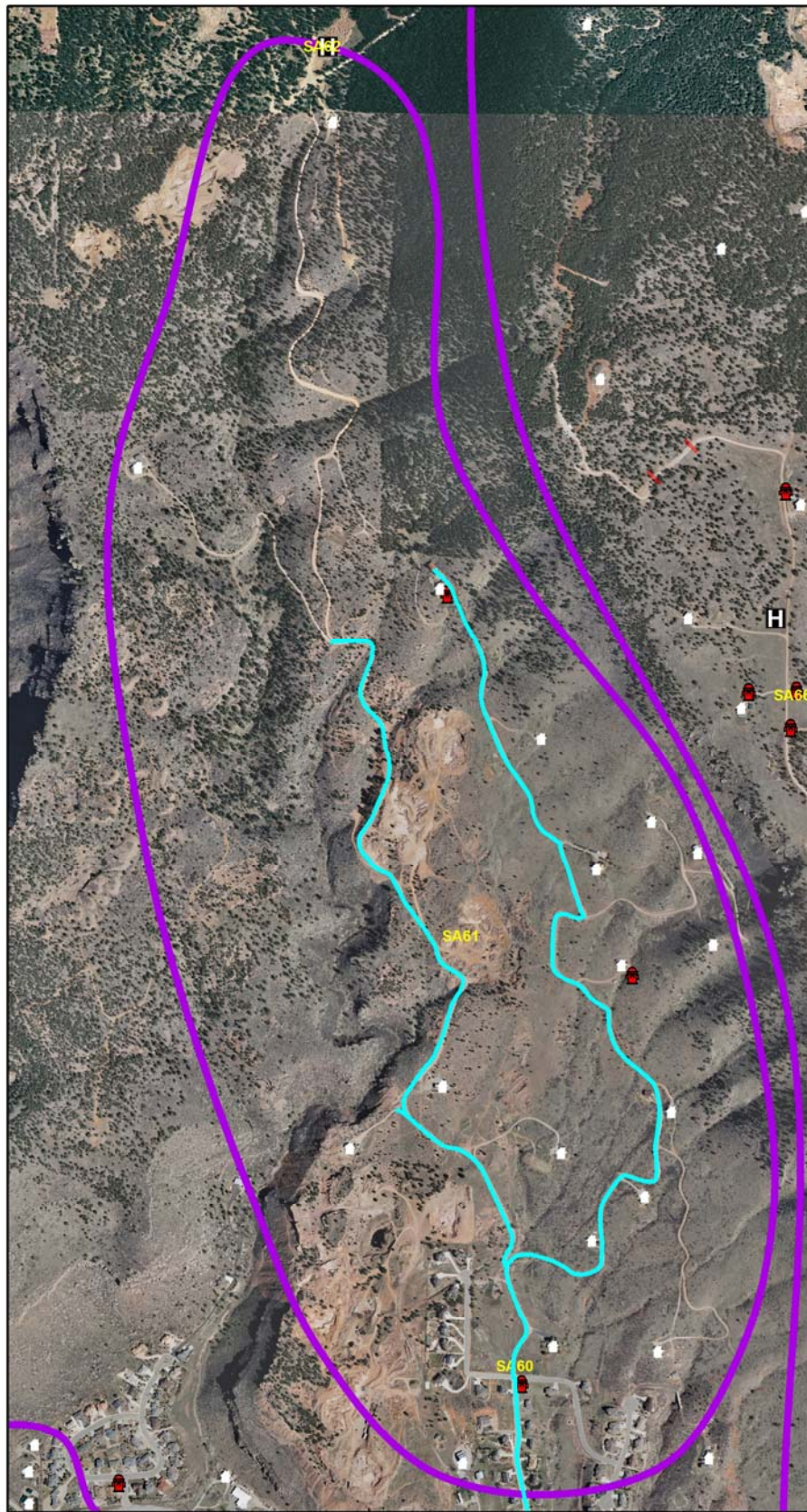
Maintain upper Steamboat Valley Road as emergency access/egress.

Wildfire Risk and Hazard Severity Assessment		
Neighborhood: Steamboat Valley		
Neighborhood Rating: High		
Number of Houses: 16		
Means of Access to Neighborhood		
Fire Department Response Time	5-10 Minutes	3
Ingress and Egress	One Road In and Out	7
Road Width	< 20 feet	4
Road Condition	Not Paved, Fairly Graded, Privately Maintained, >5%	5
Fire Service Access	Insufficient Turnaround and Pullouts	2
Street Signs	Forks in road confusing	1
Vegetation Along Access Route	Several Areas Require Mitigation	2
Other Access Hazards		0
Below Items were evaluated for each house, then averaged for the neighborhood:		
Vegetation (Fire Behavior Fuel Models)		
Fuel Models 6, 8 & 9	Predominantly brush, some ponderosa open and closed crown	9.4
Defensible Space Mitigation		
Zone 1: within 30 ft	Good mitigation	4.4
Zone 2: 30 – 100 ft	Partial mitigation	3.2
Zone 3: beyond 100 ft	Partial mitigation	2
Topography		
Slope	Average 21%	5.6
Building Setback	A few < 30 feet from slope > 30%	3.7
Hazardous Topography	Minimal	0.3
Firefighter Access		
Address Visible	Many not visible	2.6
Driveway Length	Many > 300 feet	1.9
Turnaround for Engine	Several insufficient	2.1
Driveway Clearance for Engine	Most OK or N/A	0.5
Building Construction		
Roofing Material	Predominantly Asphalt, 1 with wood shakes	2.6
Siding	Predominantly Wood	8.1
Decks	Many wood decks, mostly open	2.1
Combustibles within 30 feet	Most OK but a couple of problem areas	0.9
Firefighting Water Availability		
Cisterns	Severely Insufficient, only 1 cistern identified	9.7
Utility Hazards		
Aboveground Gas or Propane	About half have Propane tanks	1.5
Aboveground Electric Wires	About half	0.9
Neighborhood Total		85.5

CWPP

Community: Steamboat Valley

Wildfire Risk: High



Legend

-  Evacuation Route
-  Staging Area
-  Helo Landing Zone
-  Cistern/Water Source
-  CWPP Communities

0 0.1 0.2 0.4 0.6 0.8
Miles

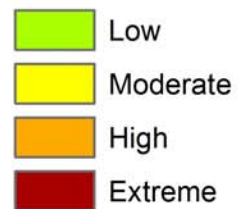


J-4

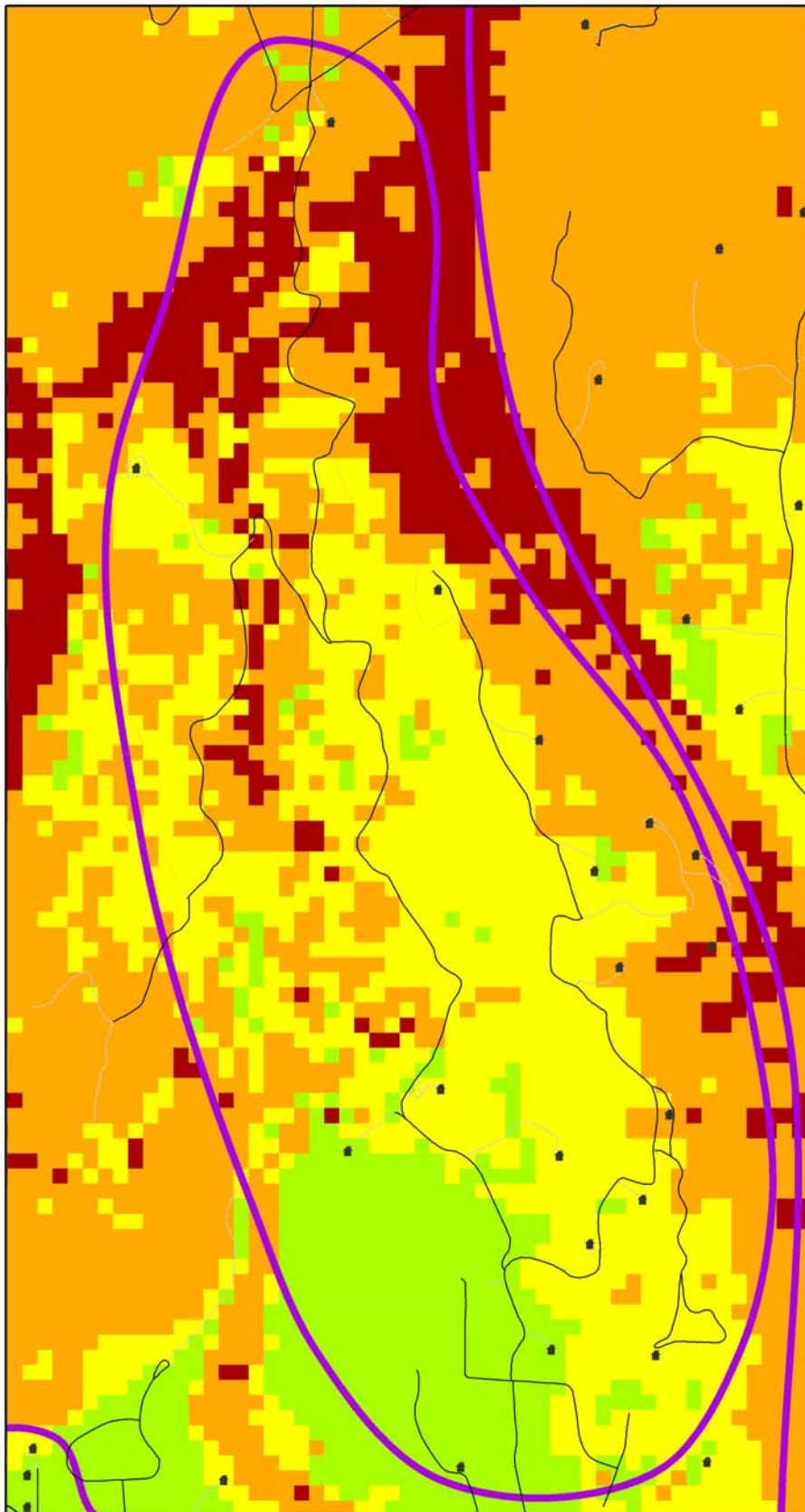
CWPP Community: Steamboat Valley

Wildfire Risk: High

Combined Risk from Slope and Fuel Model



This map only shows the wildfire risk resulting from the combination of slope and fuel model. It does not reflect any other factors such as response times, home construction, defensible space or water supply.



0 0.1 0.2 0.4 0.6 0.8
Miles



APPENDIX K

TOWN OF LYONS (CENTRAL)

DETAILED COMMUNITY ASSESSMENT RESULTS

Overall Risk Assessment: High

Houses: approximately 350

Description: The town of Lyons was divided into the historic central section north and south of Main Street, and the newer developments on the outskirts of town. The reason is the difference in Firewise construction methods and the associated wildfire risk. Even though the center of town is urban, the proximity within ½ mile of wildland defines this part of town as part of the Wildland Urban Interface. There is a risk of a wildfire spreading by embers from the surrounding open space the center of town. This part of the community includes the historic town, which consists of many older, small houses on small lots, and a few mobile home parks. The south side of town is along the St Vrain River, with heavy deciduous vegetation. The north side above High Street is drier. Individual houses were not surveyed; predominant conditions were evaluated. Also, only residences were considered (not businesses).

Average Lot Size: less than ¼ acre.

Access Ingress/Egress, Response Time: Less than 5 minutes from Station 1. Two accesses to most houses on paved town roads. Many homes do not have addresses visible from the road, some are accessed from alleys, and inconsistent numbering sequences may slow response.

Predominant Fuel Model: Heavy deciduous (fuel model 10), with foundation plantings around houses.

Terrain/Topography: Mostly flat.

Home Construction: Mostly older wood homes with wood siding. These homes were not built to modern fire codes. There are a few wood shake roofs, mostly on accessory structures, and several mobile homes.

Defensible Space: Virtually nonexistent. Heavy vegetation around closely spaced houses increases the risk of a fire spreading to adjacent structures.

Water Supply: Excellent, on town hydrant system. Hydrants require testing and some hose fittings are blocked by plantings or backfill.

Special Hazards: Close exposures of adjacent wood houses and structures.

Issues:

Lack of defensible space.

Missing address signs and inconsistent house numbering scheme.

Recommendations:

Town of Lyons conduct required annual hydrant testing.

Homeowners ensure hydrants are kept clear.

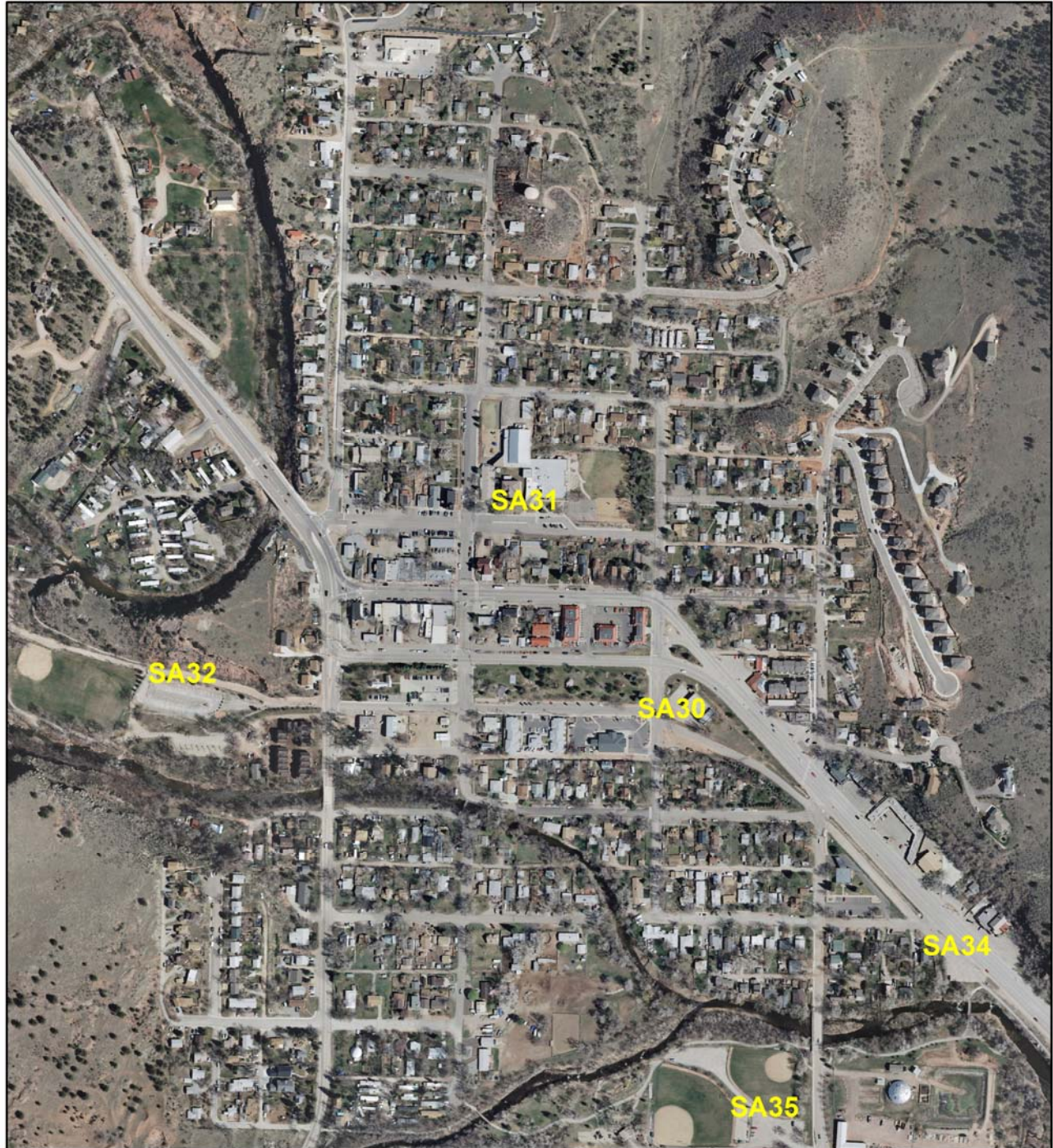
Homeowners improve defensible space and Firewise maintenance. Avoid plants adjacent to foundation.

Adopt standard addressing scheme.

Wildfire Risk and Hazard Severity Assessment		
Neighborhood: Town of Lyons (Central)		
Neighborhood Rating: High		
Number of Houses:		
Means of Access to Neighborhood		
Fire Department Response Time	Less than 5 minutes	1
Ingress and Egress	2 accesses	0
Road Width	Most > 24 Feet	0
Road Condition	Paved, Town maintained, flat	0
Fire Service Access	No issues	0
Street Signs	No problems noted	0
Vegetation Along Access Route	Fuel model 10	12
Other Access Hazards	Electric Wires ?	
Below Items were evaluated for each house, then averaged for the neighborhood:		
Vegetation (Fire Behavior Fuel Models)		
Heavy deciduous - fuel model 10	Heavy deciduous	20
Defensible Space Mitigation		
Zone 1: within 30 ft	Virtually non-existent	15
Zone 2: 30 – 100 ft	Minimal	7
Zone 3: beyond 100 ft	N/A due to small lot sizes	0
Topography		
Slope	Mostly Flat	1
Building Setback	N/A	0
Hazardous Topography	N/A	0
Firefighter Access		
Address Visible	Most Non-reflective but otherwise visible	1.5
Driveway Length	Most < 100 feet	0
Turnaround for Engine	Most OK or N/A	0
Driveway Clearance for Engine	Most OK or N/A	0
Building Construction		
Roofing Material	Predominantly Asphalt, a few wood shakes	2
Siding	Predominantly Wood	8
Decks	Many wood deck, some composite, mostly open	5
Combustibles within 30 feet	Major problem areas	5
Firefighting Water Availability		
Hydrants	All houses served by town hydrant system	0
Utility Hazards		
Aboveground Gas or Propane	Mostly underground gas	0
Aboveground Electric Wires	Common	2
Neighborhood Total		79.5

CWPP Community: Town of Lyons Central

Wildfire Risk: High



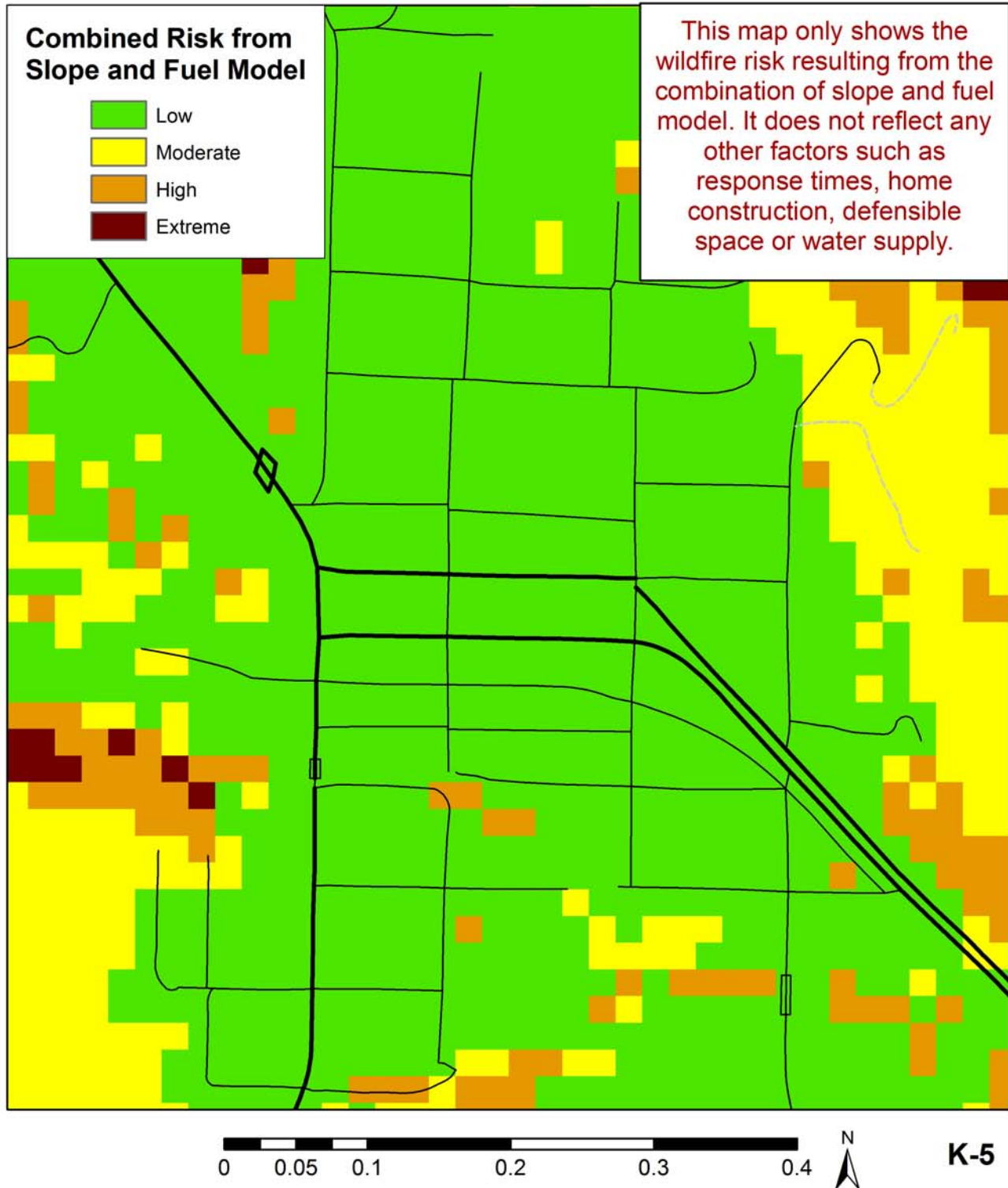
0 0.05 0.1 0.2 0.3 0.4



K-4

CWPP Community: Town of Lyons Central

Wildfire Risk: High



APPENDIX L

NORTH FOOTHILLS/UTE HIGHWAY/RABBIT MOUNTAIN DETAILED COMMUNITY ASSESSMENT RESULTS

Overall Risk Assessment: High

Houses: 43

Description: This community is an aggregation of areas along North Foothills and Ute Highways, east of the Town of Lyons, and on the southern edge of Rabbit Mountain. Portions of this community (Rabbit Mountain, Twilight and North Pointe) are located in the Hygiene Fire Protection District. There are several businesses along Ute Highway, but only residences were surveyed.

Average Lot Size: less than 1 acre.

Access Ingress/Egress, Response Time: Access from major highways with 5-10 minute response times. Locked gates may slow response. Roads within subdivisions are narrow, with insufficient room for passing and no pullouts, and there are overhanging branches on Highland Drive. Also, unsafe bridges at the west end of Highland Drives necessitate entry from the east end. Some homes do not have address signs visible from the road.

Predominant Fuel Model: Heavy deciduous (fuel model 10) along Ute Highway, mostly grass (fuel model 2) and heavy brush (fuel model 6) along North Foothills and Rabbit Mountain.

Terrain/Topography: Average slope is 12%. Terrain is flat along Ute Highway, foothills along North Foothills Highway and Rabbit Mountain.

Home Construction: Mostly wood or heavy timber. Rabbit Mountain and some North Foothills houses are newer construction with more Firewise construction methods. There are many wood decks. About half of the homes have above ground propane tanks.

Defensible Space: Mitigation is poor in zones 1 and 2; most lots are too small for zone 3. There are excessive amounts of flammable materials in the vicinity of many residences.

Water Supply: Hydrants along a portion of Ute Highway. Otherwise, only 1 cistern identified, so water shuttle operations would be required from the nearest hydrants.

Special Hazards: Several unrated bridges on access routes to houses on Highland Drive. Heavy fuel load of hazardous materials (such as tires, abandoned cars and trash) in several yards presents a hazard to firefighters.

Issues:

Fire department access for locked gates.

Insufficient water supply in areas not served by hydrants.

Recommendations:

Owners with locked gates install Knox box or provide gate codes to applicable fire department (Lyons or Hygiene).

Homeowners remove hazardous fuel, improve defensible space and perform Firewise maintenance.

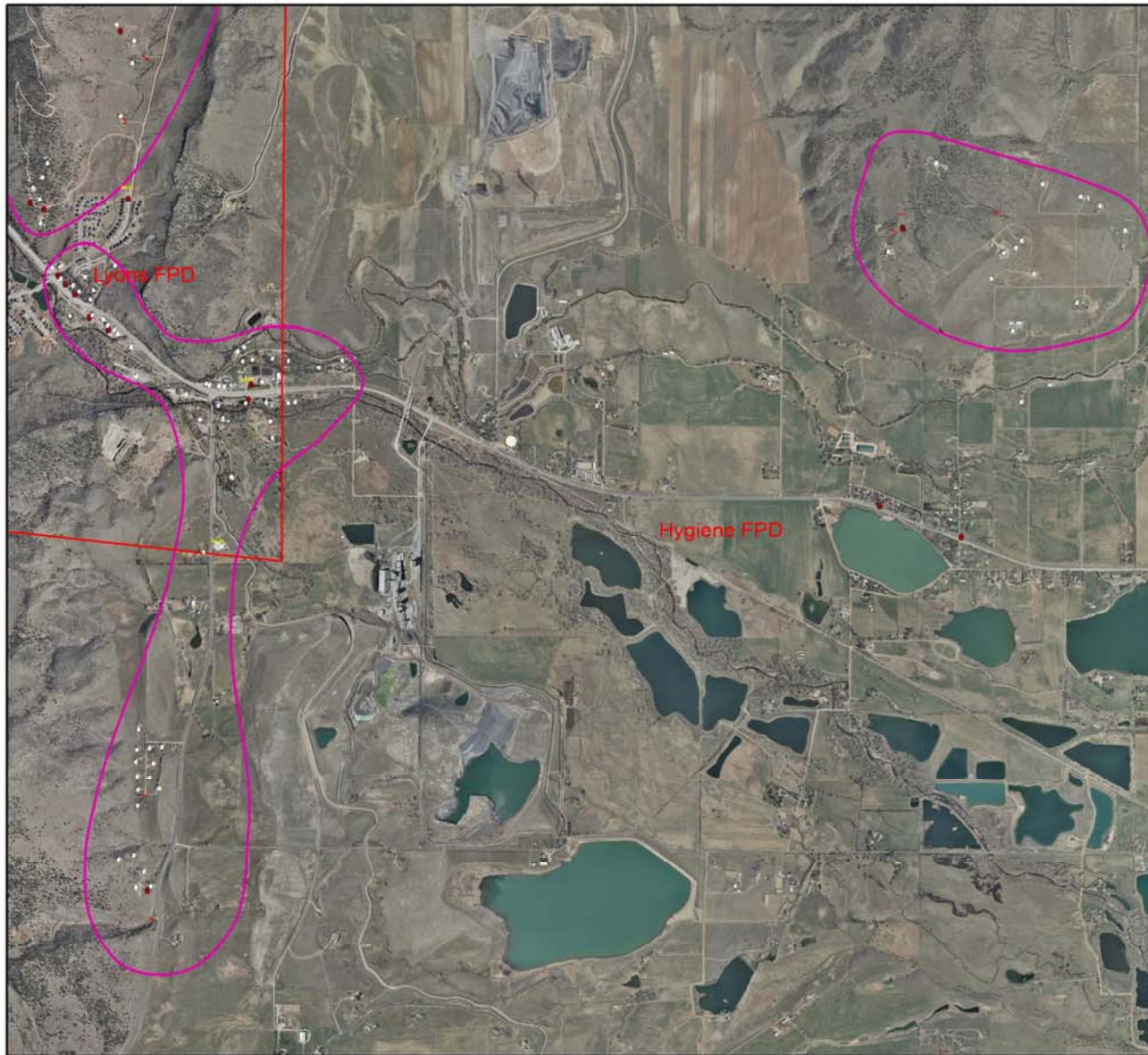
Additional cisterns needed for Twilight and Rabbit Mountain.

Homeowners ensure visible address signs

Brush mitigation at top of Rabbit Mountain Rd and Pointe View. Clear overhanging branches on Highland Drive.

Verify and post bridge weight limits; improve as necessary.

Wildfire Risk and Hazard Severity Assessment		
Neighborhood: North Foothills/Ute Highway/Rabbit Mountain		
Neighborhood Rating: High		
Number of Houses: 43		
Means of Access to Neighborhood		
Fire Department Response Time	5-10 minutes	3
Ingress and Egress	About half have one road in/out, rest have 2	3
Road Width	20-24 ft, some less than 20 ft in subdivisions	2
Road Condition	Paved access, graded dirt within subdivisions	2
Fire Service Access	Unrated bridges on Highland Ave	2
Street Signs	No Issues	0
Vegetation Along Access Route	Overhanging branches on Highland Ave	5
Other Access Hazards		
Below Items were evaluated for each house, then averaged for the neighborhood:		
Vegetation (Fire Behavior Fuel Models)		
Fuel Model 2,4,8 & 9		10.0
Defensible Space Mitigation		
Zone 1: within 30 ft	Partial mitigation	9.8
Zone 2: 30 – 100 ft	Partial mitigation	3.6
Zone 3: beyond 100 ft	Minimal mitigation	1.0
Topography		
Slope	Average 12%	3.0
Building Setback	A few less than 30 feet from slope > 30%	0.5
Hazardous Topography	A couple of steep slopes and chutes	0.5
Firefighter Access		
Address Visible	Many not readily visible or unable to find	1.9
Driveway Length	Most < 100 feet	0.8
Turnaround for Engine	Most OK or N/A	0.5
Driveway Clearance for Engine	Most OK or N/A	0.2
Building Construction		
Roofing Material	Predominantly Asphalt, 1 with wood shakes	0.6
Siding	Predominantly Wood, some heavy timber & non-combustible	5.2
Decks	Many wood decks, open underneath	2.8
Combustibles within 30 feet	Numerous major problem areas, some with hazardous materials	3.6
Firefighting Water Availability		
Cisterns	Some on town hydrants, otherwise only 1 cistern	7.9
Utility Hazards		
Aboveground Gas or Propane	Propane tanks common	1.5
Aboveground Electric Wires	Nearly half	0.9
Neighborhood Total		71.3



**CWPP
Community:
Ute Highway
North Foothills
Rabbit Mountain**

**Wildfire Risk:
Moderate**

Legend

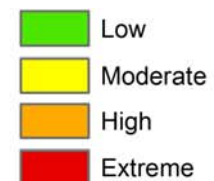
-  Evacuation Route
- Staging Area
-  Helo Landing Zone
-  Cistern/Water Source
-  CWPP Communities
-  Lyons FPD Outline

L-4

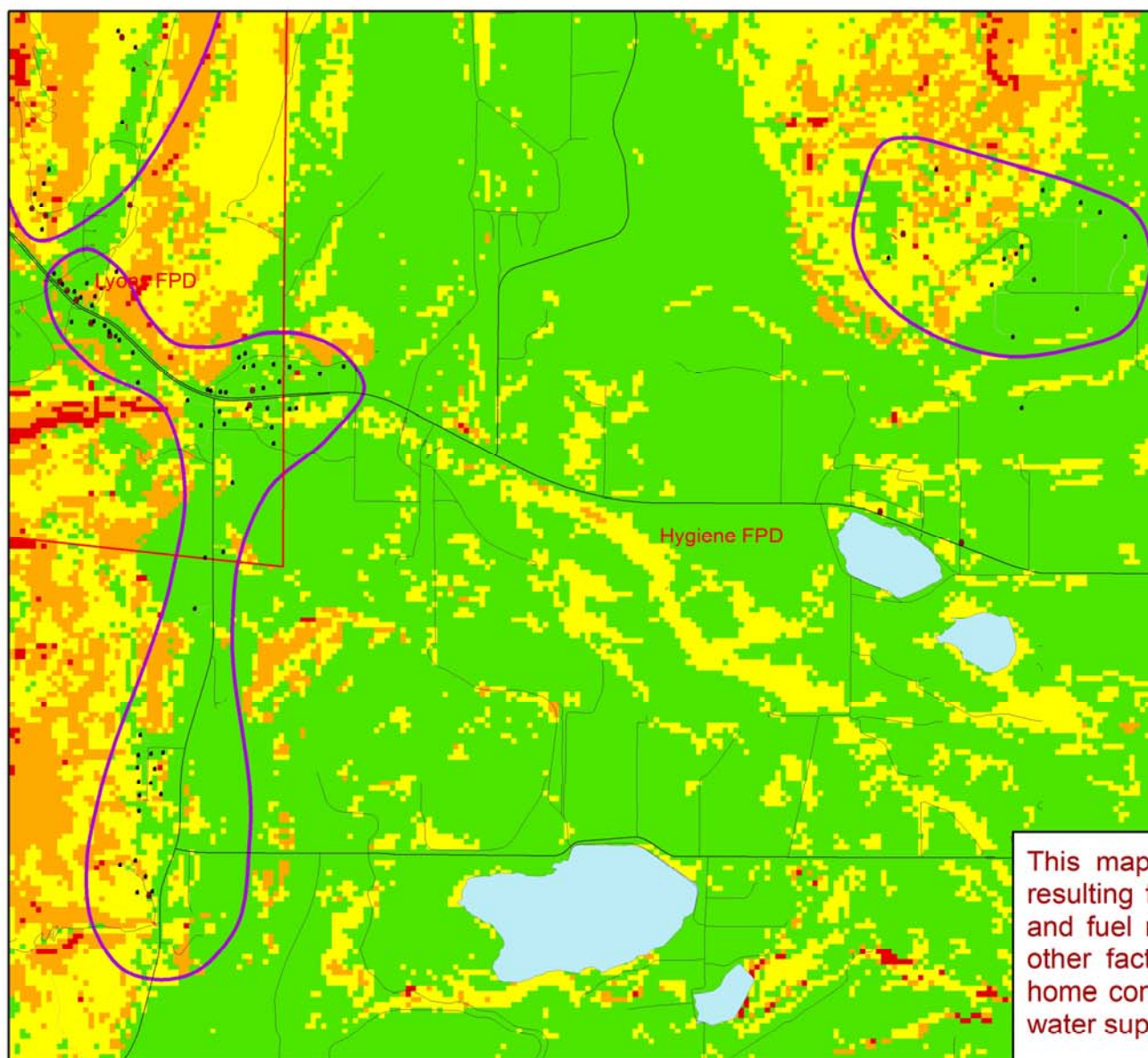
**CWPP
Community:
Ute Highway
North Foothills
Rabbit Mountain**

**Wildfire Risk:
Moderate**

**Combined Risk from
Slope and Fuel Model**



This map only shows the wildfire risk resulting from the combination of slope and fuel model. It does not reflect any other factors such as response times, home construction, defensible space or water supply.



L-5

APPENDIX M

SOUTH ST VRAIN

DETAILED COMMUNITY ASSESSMENT RESULTS

Overall Risk Assessment: **Moderate**

Houses: 38

Description: This neighborhood encompasses homes along the South St Vrain Creek, south of the town of Lyons and along State Highway 7 for a distance of 4 ½ miles. This area, close to the riverbed, contains irrigated farmland or heavy deciduous vegetation. The few houses around mile marker 28 are at the base of a steep slope with dense pines and fir trees. The area is bordered by Hall Ranch Boulder County Open Space on the north/west, and surrounded by National Forest at the west end.

Average Lot Size: Less than 5 acres

Access Ingress/Egress, Response Time: Access to most houses is 5-10 minutes over paved county and state roads. A few houses have 10-15 minute response times due to greater distance. The area in the vicinity of County Road 69 and Bradford St is confusing, with both street signs and house numbers missing. Unsafe bridge prevents access by any fire apparatus to four houses on South St Vrain Drive.

Predominant Fuel Model: Irrigated agricultural and closed-crown deciduous trees (fuel model 10).

Terrain/Topography: Mostly flat at the north end. Proceeding up into the canyon along Highway 7, the terrain gets steeper, with most of the houses located at the base of steep slopes.

Home Construction: Many older homes, only one shake roof, most have wood siding, several wood decks.

Defensible Space: All but 2 have done at least partial mitigation in zone 1, about half have partially mitigated zone 2, minimal zone 3, but several homes have combustibles within 30 feet of home. No exposed propane tanks noted, but about half the homes have above ground electrical wires.

Water Supply: Insufficient. No hydrants or pressurized sources. Only 1 cistern identified. Drafting from the South St Vrain Creek may be possible in the vicinity of Old St Vrain Road, but banks are too steep as you proceed up Highway 7, and water flow diminishes during fire season. Otherwise, water shuttling from the nearest hydrant in the town of Lyons would be required.

Special Hazards: Four houses are totally inaccessible to any fire fighting apparatus due to an unrated bridge.

Issues:

Unrated bridge prevents access to 4 houses.

Fire department access for locked gates.

Insufficient defensible space.

Missing street and address signs.

Recommendations:

Identify access points to draft from South St Vrain Creek.

Upgrade bridge at 28,300 block of South St Vrain Drive

Replace missing Street Signs.

Homeowners ensure visible address signs.

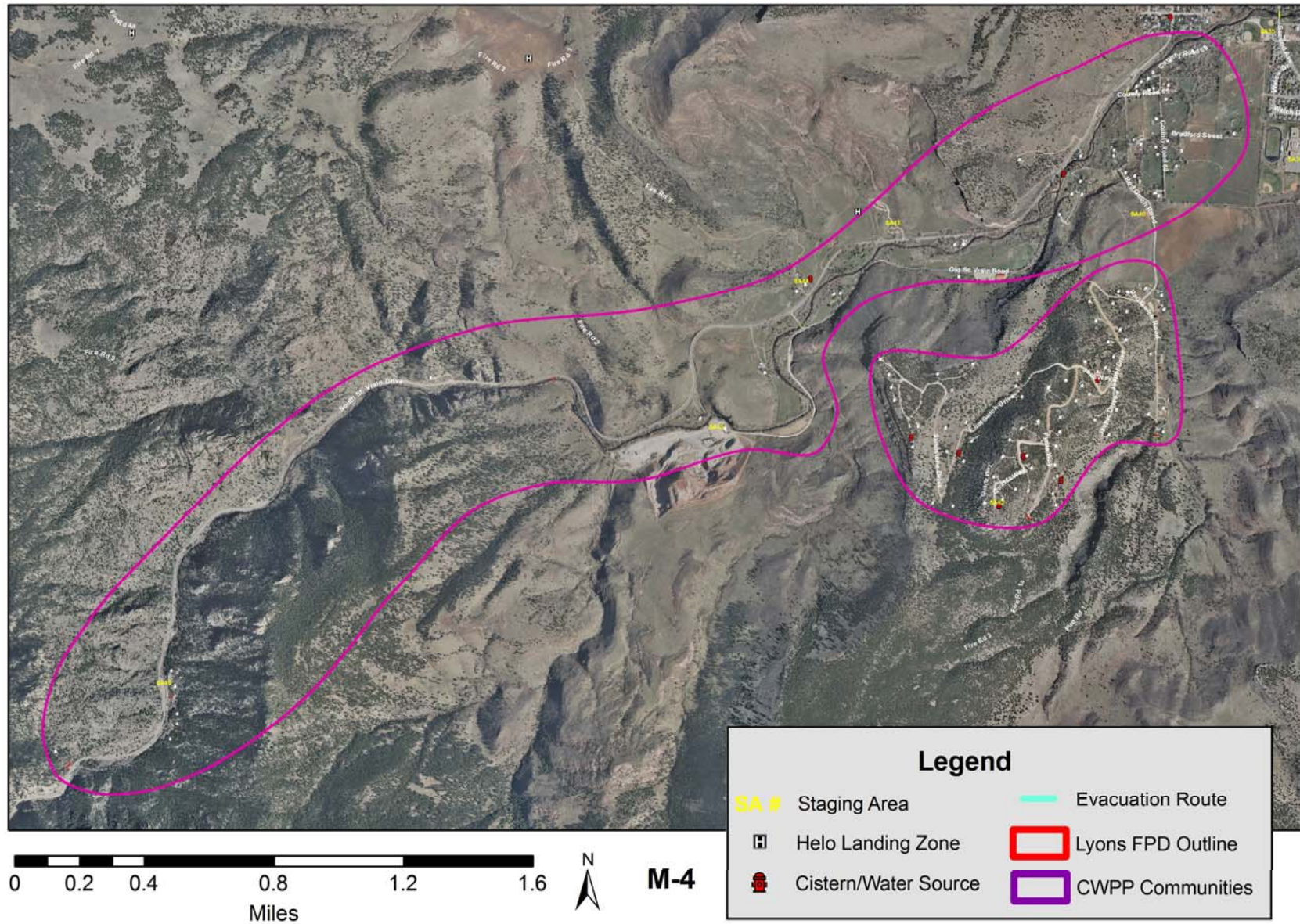
Homeowners improve defensible space and Firewise maintenance.

Owners with locked gates install Knox box or provide gate codes to fire department.

Wildfire Risk and Hazard Severity Assessment		
Neighborhood: South St Vrain		
Neighborhood Rating: Moderate		
Number of Houses: 38		
Means of Access to Neighborhood		
Fire Department Response Time	Most 5-10 minutes	3
Ingress and Egress	Most have 2 ways in/out	0
Road Width	> 24 Feet	0
Road Condition	Most Paved, State or County Maintained, <5% grade	0
Fire Service Access		0
Street Signs	1 Missing (Bradford)	1
Vegetation Along Access Route	Several Areas Require Mitigation	5
Other Access Hazards	3 Houses with unrated bridge	2
Below Items were evaluated for each house, then averaged for the neighborhood:		
Vegetation (Fire Behavior Fuel Models)		
Fuel Models Ag, 8, 9 & 10	Agricultural or closed crown deciduous	8.4
Defensible Space Mitigation		
Zone 1: within 30 ft	Good level of mitigation	5.9
Zone 2: 30 – 100 ft	Some mitigation	3.4
Zone 3: beyond 100 ft	Minimal mitigation	2.2
Topography		
Slope	Average 13, mostly flat except Southernmost	3.1
Building Setback	Several at bottom of steep slopes	3.1
Hazardous Topography		0
Firefighter Access		
Address Visible	Most Non-reflective, several not visible	2.5
Driveway Length	Most < 100 feet	1.1
Turnaround for Engine	Most OK or N/A	1.2
Driveway Clearance for Engine	Most OK or N/A	.7
Building Construction		
Roofing Material	Predominantly Asphalt, 1 with wood shakes	.7
Siding	Predominantly Wood	6.7
Decks	A few wood decks	1
Combustibles within 30 feet	Several problem areas	4.4
Firefighting Water Availability		
Cisterns	Severely Insufficient, only 1 Cistern Located, River drafting may be possible	9.9
Utility Hazards		
Aboveground Gas or Propane	none	0
Aboveground Electric Wires	About half	1
Neighborhood Total		66.3

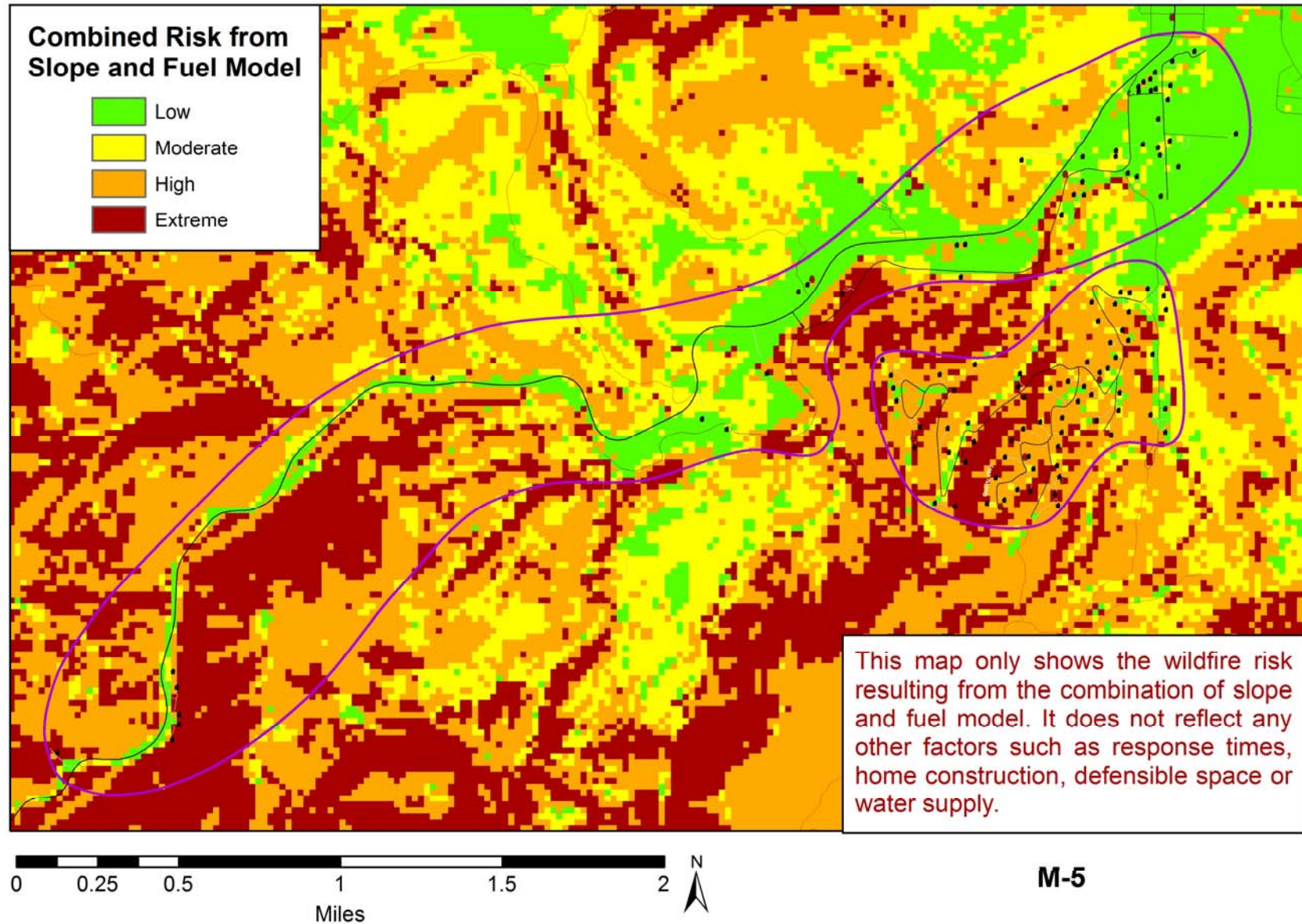
CWPP Community: South St Vrain

Wildfire Risk: Moderate



CWPP Community: South St Vrain

Wildfire Risk: Moderate



APPENDIX N

APPLE VALLEY

DETAILED COMMUNITY ASSESSMENT RESULTS

Overall Risk Assessment: **Moderate**
(**Antelope Ridge, Apple Ridge and Indian Lookout are High**)

Houses: 129

Description: The Apple Valley Community is primarily located along the shores of the North St. Vrain Creek on Apple Valley Road and North St Vrain Highway (US 36). This valley is well irrigated, with agricultural lands and heavy deciduous vegetation. The community also includes the surrounding foothills areas of Indian Lookout Mountain, Antelope Ridge, and Apple Ridge, which are drier with native brush and ponderosa vegetation. The neighborhood is bordered by steep cliffs (rising above the valley) on portions to the south and east; Hall Ranch Boulder County Open Space to the south and west, Boulder County Open Space to the north, and the town of Lyons to the east.

Average Lot Size: Less than 5 acres (varies from less than 1 to 35 acres).

Access Ingress/Egress, Response Time: Most of the area has from two directions along paved roads, Apple Valley Road or North St Vrain Drive, with a response time of less than 10 minutes. However, outlying areas are accessed by steep, narrow, graded dirt roads with single ingress/egress and insufficient pullouts, with response times up to 20 minutes. Many addresses are not visible from the road.

Predominant Fuel Model: Irrigated Agricultural land, heavy deciduous trees (Fuel Models 8 and 9) in the valley and along the river. Outer areas have native grass, brush, and open crown ponderosa (fuel models 2, 5, and 8).

Terrain/Topography: Generally fairly flat, with the exception of the surrounding foothills.

Home Construction: Several homes have wood shake shingles. Most other roofs are asphalt, some metal. Most homes are wood sided or heavy timber. Several homes have wood decks.

Defensible Space: Homeowners need to be reminded that in deciduous areas, annual maintenance is required. Once leaves have fallen, mitigation in the form of raking and removal of dried leaves and branches is required. Several homes have large amounts of flammable materials located within 30 feet of the home.

Water Supply: Nearly half the houses are served by fire hydrants. However, of the remainder, only a couple of cisterns were identified, which would require shuttling of water tenders a short distance (generally less than ½ mile other than Apple Ridge and Indian Lookout Mountain).

Special Hazards: Electric power lines repeatedly cross roads.

Issues:

Insufficient defensible space.

Ingress/egress concerns on Indian Lookout Mountain due to narrow road with encroaching vegetation roads.

Insufficient turnarounds and pullouts on Apple Ridge Road and Indian Lookout Mountain.

Recommendations:

Install turnarounds and pullouts on Indian Lookout Mountain and Apple Ridge Road.

Homeowners improve defensible space and Firewise maintenance.

Homeowners ensure address signs are visible from the road from both directions.

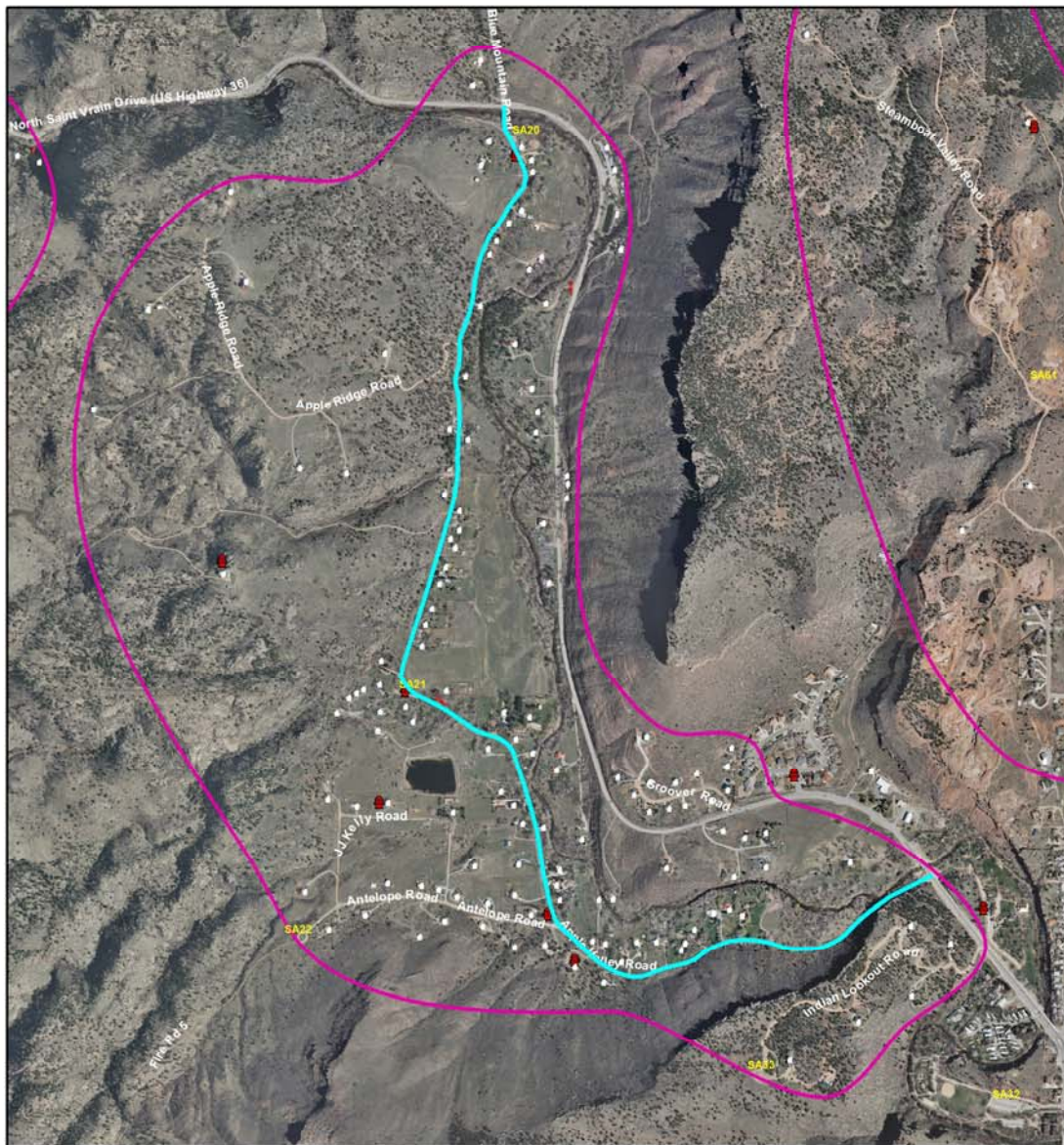
Mitigation project along Indian Lookout Mountain.

Wildfire Risk and Hazard Severity Assessment		
Neighborhood: Apple Valley		
Neighborhood Rating: Moderate		
Number of Houses: 129		
Means of Access to Neighborhood		
Fire Department Response Time	10-20 Minutes	6
Ingress and Egress	Most have 2 Accesses	3
Road Width	Most > 24 Feet	0
Road Condition	Most Paved, < 5% grade	2
Fire Service Access	No Issues	0
Street Signs	No Problems	0
Vegetation Along Access Route	Several Areas Require Mitigation	5
Other Access Hazards	Electric Wires Repeatedly Cross Above Road	2
Below Items were evaluated for each house, then averaged for the neighborhood:		
Vegetation (Fire Behavior Fuel Models)		
Fuel Models Ag, 8 & 9	Most Agricultural, heavy closed crown deciduous	6.2
Defensible Space Mitigation		
Zone 1: within 30 ft	Partial mitigation	7.9
Zone 2: 30 – 100 ft	Minimal mitigation	3.9
Zone 3: beyond 100 ft	Partial mitigation	1.1
Topography		
Slope	Average 11%	2.9
Building Setback	Minor issues	0.6
Hazardous Topography	None	0.1
Firefighter Access		
Address Visible	Most Non-reflective, a few not visible	1.4
Driveway Length	Most < 300 feet	1.1
Turnaround for Engine	Most OK or N/A	0.4
Driveway Clearance for Engine	Most OK or N/A	0.2
Building Construction		
Roofing Material	Predominantly Asphalt, 8 with wood shakes	1.6
Siding	Predominantly Wood	5.2
Decks	Several wood decks	1.4
Combustibles within 30 feet	Several problem areas	2.3
Firefighting Water Availability		
Cisterns	Nearly half served by hydrants, few cisterns	5.5
Utility Hazards		
Aboveground Gas or Propane	Isolated Propane tanks	0.1
Aboveground Electric Wires	Most	1.6
Neighborhood Total		57.5

CWPP Community: Apple Valley

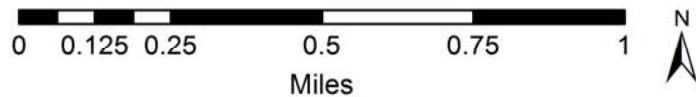
Wildfire Risk: Moderate

Apple Ridge &
Indian Lookout Road
Risk: High



Legend

-  Evacuation Route
- Staging Area
-  Helo Landing Zone
-  Cistern/Water Source
-  CWPP Communities



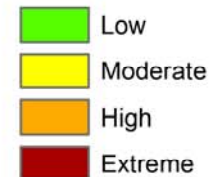
N-4

CWPP Community: Apple Valley

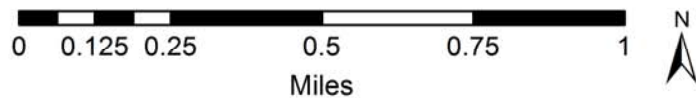
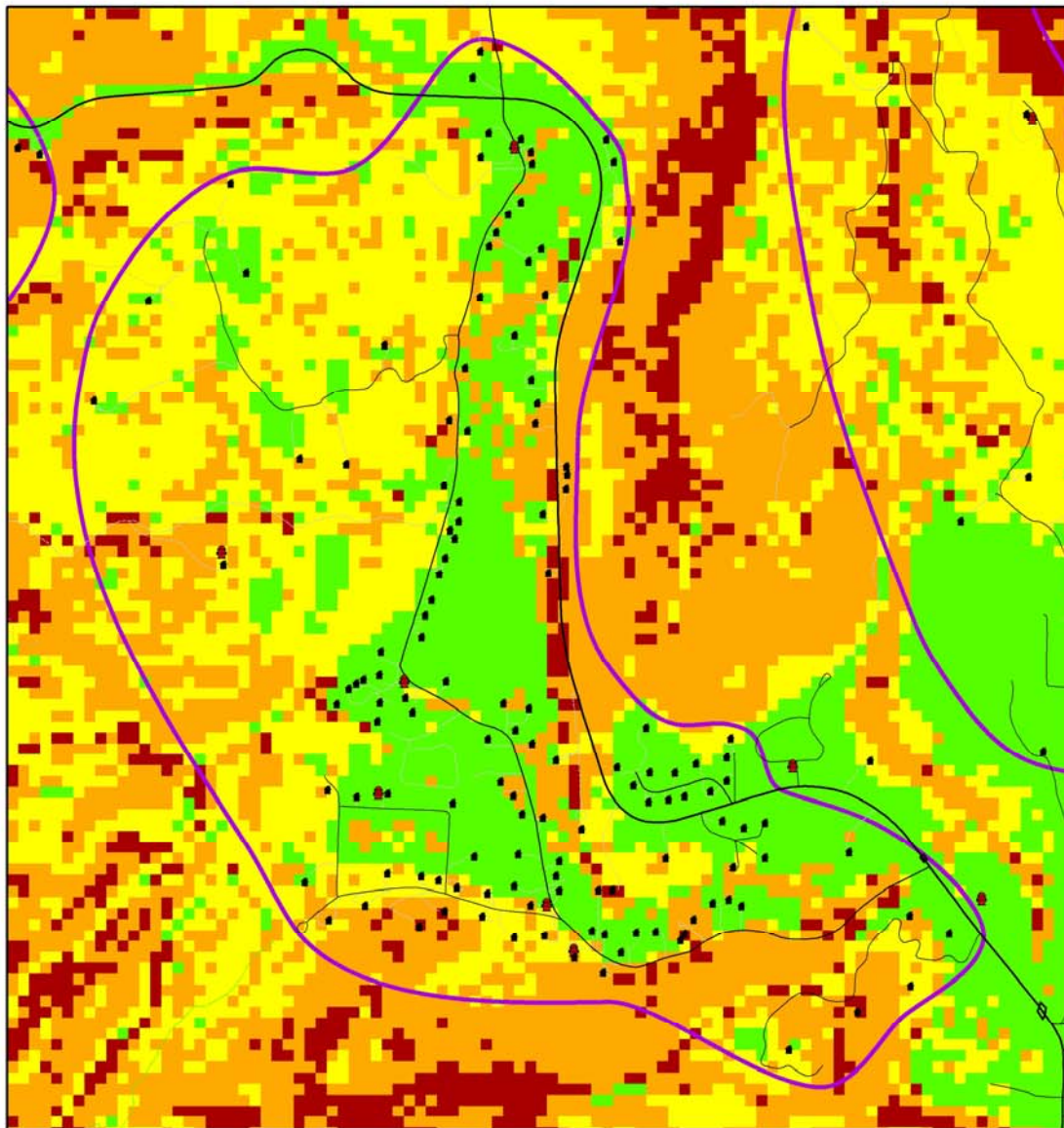
Wildfire Risk: Moderate

Apple Ridge &
Indian Lookout Road
Risk: High

Combined Risk from Slope and Fuel Model



This map only shows the wildfire risk resulting from the combination of slope and fuel model. It does not reflect any other factors such as response times, home construction, defensible space or water supply.



N-5

APPENDIX O

TOWN OF LYONS (NEW DEVELOPMENTS) DETAILED COMMUNITY ASSESSMENT RESULTS

Overall Risk Assessment: **Moderate**

Houses: 346

Description: Includes the developments of Eagle Canyon, Lyons Valley Park, Stone Canyon, Sierra Roja (Vasquez Court), Turner & Reed (First Ave), Mountain View, and portions of Steamboat Valley (Vasquez Rd, Horizon Dr, 1001-1020 Steamboat Valley Rd). These developments were recently built over the last 12 years or so, in valleys around the periphery of Lyons and annexed into the town. These developments generally abut the town of Lyons on at least one side and are surrounded by open space on the perimeters. Individual houses were not assessed, predominant conditions were evaluated.

Average Lot Size: less than ¼ acre.

Access Ingress/Egress, Response Time: Streets are all paved, town maintained, at least 20 ft wide, only a couple of grades >5%. Fire department response time averages 5-10 minutes from Station 1. Most have more than one ingress/egress, 20% have only one access. Street signs and house numbers are visible.

Predominant Fuel Model: Urban, surrounded by grass and brush (fuel models 2 and 5). A grass fire travels quickly and could approach these developments in a matter of minutes with little or no warning.

Terrain/Topography: generally flat, or less than 10%, but some bordered by steep cliffs.

Home Construction: These homes were predominantly built since the late 1990's, under building codes which incorporated more fire resistant construction methods. Some homes have wood siding, but most tend to be stucco or cement panel. There are no shake roofs, they are predominantly asphalt. Many homes have decks built of composite materials, but are open underneath.

Defensible Space: Defensible space was incorporated into the construction of these homes, but it is critical that it be maintained, especially around the fringes of these developments as they transition to open space. In several areas, tall grass adjacent to wood fences which are attached to houses provide a path for an open space grass fire to spread to houses. Other wood accessory structures are common. Also, the density of structures means that a fire in one house could easily spread to those adjacent. Most of these houses have plantings in zone 1. Plantings and lawns must be watered to maintain a green zone, and kept well-mown. Dead leaves and branches must be removed. Where applicable, homeowners associations should mow or weed whack common areas. Do not stow flammable materials under the deck.

Water Supply: Excellent, all houses are on town hydrant system.

Special Hazards: None noted

Issues:

Encroaching vegetation from open space.

Recommendations:

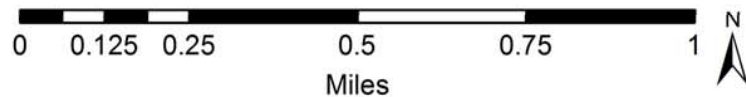
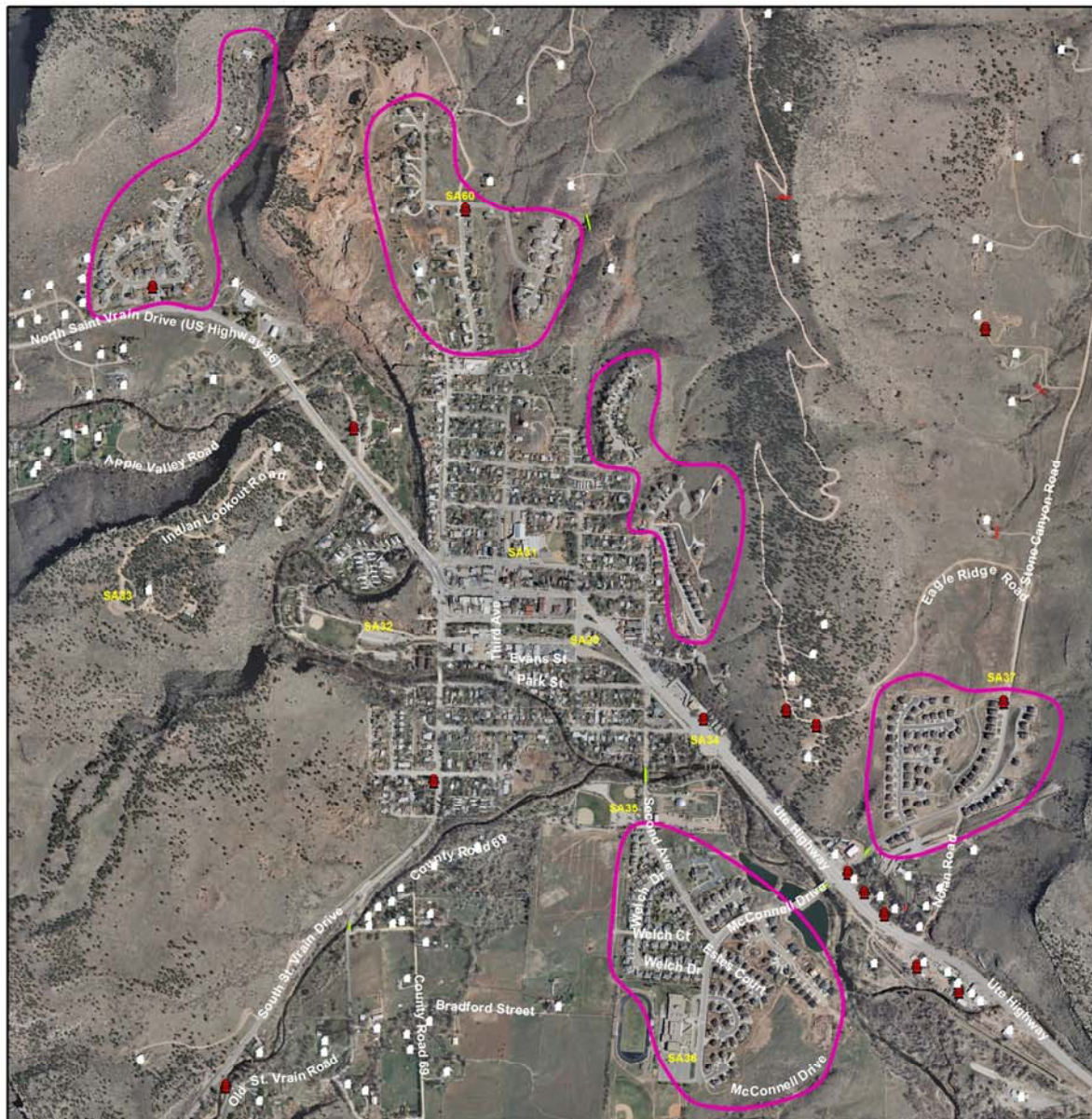
Homeowners need to improve and maintain defensible space. HOAs mow/maintain perimeter open space where applicable.

Town of Lyons conduct annual hydrant testing.

Wildfire Risk and Hazard Severity Assessment		
Neighborhood: Town of Lyons (New Developments)		
Neighborhood Rating: Moderate		
Number of Houses: 346		
Means of Access to Neighborhood		
Fire Department Response Time	10 minutes or less	3
Ingress and Egress	Most 2 or more accesses, 20% only one access	1.4
Road Width	> 20 ft	1
Road Condition	Paved, Town maintained, <5% grade	0
Fire Service Access	No issues	0
Street Signs	No issues	0
Vegetation Along Access Route	No issues	0
Other Access Hazards	No issues	0
Below Items were evaluated for each house, then averaged for the neighborhood:		
Vegetation (Fire Behavior Fuel Models)		
Fuel Models: Urban, 2 & 5	Urban, surrounded by mostly grass, some brush	4
Defensible Space Mitigation		
Zone 1: within 30 ft	Some mitigation	12
Zone 2: 30 – 100 ft	Some mitigation	3
Zone 3: beyond 100 ft	Minimal mitigation	1
Topography		
Slope	Less than 10%	1
Building Setback	NA	0
Hazardous Topography	NA	0
Firefighter Access		
Address Visible	Good but not reflective	1
Driveway Length	Most < 100 feet	0
Turnaround for Engine	Most OK or N/A	0
Driveway Clearance for Engine	Most OK or N/A	0
Building Construction		
Roofing Material	Predominantly Asphalt, no wood shakes	0
Siding	Wood, stucco or cement panel	4
Decks	Many composite decks, mostly open	5
Combustibles within 30 feet	Numerous fences and other wood structures	5
Firefighting Water Availability		
Hydrants	Excellent, all served by town hydrants	0
Utility Hazards		
Aboveground Gas or Propane	None	0
Aboveground Electric Wires	None	0
Neighborhood Total		41.4

CWPP Community: Town of Lyons New Developments

Wildfire Risk: Moderate



Legend

- SA # Staging Area
- H Helo Landing Zone
-  Cistern/Water Source
- Lyons FPD Outline
- Lyons New Devel

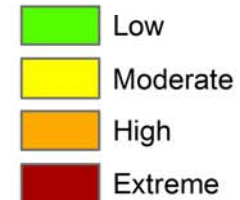
O-4

CWPP Community: Town of Lyons New Developments

Wildfire Risk: Moderate

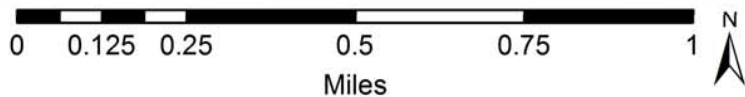
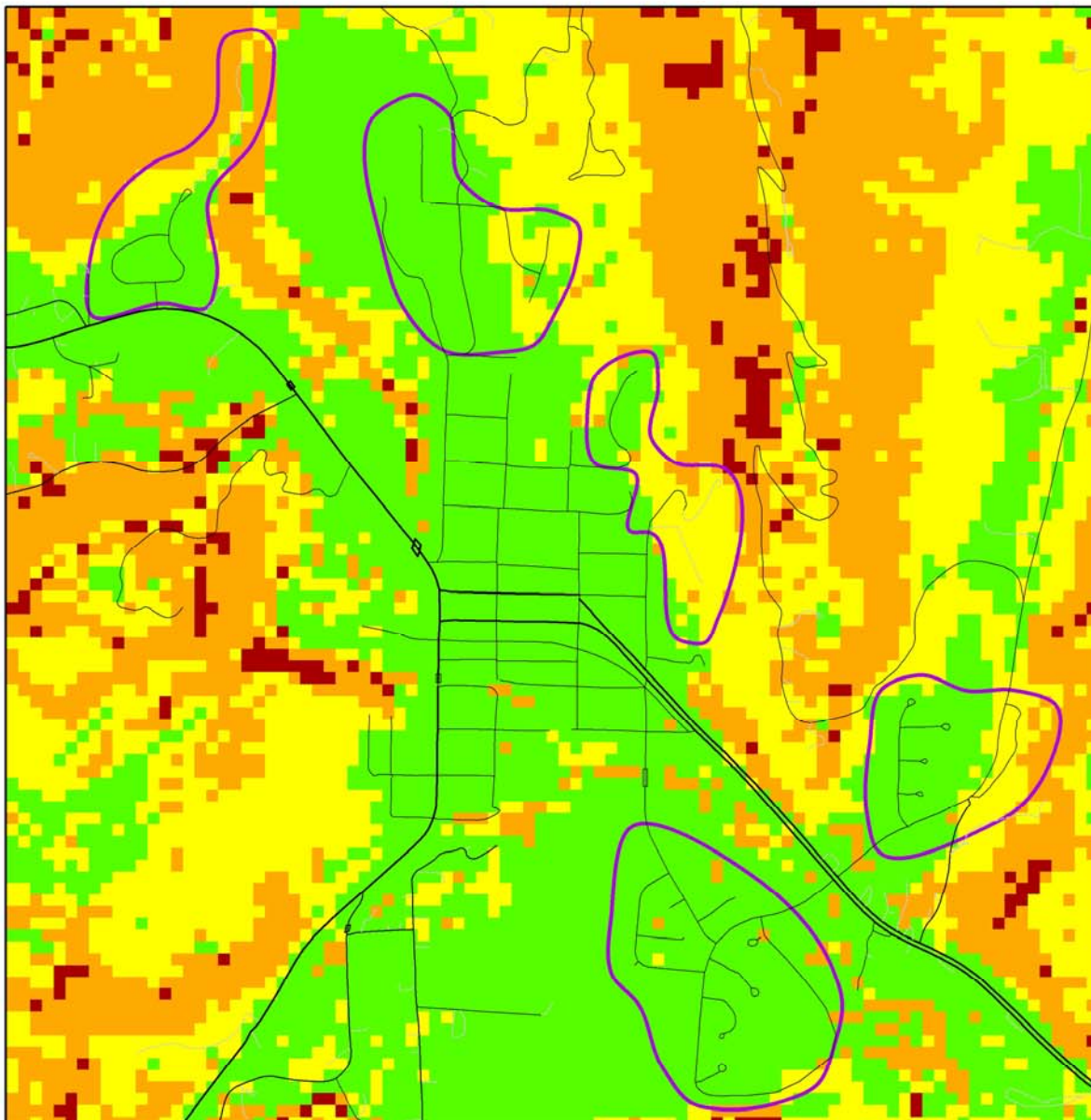
Combined Risk from Slope and Fuel Model

Wildfire Risk



This map only shows the wildfire risk resulting from the combination of slope and fuel model. It does not reflect any other factors such as response times, home construction, defensible space or water supply.

O-5



APPENDIX P

REFERENCES

Aids to Determining Fuel Models for Estimating Fire Behavior, USDA Forest Service General Technical Report INT-122, by Hal E Anderson, April 1982:

<http://www.doeal.gov/SWEIS/OtherDocuments/477%20anderson1982.pdf>

Colorado State Forest Service Minimum Standards for Community Wildfire Protection Plans, November 2009:

http://csfs.colostate.edu/pdfs/FINAL_Revised_CWPP_Minimum_Standards_111309.pdf

Community Wildfire Protection Planning, Colorado State Forest Service website:

<http://csfs.colostate.edu/pages/community-wf-protection-planning.html>.

CWPP Handbook, Colorado State Forest Service, (2004):

<http://csfs.colostate.edu/pdfs/cwpphandbook.pdf>

Establishment of Community Wildfire Protection Plans by County Governments, Colorado Senate Bill 09-001:

http://www.leg.state.co.us/clics/clics2009a/csl.nsf/fsbillcont3/07E36F303FBFAA1E87257537001DADA9?open&file=001_enr.pdf

Firewise. Internet access: <http://www.firewise.org/>

Healthy Forests Restoration Act of 2003; Public Law 108-148; Sec. 103:

http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=108_cong_bills&docid=f:h1904enr.txt.pdf

LANDFIRE (Landscape Fire and Resource Management Planning Tools): www.landfire.gov

Lessons Learned In Colorado: The Community Wildfire Protection Plan Process

By John Chapman, CWPP Coordinator, Southern Rockies Conservation Alliance (2008)

Standard for Protection of Life and Property from Wildfire, National Fire Protection Authority (NFPA) 1144, 2002.