Town of Larkspur
Community Wildfire Protection Plan

August 19, 2021

Prepared By

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Forestree Development, LLC

And

Town of Larkspur
Larkspur Fire Protection District
Douglas County Sheriff Office of Emergency Management

In Cooperation With:
Colorado State Forest Service

ACCEPTANCE

The Town of Larkspur (TOL) Community Wildfire Protection Plan (CWPP) was developed in accordance with the guidelines set forth by the Healthy Forests Restoration Act of 2003 and the Colorado State Forest Services' Minimum Standards for CWPP's.

This CWPP is a collaborative effort to guide the Larkspur Fire Protection District (District) and Town of Larkspur stewardship management activities, including wildfire protection. The activities recommended in this plan are appropriate to meet TOL and District objectives and will benefit the natural resources and reduce the risk from wildland fire. This plan is voluntary, and where possible, TOL and the District intend to apply the recommended practices, thus improving community preparedness, and increasing public safety.

The CWPP has been reviewed and approved by the Town of Larkspur CWPP Core Team.

_____	8/31/2021
Mayor Town of Larkspur	Date
_____	8/30/21
Fire Chief Larkspur Fire Protection District	Date
_____	8/30/21
Meg Halford, Supervisory Forester Colorado State Forest Service	Date

Town of LARKSPUR
Colorado

RESOLUTION NO. 2021-13

A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF LARKSPUR ADOPTING THE TOWN OF LARKSPUR COMMUNITY WILDFIRE PROTECTION PLAN IN AND FOR THE TOWN OF LARKSPUR, COLORADO

WHEREAS, wildfire is an ever-increasing concern for many communities in Colorado and across the United States; and

WHEREAS, in recent years, there have been a number of significant wildfires in the local region near Larkspur, as well as in Colorado and other areas of the United States, that have resulted in the loss of homes and lives; and

WHEREAS, the cost to suppress wildfires across the United States typically exceeds one billion dollars annually; and

WHEREAS, Larkspur Fire Protection District prepared a Community Wildfire Protection Plan (CWPP) for the Town of Larkspur, served by the Larkspur Fire Protection District, including Larkspur and areas around the Town in cooperation with the Colorado State Forest Service and Town staff; and

WHEREAS, the CWPP's primary goal is to protect human life and reduce property loss due to wildfire by identifying wildfire risk and mitigation measures in the Wildland Urban Interface (WUI) areas, the zones most at risk for wildfire, of the Larkspur Fire Protection District service area; and

WHEREAS, the CWPP is a strategic plan with goals for creating a safer wildland urban interface community; and

WHEREAS, the CWPP was developed in collaboration with the jurisdictions served by Larkspur Fire Protection District, wildfire professionals and non-profits in Douglas County, and the Douglas County Sheriff's Office; and

WHEREAS, Larkspur Fire Protection District also conducted a series of community workshops and solicited community input on the development of the plan, including identification of hazards and potential mitigation measures; and

WHEREAS, the Town of Larkspur CWPP includes annexes that address specific issues and projects to address these risks by jurisdictions in the Larkspur Fire Protection District service area; and

WHEREAS, the Town of Larkspur desires the CWPP to serve as the Town of Larkspur's CWPP.

Town of LARKSPUR
Colorado

NOW, THEREFORE BE IT RESOLVED, that the City Council of the Town of Larkspur does hereby adopt the Town of Larkspurs Community Wildfire Protection Plan.

INTRODUCED, PASSED AND ADOPTED AT A SPECIAL MEETING OF THE TOWN COUNCIL OF THE TOWN OF LARKSPUR THIS 19th DAY OF AUGUST 2021.

Votes Approved: 6
Votes Opposed: 0
Abstained: 0
Absent: 1

TOWN OF LARKSPUR ★ OFFICAL SEAL ★ STATE OF COLORADO

ATTEST:

Sean Hogan
Town Clerk

TOWN COUNCIL OF THE TOWN OF LARKSPUR, COLORADO

Isaac Levy
Mayor

Town of Larkspur CWPP Updates/Amendments		
Change	**Date**	**Comments**
Draft 2	**8-4-21**	**Approved at Core Team meeting,**
Final Plan	**8-19-21**	**Approved by Resolution at Larkspur Council Meeting**

NOTE: Amendments to this plan must be approved by Colorado State Forest Service and Larkspur Fire Protection District.

Forward

The experience of the last several fire seasons, sustained drought conditions, disease and the ever-increasing number of homes constructed in the Wildland-Urban Interface (WUI) make future wildfires in the Larkspur Fire Protection District (District) and Town of Larkspur (TOL) a near certainty. All residents and property owners of the town have a personal responsibility to understand the linkage between forest stewardship, their personal safety, that of their neighbors and our firefighters.

With future fires a certainty, it is vitally important that each individual home and property owner understand and apply principles and guidelines in the Colorado State Forest Service Publication, (Updated 2021): *The Home Ignition Zone: A Guide to Preparing Your Home for Wildfire and Creating Defensible-Space*, and other Firewise recommendations found at www.firewise.org. However, principles, standards and techniques in various wildfire publications are useless without a key factor: The human will to make a change in the WUI environment.

To make this change, three key principles can be examined: Community, Consensus, and Collaboration, or, the three C's.

Community:

- Responsibility- individual and collective.
- Entire areas mitigated and forests restored to healthy conditions.
- Overall reduction in fuel volumes.
- Risk management as opposed to an unrealistic expectation of risk elimination.

Consensus:

- Standards for fuel reduction intended to protect life, property and natural resources.
- Adoption of an overall Plan (CWPP) to address/manage wildfire risks.
- Breaking through deeply held cultural values and beliefs that prevent residents from becoming more adapted to fire as a natural part of the ecosystem.
- Definition of a healthy forest, using the best science available, and development of an acceptable "aesthetic" based on this science.
- Wildfires will happen. It is not a matter of "if", but "when".
- There are no guarantees with wildfire due to many variables; both human and natural.

Collaboration:

- Partnering with organizations that can have an impact on the life, property and natural resources of the County.
- Working together to take advantage of any outside financial assistance or programs to meet stated fuels modification.
- Empathy with different standards.
- Getting past "no" and/or willful ignorance.

The Three C's are vital to building common interest, understanding and action; and necessary to protect the values that make the study area unique.

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Appendices:

Introduction

The CWPP study area is based on “Landscape Neighborhoods” identified as Compartments 1 to 3. These areas have the potential to be impacted by wildfires. Three major wildfires have occurred within 30 miles of the Town. These were the Hayman Fire (2002), Waldo Canyon Fire (2012) and Black Forest Fire (2013). The fires burned with high intensity as crown fires and resulted in four deaths and significant property losses. These fires burned for extended periods of time and fire spread direction changed multiple times. The study area’s residents must continue to reduce their ladder fuels and increase tree crown separation to survive a high intensity wildfire that can come from any direction. Structures must be hardened to resist both embers and flames. Property owners should take advantage of any slash disposal programs.

The study area, in an effort to be proactive, has begun to implement fuel treatments in the surrounding area (Greater Larkspur project-which includes Perry Park Metro District, Haystack Ranch and Sandstone Open Space) under supervision of CSFS. The fire district has begun a free voluntary homeowner evaluation program within high-risk neighborhoods.

Objectives of the plan are:

- To protect life, property, and natural resources of the CWPP study area.
- To protect lifestyle and shared community values.
- Continue to identify values that need to be protected within the study area.
- To restore and protect the forests of the study area.
- To protect homeowner access to affordable insurance.
- To reduce wildfire risks in the Town.
- To develop partnerships (i.e., newly forming Douglas County Wildfire Partnership) for shared stewardship efforts, leveraging resources with those that can have an influence on the wildfire risk. To provide for the safety of firefighters and allow them to be more effective in protecting us.
- To collaborate with adjoining fire departments, Colorado State Forest Service, Douglas County Sheriff’s Office, and Douglas County to mitigate wildfire hazards on a landscape level.

The CWPP Process

The minimum requirements for a CWPP as described in the Healthy Forest Restoration Act of 2003 are:

1. **Collaboration**: A CWPP must be collaboratively developed by local and state government representatives, in consultation with federal agencies and other interested parties.

2. **Prioritized Fuel Reduction**: A CWPP must identify and prioritize areas for hazardous fuel reduction treatments and recommend the types and methods of treatment that will protect one or more at-risk communities and essential infrastructure.

3. **Treatment of Structural Ignitability**: A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan.[1]

The CWPP process will cover:

- **Assessment:**
  - Carry out a general community assessment and an analysis of community fire mitigation capacity;
- **Education and Preparedness:**
  - Develop community education and preparedness initiatives about wildfire behavior and mitigation;
- **Mitigation planning**
  - Engage in community wildfire mitigation planning;
- **Implementation**
  - Implement risk reduction and community protection activities;
- **Monitoring and Sustainability**
  - Commit to project implementation monitoring and building sustainable community capacity.

[1] Preparing a Community Wildfire Protection Plan, National Association of State Foresters, et al, March 2004.

COMMUNITY IDENTIFICATION AND DESCRIPTION

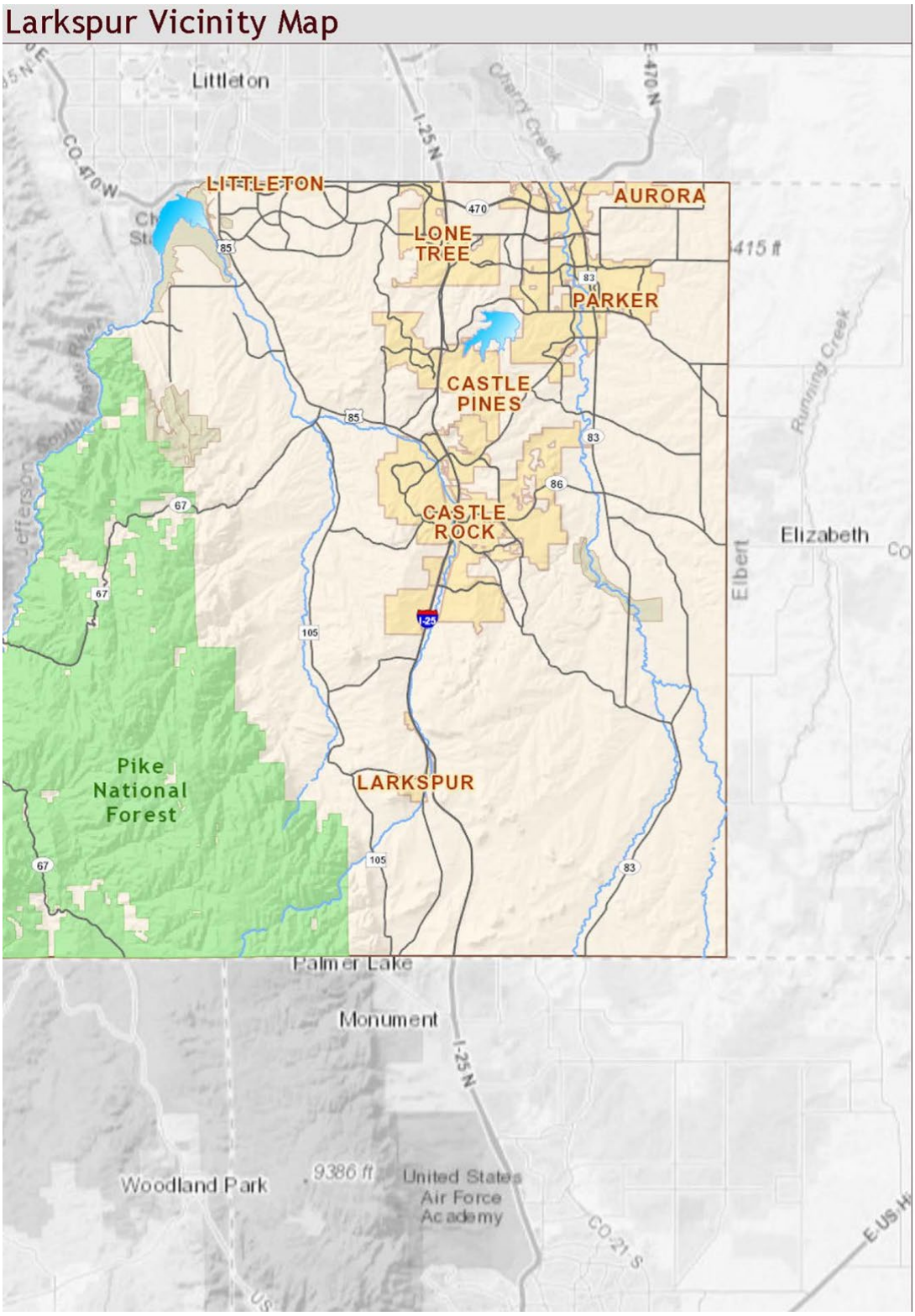
Location and General Description

The Town of Larkspur is a Home Rule town incorporated in 1979 under the Colorado Revised Statutes. Population is estimated at 211 people. It is governed by a Council/Mayor form of government with six elected councilmembers and elected mayor. Day-to-day operations are administered by a Town Clerk/Administrator.

The Town of Larkspur is in central Colorado within southern Douglas County. Larkspur is generally located 10 miles north of the Town of Monument and 10 miles south of the Town of Castle Rock. The Town is bisected by Colorado Highway 18 (Spruce Mountain Road) and abuts Interstate 25, which provides access to Colorado Springs and Denver.

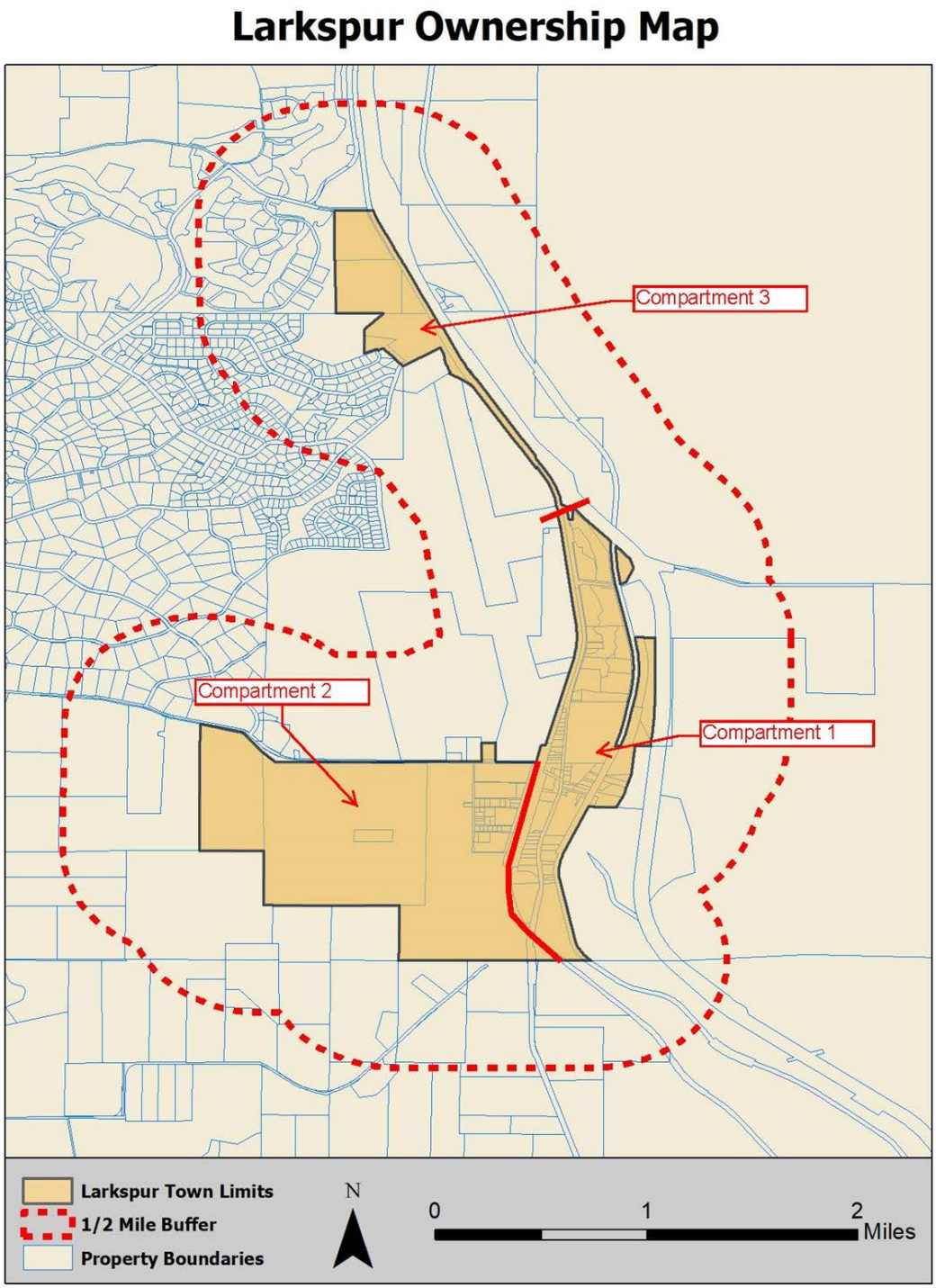
Town residents enjoy the availability of potable water through the Town's central water distribution system. Electric service is provided by Intermountain Rural Electric Association (IREA). Natural gas service is provided by Black Hills Energy. Telephone service is provided by Century Link Communications. The Town provided central sanitary sewage collection and treatment. The Town also provides street maintenance, park maintenance, and other general municipal services. Law enforcement is covered by the Douglas County Sheriff's Office (DCSO). Fire protection services are made available through the Larkspur Fire Protection District (LFPD).

The community is located within Sections 16, 21, 22, 27, 32 and 34, Township 9 South, Range 67 West of the 6th Principal Meridian.



Vicinity Map

The CWPP study area is the town limits of Larkspur, Colorado, and includes a one-half mile wide buffer around the town limits.



Map of the Town of Larkspur CWPP Study Area

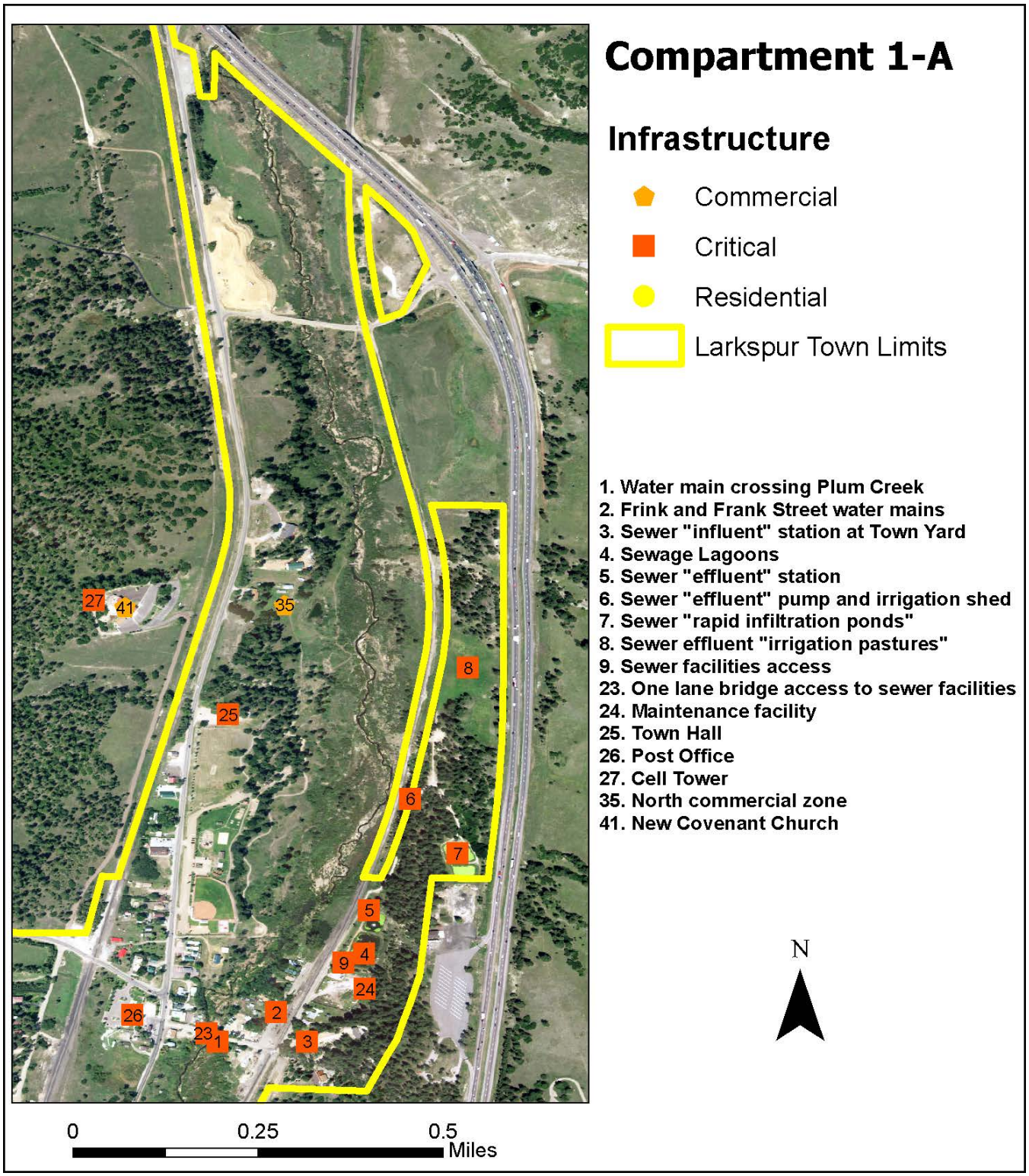
The town is surrounded by unincorporated Douglas County. The eastern boundary abuts Interstate Highway I-25.

The Town has been divided into three compartments requiring differing levels of wildfire mitigation.

Compartment 1

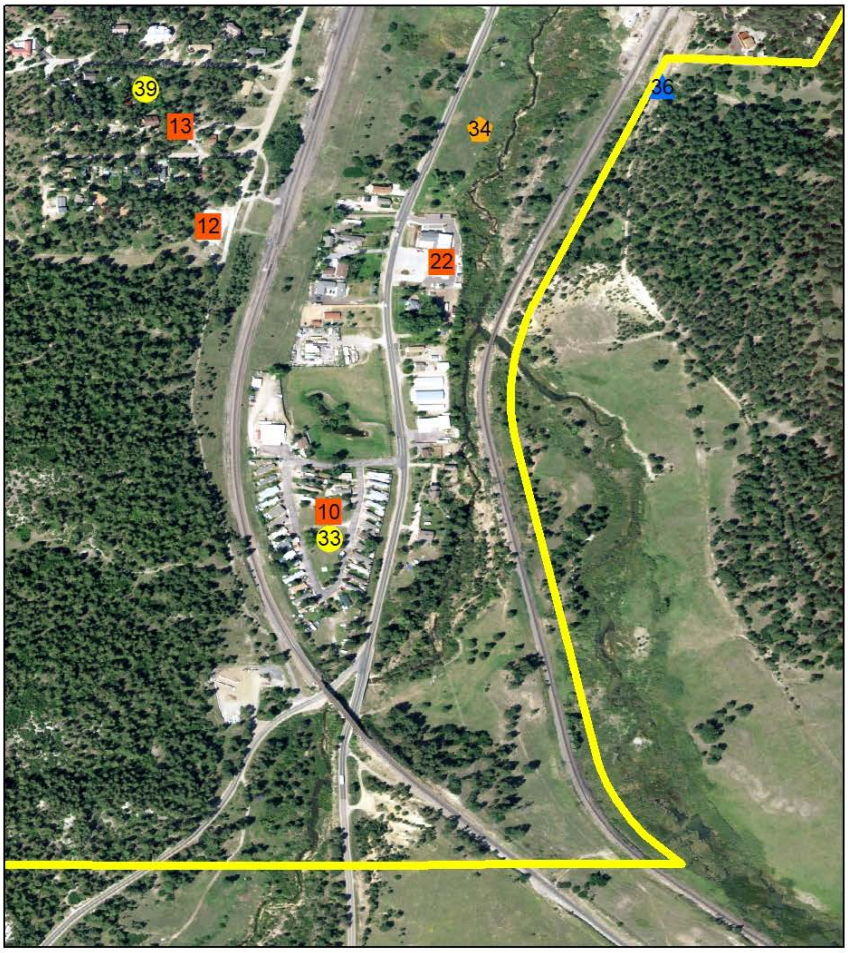
This compartment is the most developed area and encompasses the commercial properties along Spruce Mountain Road and most of the residential housing within the town. It also includes much of the critical infrastructure. Due to its length, it has been divided into Compartment 1A (north half) and Compartment 1B (south half).

Compartment 1A contains an 800 MHz communications tower (#27 on map below) that is critical for DCSO and LFPD communications during emergency situations.



Compartment 1A- North half of commercial district

Compartment 1-B



0 0.2 0.4 Miles

N

Infrastructure

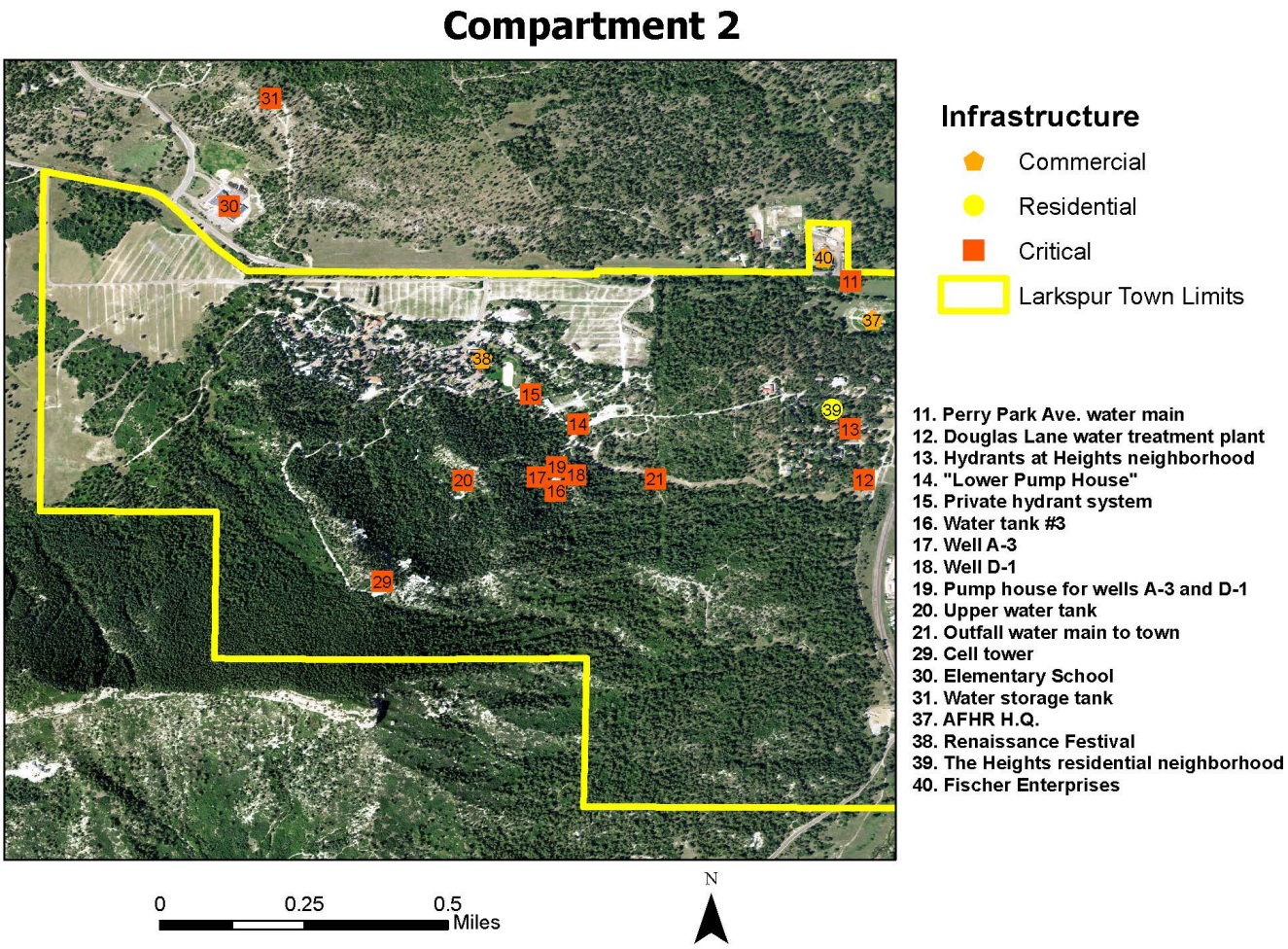
- Commercial
- Critical
- Non-critical
- Residential
- Larkspur Town Limits

10. Hydrants at mobile home park
12. Douglas Lane water treatment plant
13. Hydrants at Heights neighborhood
22. LFPD station 161
33. Larkspur Station mobile home park
34. South commercial zone
36. Douglas County trail head
39. The Heights residential neighborhood

Compartment 1B- South half of commercial district

Compartment 2

This compartment includes properties west of the railroad right-of-way. It contains heavy forest fuels or abuts zones with heavy fuels. Two high value assets are located in this compartment. The first is the Colorado Renaissance Festival (CRF) which yields a high percentage of the Town's sales tax revenue. The second is a telecommunication facility, with multiple towers, located on a high point south of the CRF site.

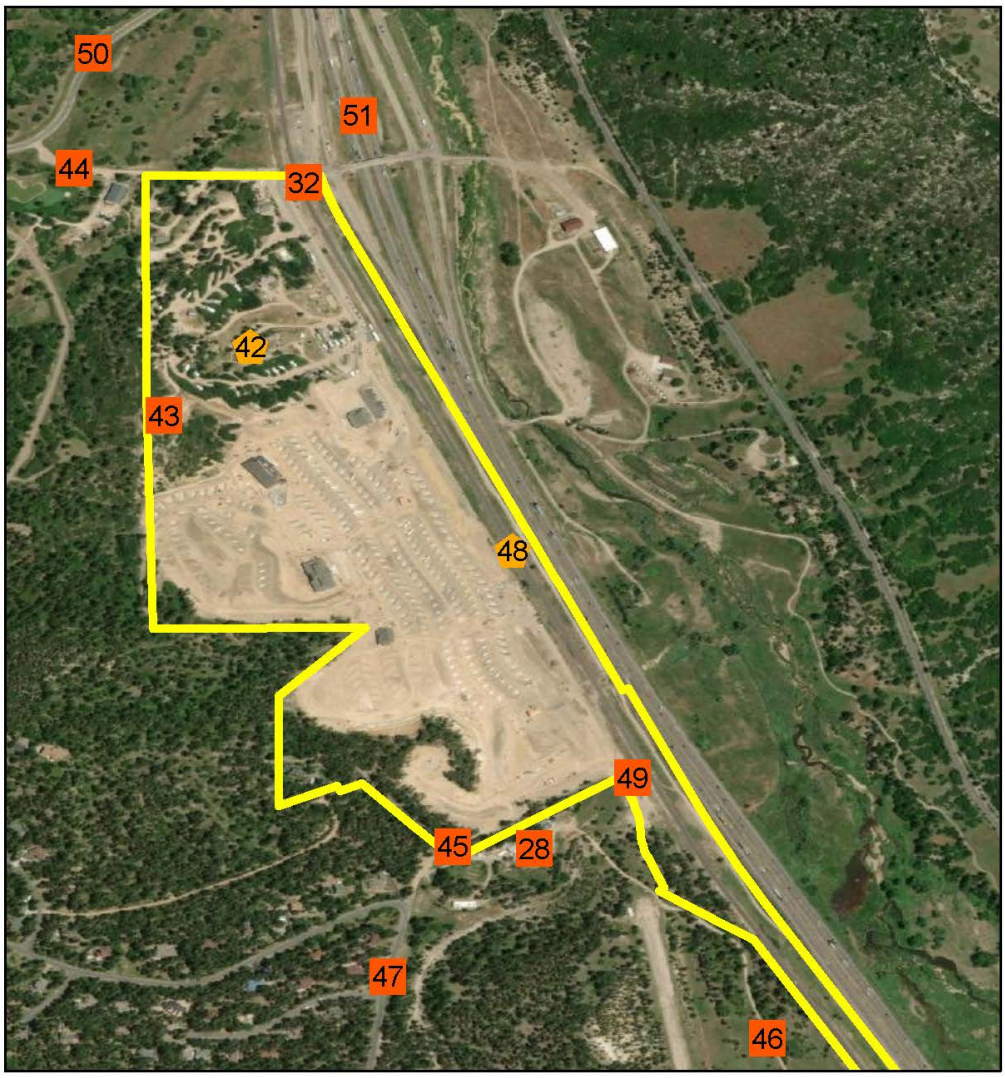


Compartment 2- West of railroad right-of-way

Compartment 3

This compartment primarily includes the Jellystone commercial district and Interstate I-25 frontage. The entire compartment has been completely graded and no longer contains its original native vegetation. It is a high-use recreation area.

Compartment 3



0 0.25 0.5 Miles

N

Infrastructure

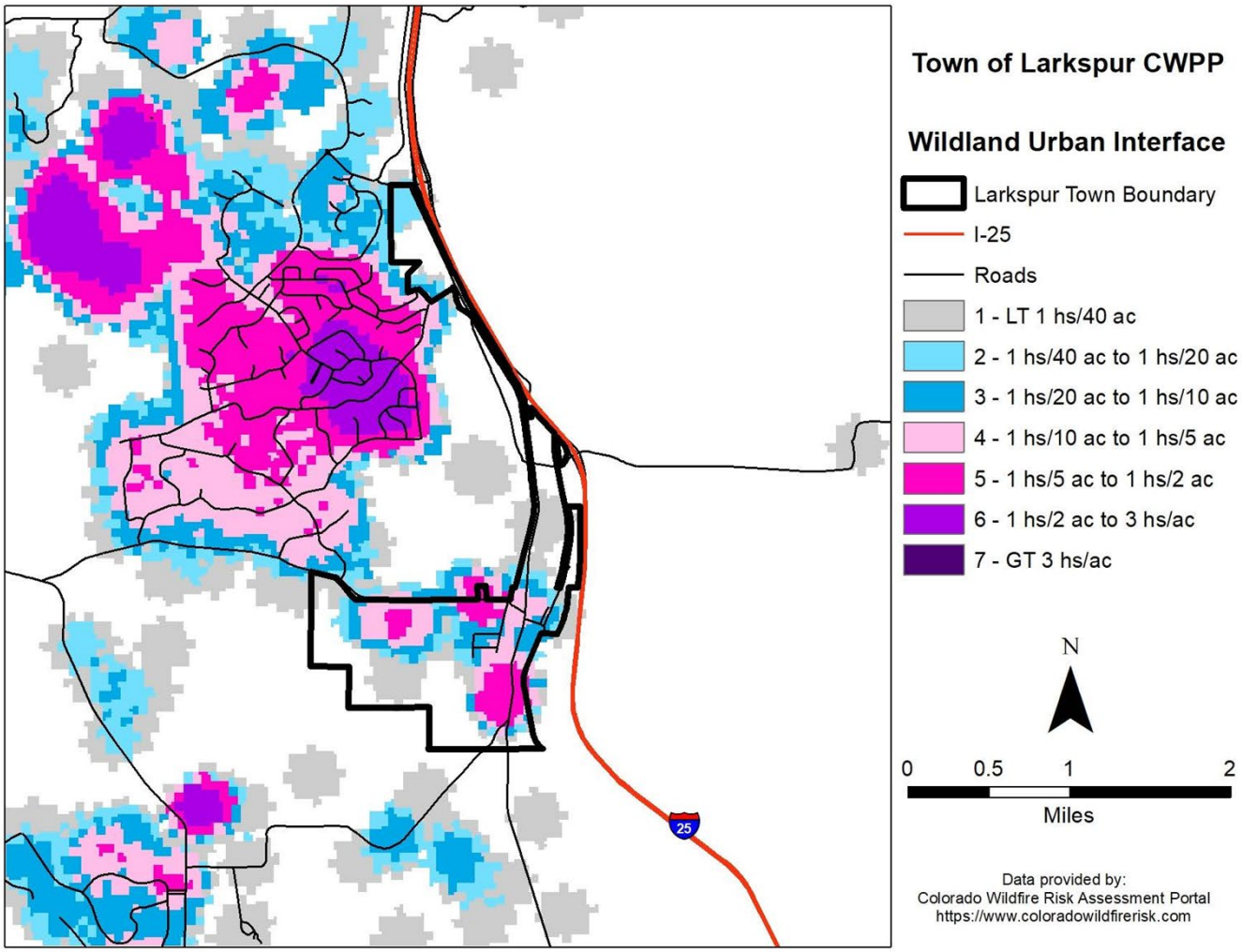
- Commercial
- Critical
- Larkspur Town Limits

28. PPWSD facility
32. I-25 interchange
42. Jellystone campground
43. 250k Water tank
44. Potential egress to Bear Dance Rd.
45. Egress to Tenderfoot Drive
46. Territorial Road
47. Tenderfoot Drive
48. Rail Road ROW
49. Egress to utility complex
50. Bear Dance Road
51. I-25 ROW

COMMUNITY ASSESSMENT

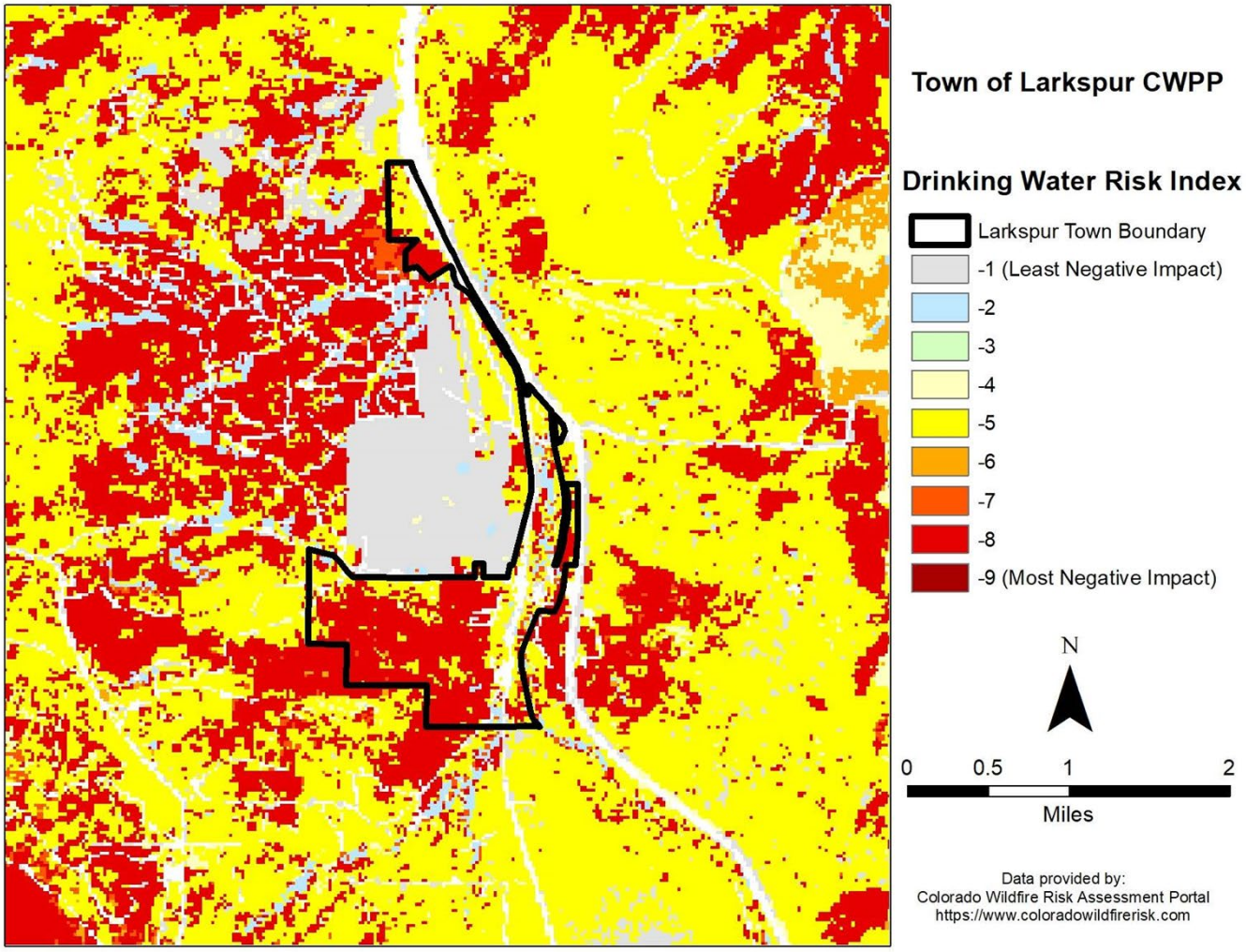
Community Values at Risk

The number one asset in the study area is the residential and commercial resource.[2] The surrounding forest is also of high value. This asset provides three main values. The first is the aesthetic value, which supports tourism in the area. The second value, property value, is directly related to lot costs and home resale values for forested properties. The third value is renewable water. Water, for domestic uses, is the most valuable resource from the watersheds south and west of the CWPP area. Other less tangible values include wildlife habitat, view corridors, and privacy.



Wildland Urban Interface ("hs/ac" = houses/structures per acres)

[2] CSFS Forest Atlas and CO-WRAP mapping tools used to generate risk maps.



Drinking Water Risk Index

Wildland Urban Interface Boundary

The wildland urban interface (WUI) boundary is defined as the area where a wildfire would be a threat to the community. The boundary, shown as a red dashed outlined area on the map on the following page, was set at the CWPP boundaries. Three zones have been identified. These are:

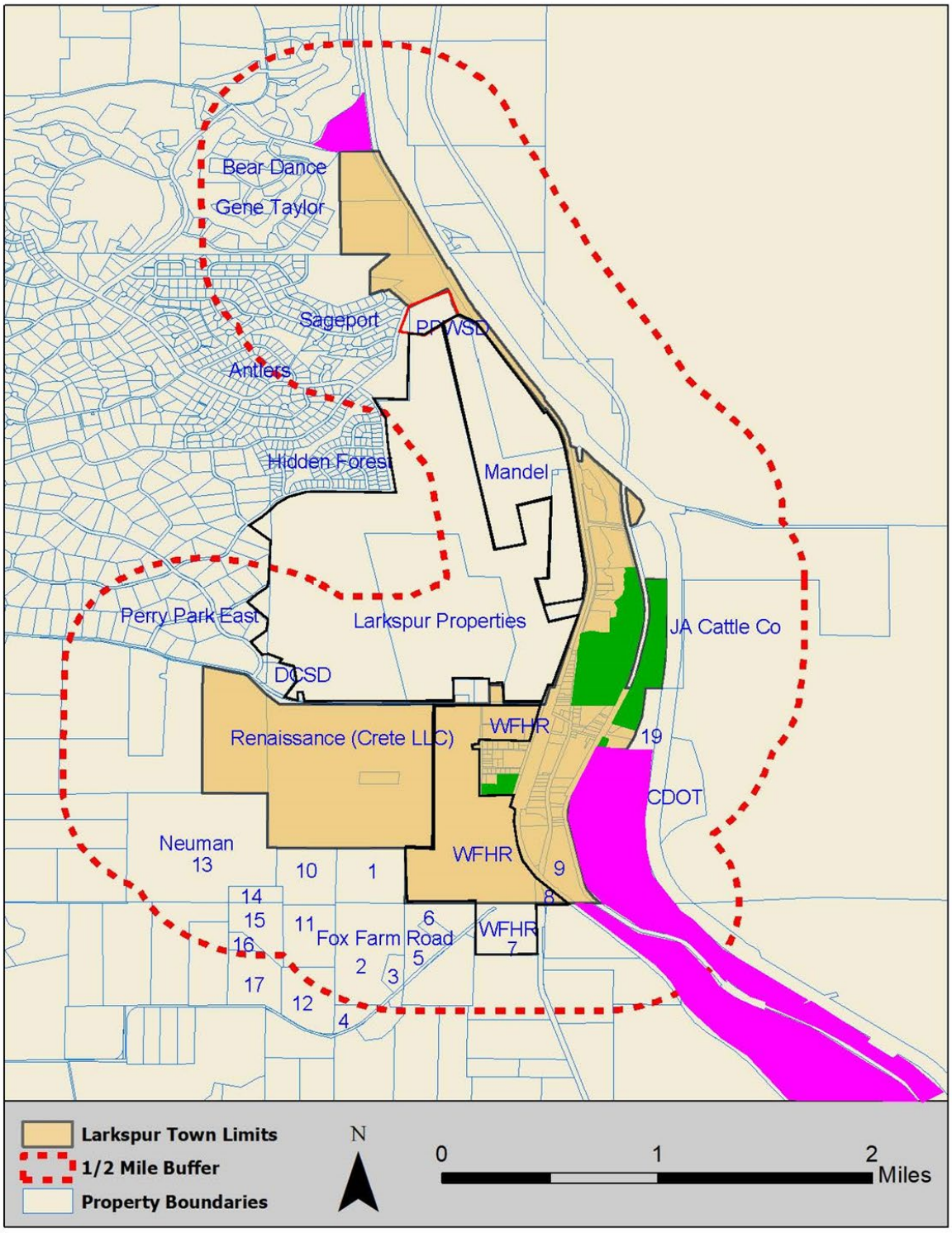
- Zone 1- Town boundary and communities within the study area.
- Zone 2- Wildfire impact areas abutting the Town, primarily lands where wildfire occurrence may have an immediate impact on the Town. A minimum ½ mile wide area will be a high priority for treatments due to potential crown fire spread and ember

outwash from this zone into the community. It should be noted that embers generated outside of the community can also impact residents.[3]

- Zone 3- Wildfire influence zone beyond ½ mile from the Town. Wildfires from this zone can exhibit extreme fire behavior that continues into zones 1 and 2, with little or no potential for containment or control.

[3] Framework for Addressing the NationalWildland Urban Interface Fire Problem – Determining Fire and Ember Exposure Zones using a WUI Hazard Scale, NIST Technical Note 1748, January 2013, A. Maranghides, W. Mell http://dx.doi.org/10.6028/NIST.TN.1748

Larkspur Ownership Map



Wildfire Risk and WUI Boundary (green= Town, magenta= DC)

In past fire seasons, normally ninety-eight percent of wildfires were typically contained or controlled within the first or second burning period.[4] The Hayman, Waldo Canyon and Black Forest Fires fit into the remaining two percent of fires that exceeded the suppression capacity of fire service control due to extreme weather and fuel conditions. Most of the homes and structures are lost during this "convergence of conditions" of fuel, weather, and topography within the first 24 hours of the fire.

The 2020 fire season called into question the 2% to 98% ratio due to decades-long drought. The Cameron Peak Fire, Troublesome Fire, Pine Gulch Fire, Calwood Fire and Grizzly Creek Fire were even more unprecedented in their behavior.

Other observations of the fuels in the CWPP are:

- Large, un-thinned, decadent forests will exacerbate fire behavior.
- Limited fuel treatments implemented by homeowners can be easily overwhelmed due to untreated fuels on surrounding properties.
- Unmitigated fuels on Douglas County or Colorado Department of Transportation properties can threaten civilian evacuation, and firefighter access and safety.
- Aerial resources may be unavailable, or of limited value for reducing rate of fire spread due to extreme fire behavior and high winds.
- Density of the tree canopy provides challenges for the effective placement of retardant by some of the delivery systems in use.

Wildfire Risk

Vegetation in the study area is dominated by a second-growth ponderosa pine, mixed-conifer forests with a high percentage of closed crowns, and dense pine, Douglas-fir or Gambel oak understory. Fuel models for this timber type are:

- FBO Fuel Models **1**and **9**[5]
- NFDRS Models **U** and **L**[6]

A high percentage of the area is covered by prairie fuels intermixed with low shrub species. Fuel models for these areas are:

- FBO Fuel Models **1** and **2**
- NFDRS Models **A**, **C**, **L** and **T**

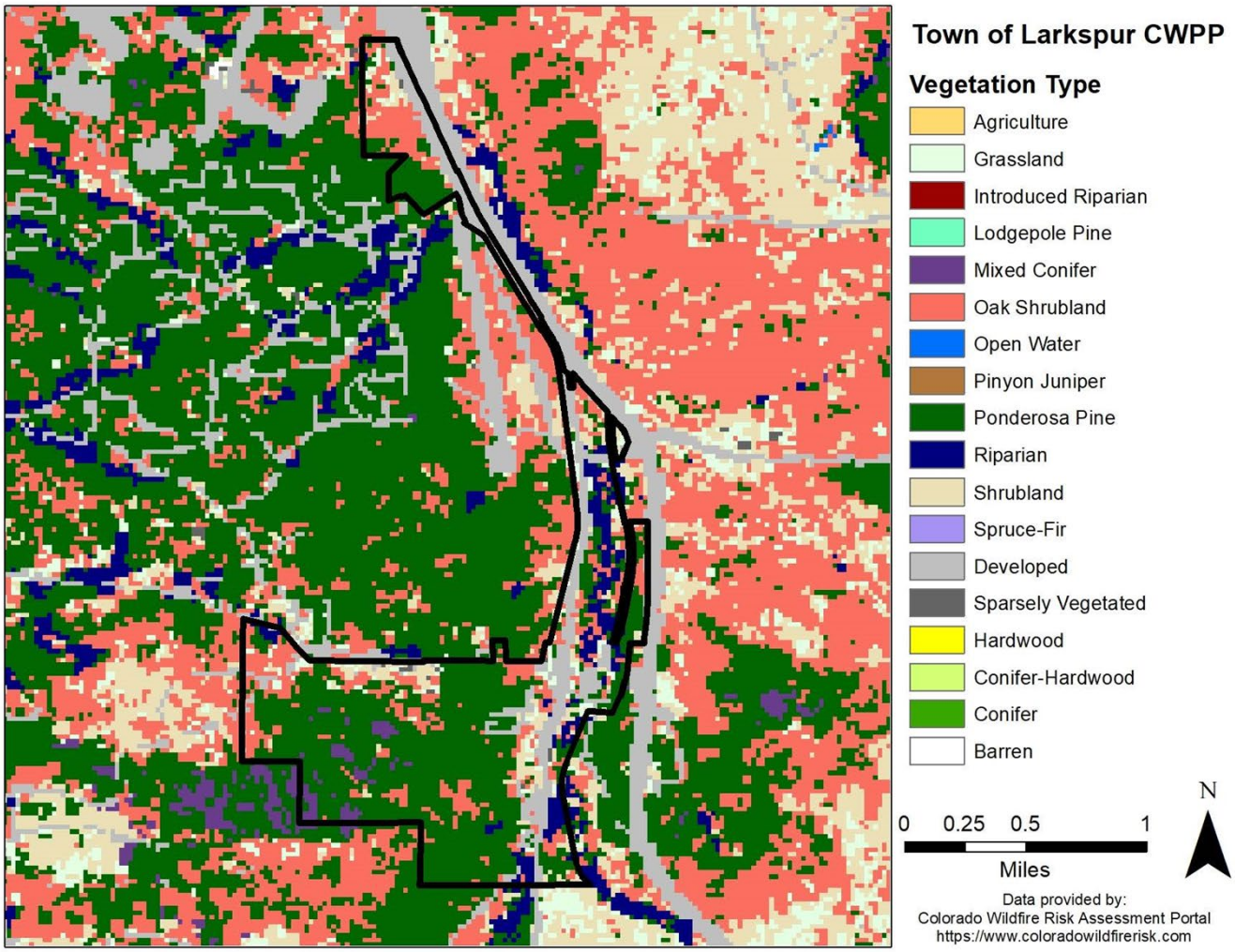
[4] *Assessing Wildfire Hazards in the Home Ignition Zone*, NFPA, 2010, Publication FWC93710PKD

[5] *Aids to Determining Fuel Models For Estimating Fire Behavior*, Hal E. Anderson, USDA Forest Service General Technical Report INT-122, April 1982.

[6] *Gaining an Understanding of the National Fire Danger Rating System (NFDRS)*, PMS 932/NFES 2665, National Wildfire Coordinating Group (NWCG), 2002.

Riparian zones along waterways and seasonal storm channels are made up of shrub species such as willows and cottonwoods, intermixed with grass fuels. These areas are of concern where they abut high density subdivisions, especially under drought conditions. Fuel models for these areas are:

- FBO Model **5**
- NFDRS Models **F** and **T**

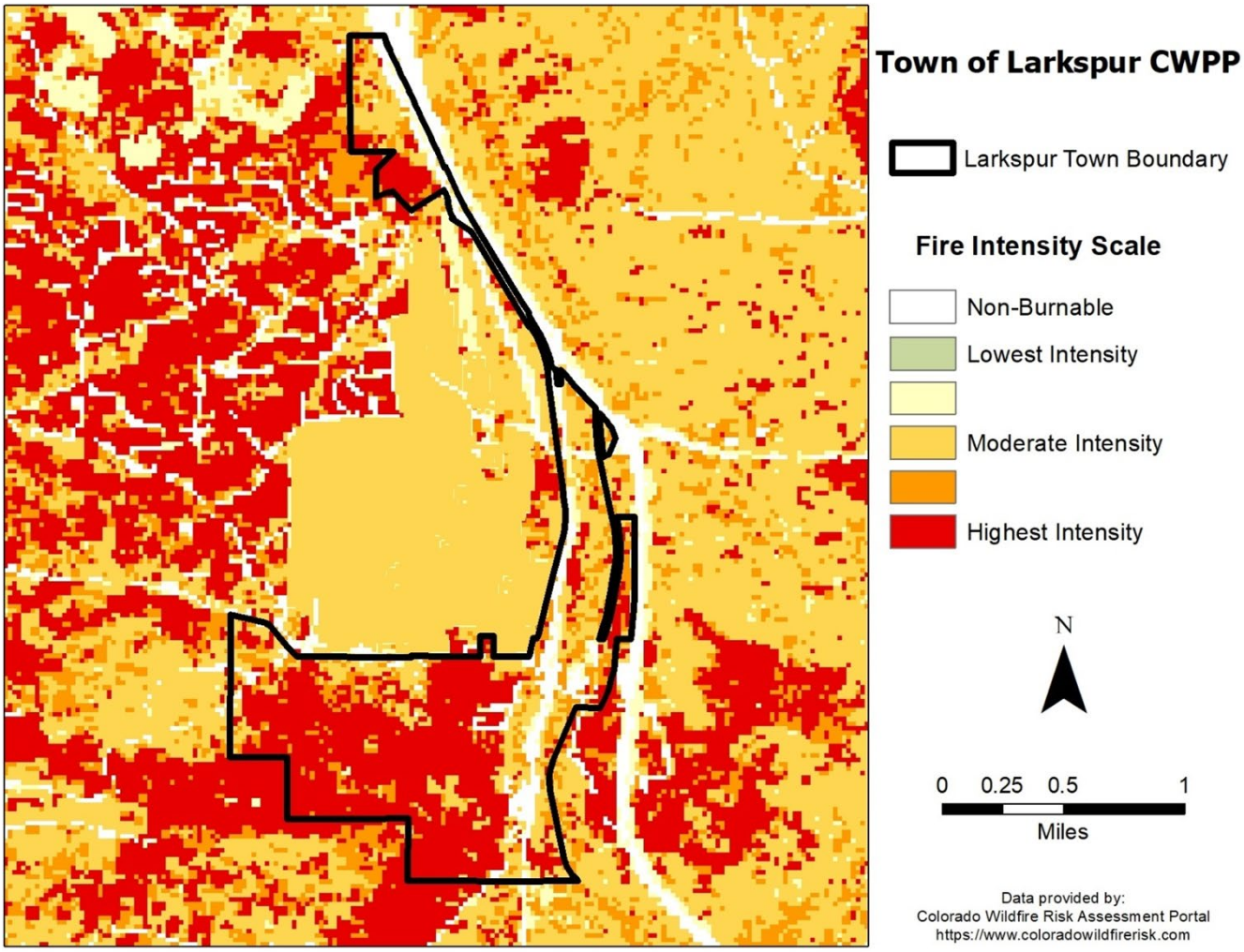


Wildland Urban Interface Fuel Types (CO-WRAP)

The wildfire intensity map represents the Colorado Wildfire Risk Assessment Portal (CO-WRAP) analysis of the potential wildfire intensity in and around the study area. Wildfire risk is the chance that a fire might start or spread into the area. Most of the community is at a “Moderate” to “High” risk for wildfire occurrence and intensity.

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

The existing fuels will have high rates of spread under relatively mild weather conditions.



Rate of Spread and Wildfire Intensity (1 Chain = 66 feet)

Local topography further aggravates fire behavior and control. Prevailing west winds are funneled through the communities involved, with eddying effects on the leeward side of the high ridge west of Town. The area is also prone to winds from the east and southeast during

upslope weather patterns. Slopes range from five to thirty percent with most forested hillsides ranging from ten to thirty percent.

Note: Rate of spread shown on these maps is under normal burning conditions. During the Black Forest Fire, burning conditions were considered extreme, with spread rates over 100 chains per hour or 1.25 miles per hour.

Preparedness to Respond

Larkspur Fire Protection District Stations and Apparatus

LFPD has at least 6 career firefighters/EMTs on duty at all times. Paid staff is augmented with around 35 trained and certified volunteer firefighters. It operates an Advanced Life Support ambulance transport service. Its fleet consists of 3 ambulances; two located at Station 161 in the Town of Larkspur and one located at Station 162 in Perry Park.

From its humble beginnings, the staffing of the Larkspur Fire Protection District has grown from just a handful of citizens to 14 full-time line staff personnel, eight part-time personnel, 32 volunteer personnel, three Command Staff/Administrative personnel, one full-time Administrative Assistant, and one part-time bookkeeper. The District's well trained staff is capable of mitigating a wide variety of emergency situation ranging from structure fires, wildland fires, and hazardous material incidents to medical emergencies requiring advanced life support and ambulance transport.

ISO (Insurance) Information

ISO stands for Insurance Services Office, and it is a division of Verisk Analytics. ISO provides information to insurance companies, including ratings of the fire protection provided in different areas of the country. This data may be used by insurance companies as one of the factors to determine rates.

Please contact ISO for its ratings on properties as it is the originating and definitive source for that information. Within the Larkspur Fire Protection District (LFPD) there are, in general, three ISO Public Protection Classification (PPC) ratings; "3", "3Y" and "10".

- In general, a property that has a water system with hydrants that meets ISO criteria for adequate fire flow and is within five road miles of an LFPD fire station is usually rated at a PPC 3.

- In general, a property that is within five road miles of an LFPD fire station or a neighboring fire department station with an automatic aid agreement with the LFPD, but is not served by a water system with hydrants that meets ISO criteria for adequate fire flow, is usually rated at PPC 3Y.

- In general, a property that is more than five road miles from an LFPD fire station or a neighboring fire department station with an automatic aid agreement with the LFPD is usually rated at PPC 10.

The Town falls within the PPC 3 rating area.

The LFPD is a combination department with career firefighters on duty at all times. The career staff of 17 firefighters is augmented with approximately 35 trained and certified volunteer firefighters and 11 part time firefighters.

- Station 161 is located at 9414 S. Spruce Mountain Rd. in the town of Larkspur and is staffed with 4 firefighters 24/7.
- Station 162 is located at 5672 Red Rock Dr. in the Perry Park Ranch subdivision is staffed with 2 firefighters 24/7.
- Station 164 is located at 15205 Furrow Rd. in the southeast section of the LFPD and is a volunteer firefighter response station.
- Castle Rock Fire Department's Station 151 is located at 300 Perry St. within the Town of Castle Rock. (Mutual Aid station location)
- Palmer Lake Fire Department is located at 12 S. Valley Rd. within the Town of Palmer Lake. (Mutual Aid station location)
- Jackson 105 Fire Protection District's Station 143 is located at 4333 W. Greenwood Rd. at the intersection with Perry Park Rd. (Mutual Aid station location)
- Franktown Fire Protection District Station 182 is located at 10650 South Highway 83. (Mutual Aid station location)

At Fire Station 161, there are two fire engines with a 1500 gallons per minute (gpm) pump each and one carries 500 gallons of water and the other 350 gallons of water and a telescoping 75 ft. ladder and aerial master stream. There is also a water tender at Station 161 with a 750 gpm pump and 3500 gallons of water. Also, at Station 161 there are two Type 6 wildland fire engines.

At Fire Station 162, there is one engine with a 1250 gpm pump and 950 gallons of water. Also, at Station 162, there is one water tender with a 250 gpm pump and 3200 gallons of water and one Type 6 wildland fire engine.

At Fire Station 164, there is one engine with a 1500 gpm pump and 500 gallons of water. Also, at Station 164 there is one tactical water tender with six wheel drive and a capacity of 2500 gallons as well as a Type 6 wildland fire engine.

Additionally, the LFPD has automatic aid agreements with the Jackson 105 Fire Protection District which responds to fire events in the northwest section of the LFPD, with the Palmer Lake Fire Department which responds to fire events in the southwest section of the LFPD, with the Franktown Fire Protection District which responds to fire events in the southeast section of the LFPD and with the Castle Rock Fire Department which responds to events in the northeast section of the LFPD. The LFPD is also on automatic aid with the North Group of fire departments within E. Paso County which respond to fire events in southern portion of the LFPD. In addition, the LFPD has mutual aid agreements in place with all Douglas County fire departments.

Staging Areas

The LFPD, in cooperation with DCSO-OEM, has identified locations where responding mutual aid fire departments may be staged for assignment in the early stages of a wildland event, or until an Incident Command Post or alternate staging area is established. These locations are dependent on fire location and behavior. These should follow NWCG guidelines for firefighter safety zones and based on all personnel in full Personal Protective Equipment (PPE). Diameters of firefighter safety zones should be adjusted based on surrounding fuel loading.

Water Supplies

Firefighting water supplies are typically available through hydrant systems in the developed portions of the Town. The Fire District has mapped these potential water supplies, and established agreements with the surrounding water districts.

Cisterns or hydrants are usually intended for use during structure fires in which, typically, only one house is on fire at any one time. Structural firefighting resources are not required to be mobile. The opposite occurs during a wildland fire in which resources must be mobile and prepared to move quickly out of harm’s way.

Water supplies are critical for maintaining lower Insurance Services Organization (ISO) ratings that affect homeowner insurance rates. In unincorporated areas of the county there are currently no requirements for providing water supplies for existing or individual residential uses. However, any new development of four or more homes must have a 30,000 gallon cistern within two miles of every driveway or be on a municipal water system.

The Town currently operates its own water system comprised of wells, tanks, pipelines, water treatment plant and hydrant system.

Evacuation Centers

Evacuation Points and Shelters will be designated at the time of the evacuation need. These will be determined in cooperation with Incident Command/Unified Command and the Emergency Operations Center. Once identified, the information will be disseminated by the Public Information Officer through media and social media channels.

Residents should have a family disaster plan in case of evacuation that includes what to take and where to meet. For more information, refer to the Douglas County Disaster Preparedness Guide at www.dcsheriff.net.

Douglas County Hazard Mitigation Plan

The Douglas County Hazard Mitigation Plan (DC-HMP) was updated in 2021 and included the Town within the plan. Douglas County also completed a county-wide CWPP that serves as an umbrella document for any localized CWPPs. The county-wide CWPP is currently being updated. The DC-HMP, prepared by Douglas County, describes the structure and guidelines for managing a major emergency or disaster affecting Douglas County and/or the Towns within the County. This plan is part of a larger system of inter-related plans at the local, state and federal levels. They are founded upon the National Response Framework (NRF) and the principles of the National Incident Management Systems (NIMS). The inter-related nature of the plans and incident management system are designed to allow maximum coordination and cooperation between responders from all levels of government. The process, as described by law and regulations, is that the incident is "owned" by the local jurisdiction having authority.

The Douglas County five-year Operating Plan, (OP) is prepared pursuant to the state OP, *Colorado Statewide Wildland Fire Operating Plan* (OP). The *Colorado Statewide Wildland Fire Operating Plan* was prepared pursuant to the *Colorado Statewide Cooperative Wildland Fire Management and Stafford Act Response Agreement*, and as amended. The Purpose of this local operating plan is applicable to all signatory parties (Douglas County, Colorado Division of Fire Prevention and Control, USDA Forest Service Rocky Mountain Region, and USDI Bureau of Land Management) within the State of Colorado. It addresses how signatories will implement cooperation, interagency working relationships and protocols, financial arrangements, and joint fire management activities within Douglas County, Colorado.

Inter-jurisdictional Cooperation

First responders and community leaders recognize that wildland fire does not respect jurisdictional boundaries, and that large fires can only be managed by pooling resources. As a result, the Town, LFPD and Douglas County cooperate with several mutual aid agencies in the state and surrounding fire districts.

Standardized Command and Control

All County fire departments use the Incident Command System (ICS) and National Incident Management System (NIMS) as a tool to manage interagency response operations. ICS/NIMS clarify roles and responsibilities in many common situations, such as when one area belongs to two overlapping jurisdictions, or when an area is not part of a fire protection jurisdiction.

Mutual Aid

The Douglas County Sheriff's Office and Board of County Commissioners (BoCC) participate in the Wildfire Operating Plan (OP) for Douglas County Colorado. The Plan, updated every five years, describes how County agencies coordinate wildfire suppression activities with those of the Colorado Department of Public Safety (DPS), DFPC, the U.S Forest Service, and the Bureau of Land Management. It outlines rules and procedures for requesting mutual aid, ordering out-of-county resources, radio communications, and air operations.

The *State of Colorado, Department of Public Safety, Intergovernmental Agreement with the Board of County Commissioners for the County of Douglas* requires Douglas County to have a signed County OP to access Emergency Fire Fund (EFF) funds.

An Expanding Hierarchy of Resources

The responsibility for wildfire suppression initially rests with the local fire jurisdiction where the wildfire starts. The Douglas County Sheriff is responsible for suppression of wildfires that occur on unincorporated, non-federal land that is outside a fire protection district. Once the Douglas County Sheriff's Office has assumed responsibility for the wildfire incident, the DCSO shall assume financial responsibility for firefighting efforts and shall assign a local incident management team to provide the command-and-control infrastructure required to manage the wildfire (C.R.S 30-10-513).

If the fire exceeds the County's capability to control, the Sheriff can request assistance from the Colorado Department of Public Safety, Division of Fire Prevention and Control (DFPC) under terms of the Emergency Fire Fund (EFF) Agreement. When EFF is implemented, DFPC assumes responsibility and authority for all suppression activity until the fire has been controlled and management of the fire has been returned to the county.

Public Notification and Warning

The Sheriff's Office has several methods to notify and warn people who are threatened by an approaching wildfire (all of which are fallible). (See Emergency Evacuation section below.):

- Automated telephone notification (Code Red).

- Local media announcements, including social media.
- **If possible and safe to do so, door-to-door warnings, as resources allow.**

Code Red

Douglas County currently utilizes the Code Red Emergency System. Notification calls, and text messages are not automatically routed to cellular phones, requiring residents with cellular phones to register their cell phones online. The same applies to residents that use Voice-over-internet-protocol (VOIP) telephone service. These phone numbers are typically not automatically included in emergency notifications unless the subscriber has registered the phone number ahead of time. Online registration instructions and links for Code Red or any future notification systems, can be located on the Douglas County website at:

http://www.douglas.co.us/codered/

Click on the "**Code Red**" tab

Automated calls may be intercepted by calling features, such as automated attendants, call waiting, busy signals and other features which may intercept or reject the call. Adding notification numbers to your telephone's phone book feature will quickly identify general and emergency notification calls, so you can readily distinguish the incoming call as an emergency alert.

The **Douglas County Access and Functional Needs Registry (AFN)** is a database containing information about individuals in Douglas County with functional needs who may require assistance in the event of a disaster. The information may also be used to assist emergency personnel and volunteers in providing assistance. Participation in the AFN Registry is voluntary, but highly encouraged.

To sign up, go to:

https://www.totalvisibilitysolution.com/DouglasCO/

DCSO's mission is to assess and plan for hazards and emergencies and work with other public safety and municipal agencies to ensure public welfare. As a pre-planning tool, the AFN Registry should be considered for all people who have special medical needs (e.g., oxygen or life support systems that are dependent upon electrical power) or have physical disabilities that would make it difficult to independently follow public safety directions, such as evacuation, if the need arose. The County will use reasonable effort to protect this information including pursuing legal action to prevent disclosure when deemed necessary by the County. However, the County does not warrant that the information provided will be held confidential under the Colorado Open Records Act. Please do not provide information that you believe would compromise your security.

The Douglas County School District, (DCSD) currently has an emergency notification system used to communicate with parents. Town residents with school age children (K-12) should contact the School District to set up an account and sign up for notifications by logging into the *Infinite Campus Parent Portal* (**campus.dcsdk12.org**) and clicking on "More" in the left-hand column. Navigate to "Family Information" and review your contact information. If you see an incorrect phone number or email, please update it in Infinite Campus, or contact the registrar at your child's school to request an update. Parents may have the following questions:

- **I received everything except a text message. How can I fix this?**
  You must select to receive text messages from our system. Confirm that you have selected to receive text messaging (SMS) for emergency and/or school notifications through Infinite Campus Parent Portal.

  What phone number will my caller ID show when I get calls?
  When you receive communication from the DCSD SchoolMessenger system, the number displayed will depend on the type of message. The two types of communication include:

  Emergency Notifications (critical communications)
  855-695-9448 (you may wish to add this number to your contacts)

  Standard Notifications (lunch balance, event reminders, general communication)
  877-279-4061 (you may wish to add this number to your contacts)

  How will you contact me?
  If there is an emergency at your child's school (Lockout, Secure, Evacuation, Shelter, Hold, etc.) we will send information to all contacts in our system via phone, text and email.

Students may be at risk if school bus routes are compromised by wildfire. The school district may be asked to keep students at school until the emergency has ended. The **DCSD School Messenger** system may be used to notify parents of the status of their children. School district and the local emergency services agencies should consider partnering, if not already doing so, to:

- Provide notification to schools with students from impacted areas.
- Train bus drivers on procedures should they encounter a wildfire situation, and awareness of alternate routes to safety, in the absence of direction from law enforcement.
- Pre-determine locations for return of students, whether to the point of origin or evacuation center.

- Utilize existing communication tools for distribution of emergency preparedness information to parents.

Evacuation and Sheltering

An Incident Commander may recommend evacuation of specific neighborhoods, or closure of certain roads; the authority and responsibility of evacuation lies with the County Sheriff, as detailed in the Douglas County Evacuation, Aler and Warning Plan.

The Douglas County Emergency Operations Center coordinates evacuation and sheltering for displaced persons, as well as their service animals, pets, and livestock.

Douglas County Animal Response Team

The Douglas County Animal Response Team (DCART) provides those in need with assistance in boarding their large, small, and domestic animals during times of evacuation caused by wildland fires and other natural and manmade disasters.

Formed in 2003, a year after the Hayman Fire affected a number of citizens and taxpayers in Douglas County, the DCART was developed to provide shelter, food, and veterinary care for non-commercial evacuated animals during emergency situations.

The DCART is comprised of volunteers from the Denver Dumb Friends League (DDFL) and the Douglas-Elbert County Horse Council.

DDFL assists DCART in the care and sheltering of small companion animals such as dogs, cats, pocket pets, chickens, etc. For more information regarding the DDFL Volunteer Program, please visit **http://ddfl.org/volunteer**. Emergency volunteering with DDFL is only available to existing DDFL volunteers.

The Douglas-Elbert County Horse Council assists DCART in the care and sheltering of large backyard livestock such as horses, llamas, alpacas, goats, and other non-commercial livestock. For more information regarding DECHC and emergency volunteer opportunities, please visit **http://www.dechc.org**.

High-use recreation centers in the Town, including religious facilities and other properties with Special Use Permits and Special Event Permits in the Town should develop and maintain comprehensive Evacuation Plans; and request a property evaluation by LFPD to identify threats and to assist with mitigation planning. Evacuation planning assistance may be requested and coordinated through the DCSO-OEM. Evacuation plans should be distributed to the emergency response organizations, through the LFPD or DCSO-OEM annually.

A key to the success of any advance planning, is training staff, exercising by performing drills and implementing corrective action(s) to the plan. The first line of defense against the effects of a disaster is personal preparedness. During an emergency, the

government and other agencies may not be able to meet your needs. **It is important for all citizens to make their own emergency plans and prepare for their own care and safety in an emergency. Registering on these websites is not a guarantee that emergency officials will be able to assist you in an emergency.**

Emergency Evacuation

NOTICE TO EVACUATE. In case of a fire or other emergency, the primary notification to evacuate will be issued by the Douglas County Sheriff by means of a reverse emergency notification system. Residents should follow the directions provided. Other notifications may come from local TV and Radio stations and social media.

It is important to note that the fatalities in both the Waldo Canyon and Black Forest Fires were residents who did not evacuate in time. Residents and visitors to the area should have pre-planned evacuation routes.

- Residents should heed evacuation instructions without delay!
- Evacuations Orders may be delayed or undeliverable due to communications failures when critical infrastructure is damaged by fire. Never rely on an automated notification to evacuate.
- If a wildfire is threatening the area, it is not necessary to wait for an evacuation order to leave.
- Facilities with large guest populations should plan on multiple means of transportation for evacuations, as DCSO, LFPD or DCSD may not have buses available at all times.

It is vitally important that residents and guest populations are prepared to evacuate long before a fire or other disaster occurs. Just as fire mitigation should be completed long before a fire threatens, a personal plan for evacuation should be prepared before it is needed. A personal evacuation plan should consist of:

- Pre-planned Evacuation Routes in the absence of direction from law enforcement.
- Papers, photos computer drives, prescriptions and other important items should be stored and ready to take a moment's notice.
- Keep a bag packed with a change of clothes and personal items packed and ready.
- Keep a complete inventory, including photos of home contents, of items in the home stored in a safe location if need to document insurance claims. Be sure that insurance coverage is adequate.
- Have a plan to shelter pets and livestock.
- Have a communication plan for all members of the family to stay in contact.
- Have an agreed upon meeting place, such as a friend's home, for family members in case family members are separated.

Additional emergency planning resources are available through the DCSO-OEM web links to the section on “Have a Plan/Build a Kit” at:

https://www.dcsheriff.net/emergency-preparedness/have-a-plan/

Risk of Ignition and Wildfire Occurrence

Causes of Wildfire Ignitions

Reconstruction of fire history and forest dynamics in the area, reveals:

1. An average fire interval of about fifty years during the period 1300-1880, but no major fires between 1880 and 2000.
2. The 2002 Hayman Fire consumed 138,000 acres. Since then, numerous larger and more destructive wildfires have occurred in the region. The 2020 fire season resulted in large fires (i.e. Cameron Peak, East Troublesome, Pine Gulch, Grizzly and Calwood fires) that exceeded the Hayman Fire in size.
3. A mix of surface fire and stand-replacing fires in the historic burns (mixed severity fire regime);
4. A striking increase in forest density from 1900-2021.
5. Extended droughts have persisted in the region.
6. Wildfire seasons may extend from March to December.

The extent of the high-severity Hayman burn in 2002 was unprecedented in the last 700 years, in part because of the dense forest conditions that had developed during the twentieth century, and in part because of the extreme drought and fire weather conditions that existed since 2000. Similar drought conditions contributed to the Waldo Canyon, Black Forest, and Lower North Fork Fires over a decade later.

The Town has multiple potential ignition sources that can contribute to wildfire starts in or abutting the Town. Some of these are:

- Railroad right-of-way through the center of Town.
- Proximity to major roadways such as Interstate 25 and Spruce Mountain Road.
- High recreation areas in and abutting the Town.
- Residential and commercial areas where sparks can be generated.
- Above ground electrical distribution systems with vegetation growth underneath. Note: Aging infrastructure and high winds caused the Cherokee Fire in 2006.

Low fuel moistures and relative humidity are common in the area, as are periods of high winds. When dry and windy conditions coincide, the stage is set for large wildfires. Human population

is also increasing in the area. All recent large fires were caused by humans. Numerous fires are ignited each year by lightning. Except for portions of Florida, Colorado has some of the highest occurrence of lightning in the continental US.

Fires originating in or near communities are the most immediate concern, but fires starting well beyond the boundaries of the planning area can have profound effects upon the communities. Rapid rates of spread and long-distance spotting are the norms for fires in the vicinity. Areas classified as high to moderate fuel loading are the at greatest risk.

Historically, wildfires were typically caused by lightning. Aboriginal use of fire in the area is unknown. Human activities, both accidental and intentional, remain as the highest risk for fire starts. The same roadways that may be critical for evacuation can also be ignition points for wildfire starts. These roadways create exposures from auto accidents, disabled vehicles, cigarettes, and right-of-way maintenance activities. Residential exposures to fire can be from maintenance equipment, barbeque grills, unsupervised youth, and burning structures. Outdoor burning, improper ash disposal, chimney fires/embers from chimneys, as well as sparks from recreational equipment and chainsaws are other common sources of wildfire starts.

Fuel Hazards

Factors Affecting Homes in the Wildland/Urban Interface

The overall risk to the community from wildland fire is moderate to high. This section will discuss the factors that led to the overall rating. All residences in the Town should be considered as being in the Wildland/Urban Interface (WUI). The homes in CWPP Study Area have various risks of being destroyed by a wildfire. The amount of risk depends on the vegetative fuels, topography, weather events, and the construction of the home itself. It is important to understand these conditions and factors to make appropriate decisions about vegetative fuels reductions.

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

Weather: Weather influences fire behavior as both a long term and transient phenomenon. Long term weather trends such as extended drought increase the possibility of ignition and increase the rate of fire spread. Strong upslope winds are an especially significant weather feature of the Douglas County area. These winds occur year-round, at 30-60 miles per hour, and caused the rapid fire-spread in the Waldo Canyon and Black Forest fires. These winds reverse the normal topographic uphill convective spread of wildfire and present the greatest threat of spreading wildfire both upslope and downslope to private lands in the Larkspur area.

Topography: Topography includes the degree of slope and the shape of the terrain. Hot gases rise in front of the fire along the slope face, pre-heating the vegetation above a fire. As

slope increases the effect of the preheating and increased spread increases, and fires may move up to four times faster with flames twice as long as a fire on level ground.

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

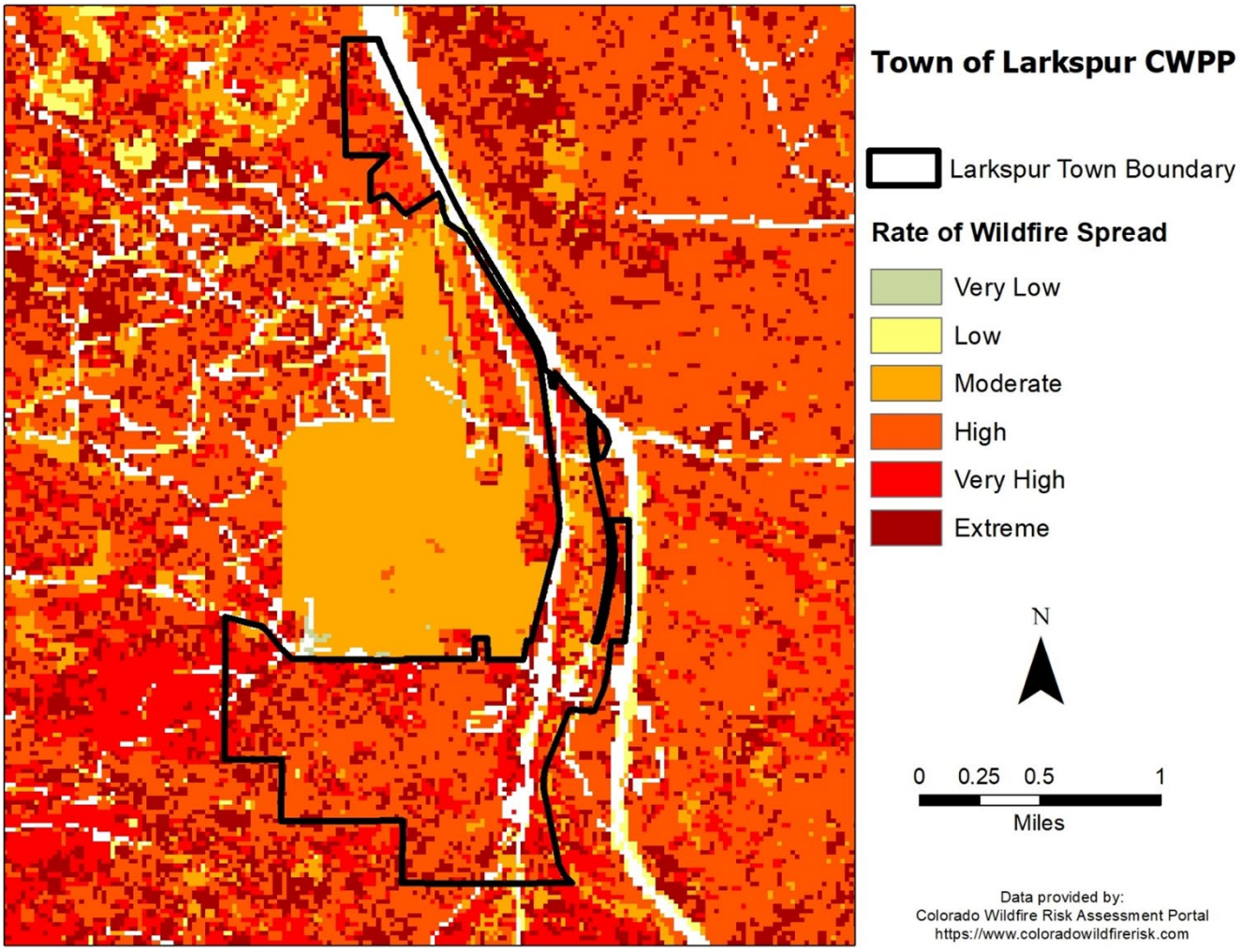
The threat of wildfire is exacerbated by deteriorating forest conditions on the Palmer Divide and along the entire western boundary of the study area. Insect outbreaks and high wind events have created heavy fuel loads of both standing dead and down heavy fuels. Concerted efforts are necessary to address this hazard by creating a wide band of fuels reduction on both public and private lands along this boundary.

Fire intensity and spread rate depend on the fuel type and condition (live/dead), the weather conditions prior and during ignition, and the topography. Generally, the following relationships hold between the fire behavior and the fuel, weather and topography.

- Fine fuels ignite more easily and spread faster with higher intensities than coarser fuels. For a given fuel, the more there is and the more continuous it is, the faster the fire spreads and the higher the intensities. Fine fuels take a shorter time to burn out than coarser fuels.
- The weather conditions affect the moisture content of the dead and live vegetative fuels. Dead fine fuel moisture content is highly dependent on the relative humidity and the degree of sun exposure. The lower the relative humidity and the greater the sun exposure, the lower will be the fuel moisture content. Lower fuel moistures produce higher spread rates and fire intensities.[7]
- Wind speed significantly influences the rate of fire spread and fire intensity. The higher the wind speed, the greater the spread rate and intensity.
- Topography influences fire behavior principally by the steepness of the slope. However, the configuration of the terrain such as narrow draws, saddles and so forth can influence fire spread and intensity. In general, the steeper the slope, the higher the uphill fire spread and intensity.

The map below shows rate of spread under normal burning conditions.

[7] Detailed weather information is available at the National Weather Service website www.weather.gov.



Rate of Wildfire Spread for the Study Area

How Structures Catch Fire

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

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

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

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

** NOTE** Over 90% of the homes lost in the Waldo Canyon Fire were from embers carried into neighborhoods by winds in excess of 60 mph. These embers were driven horizontally as a "blizzard"[8]

Home Construction and Vulnerability to Wildfire:

The communities are in a wildfire environment. Wildfires will happen—exclusion is not a choice. The variables in a fire scenario are when the fire will occur, and where. This assessment addresses the wildfire-related characteristics of the CWPP. It examines the area's exposure to wildfire as it relates to ignition potential. The assessment does not focus on specific homes but examines the community as a whole.

A house burns because of its interrelationship with everything in its surrounding home ignition zone—the house and its immediate surroundings. To avoid a home ignition, a homeowner must eliminate the wildfire's potential relationship with his/her house. This can be accomplished by interrupting the natural path a fire takes. Changing a fire's path by clearing a home ignition zone is an easy-to-accomplish task that can result in avoiding home loss. To accomplish this, combustible items such as dead vegetation and debris must be removed from the area immediately around the structure to prevent flames from contacting it. Also, reducing the volume of live vegetation will affect the intensity of the wildfire as it enters the home ignition zone.

Included in this assessment are observations made while visiting the CWPP Study Area. The assessment addresses the ease with which home ignitions can occur under severe wildfire conditions and how these ignitions might be avoided within the home ignition zones of affected residents. Residents can reduce their risk of destruction during a wildfire by taking actions within their home ignition zones. This zone principally determines the potential for home ignitions during a wildland fire; it includes a house and its immediate surroundings within 100 to 200 feet.

The result of the assessment is that wildfire behavior will be dominated by the residential characteristics of this area. The good news is that by addressing community vulnerabilities, residents will be able to substantially reduce their exposure to loss. Relatively small investments of time and effort will reap great rewards in wildfire safety.

[8] Fire Adapted Communities Assessment of the Waldo Canyon Fire, 2012, Quarles, et al.

The construction materials, location and even the shape of a structure influence its vulnerability to wildfire.[9] It is not the intent of this CWPP to suggest extensive alterations to homes that already exist in the community. Understanding how home construction affects the vulnerability of the structure to a wildfire helps residents plan defensible space projects to compensate for construction differences. When remodeling or home improvement projects are done plans can be made to reduce the ignitability of the buildings.

New home construction projects should utilize best practices for home site location and incorporate fire-resistant construction methodologies from the conceptual design phase; regardless of the nonexistence of codes or WUI ordinances requiring such actions.

To summarize, all structures in the Town of Larkspur are vulnerable to wildfire.

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

PRESCRIPTIONS FOR WILDFIRE HAZARD REDUCTION

Home Ignition Zone, Defensible Space and Fuel Breaks:

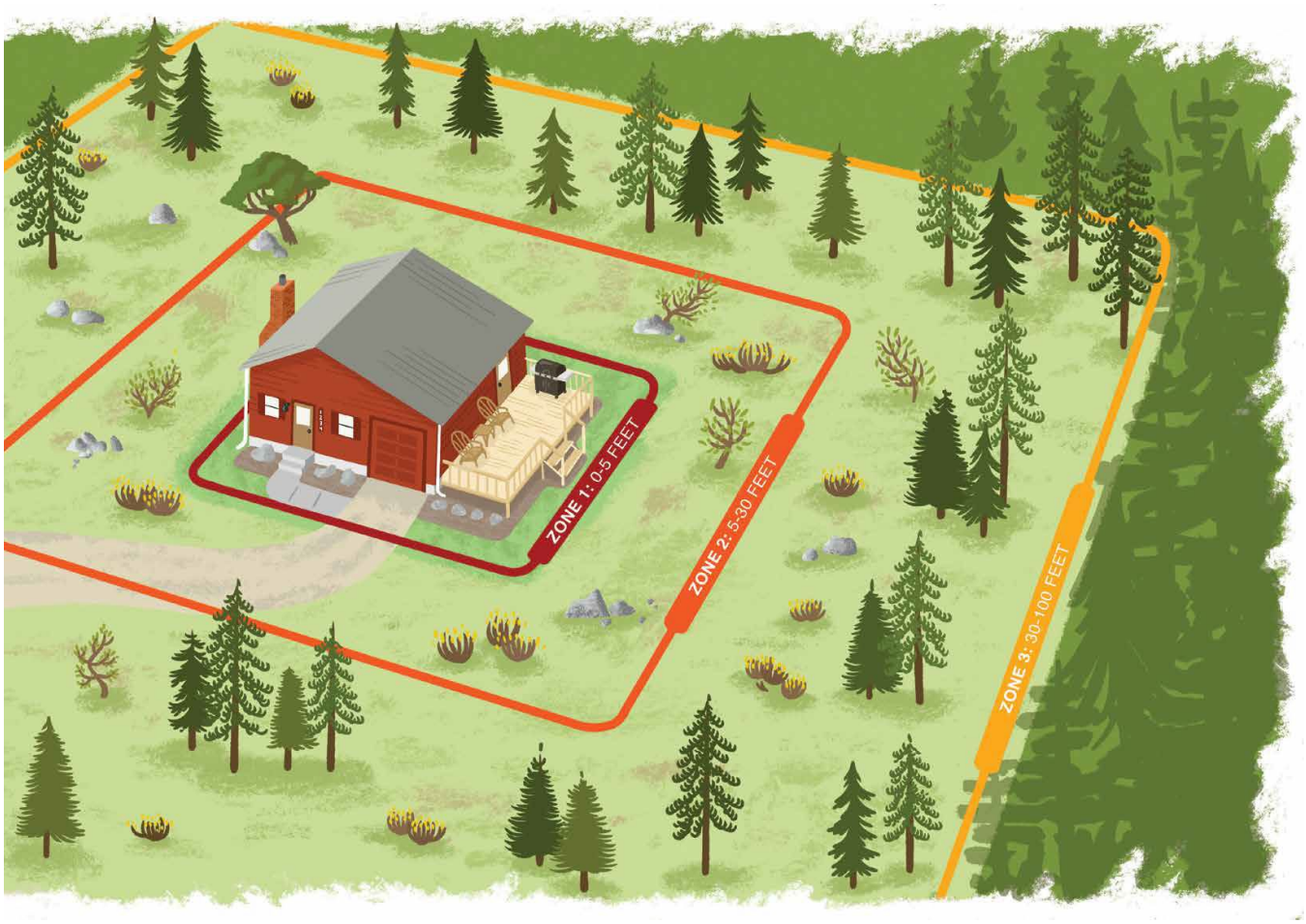


Diagram of Home Ignition Zone (Source: CSFS)

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

THE HOME IGNITION ZONE:

Modification of vegetation around a structure to reduce fire intensity is called defensible space. The term “home ignition zone” (HIZ) is defined as a structure and the surrounding vegetation.

A structure's vulnerability to wildfire depends on the surrounding vegetation, including landscaping, and the structure itself.

Protecting Homes in the HIZ: Thinning around homes is different than thinning for fuel breaks. Thinning in the HIZ is designed to protect structures from the heat of wildfires. Defensible space includes both thinning around structures to reduce the heat from burning vegetation and reducing combustibility of the structures to protect them from wind borne embers (firebrands), radiation and convective heat.

Information is available at the Colorado State Forest Service website:

www.csfs.colostate.edu

A direct link to the newest Home Ignition Zone guidelines is:

https://csfs.colostate.edu/media/sites/22/2021/04/2021_CSFS_HIZGuide_Web.pdf

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

Zone One: This is the closest zone to a structure and extends 0-5 feet from the outermost edge of a structure including any decks. The management goal is to reduce or eliminate most large trees or shrubs within this zone so that the convective heat will not ignite the structure. A few tall trees may be left in zone one if the lowest branches are pruned so that they are well above a fire-resistant roof. It is best to limit this to one or two trees near a structure. Treat such trees as part of the structure and create 30 feet of space outside the tree.

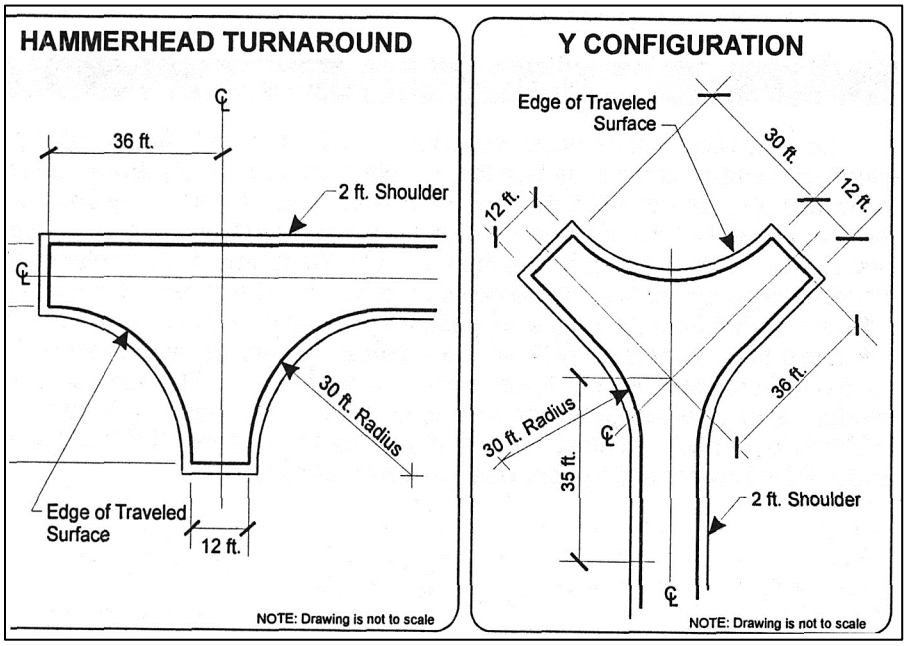
While it is necessary to remove combustible material in zone one within five feet of foundations and under decks, it is not necessary to do so elsewhere. Needles on the forest floor act as mulch retaining moisture in the soil, reduce erosion, and add organic matter to the soil as they decay. If regeneration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

Zone two: The width of zone two depends on the slope around the house. If the average slope angle is less than 5%, zone two extends out 5-30 feet from zone one. As slopes increase, increase the width of zone two on the downhill side of the house, and increase the spacing between tree crowns.

The main fuels reduction guideline for zone two is to thin the trees to an average spacing of 10-feet crown separation. Clumps of two or three trees may be retained in this zone if the

space between the clump and the adjoining trees is at least 30 feet. All ladder fuels under trees should be removed. The branches of large trees should be pruned to a height of 10 feet above ground, but small trees should have at least two-thirds of the green needles remaining.

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



Fire Engine Turn-around Requirements

Zone three: The guideline for zone three on flat ground is to thin the forest primarily to improve forest health and create at least 10 feet between tree crowns. Tree crown spacing should be increased as slopes increase. Spacing is less critical in this area but spaces should be made in the canopy. A useful rule of thumb is that, generally, a tree's branches should not touch or intermingle with branches of adjacent trees.

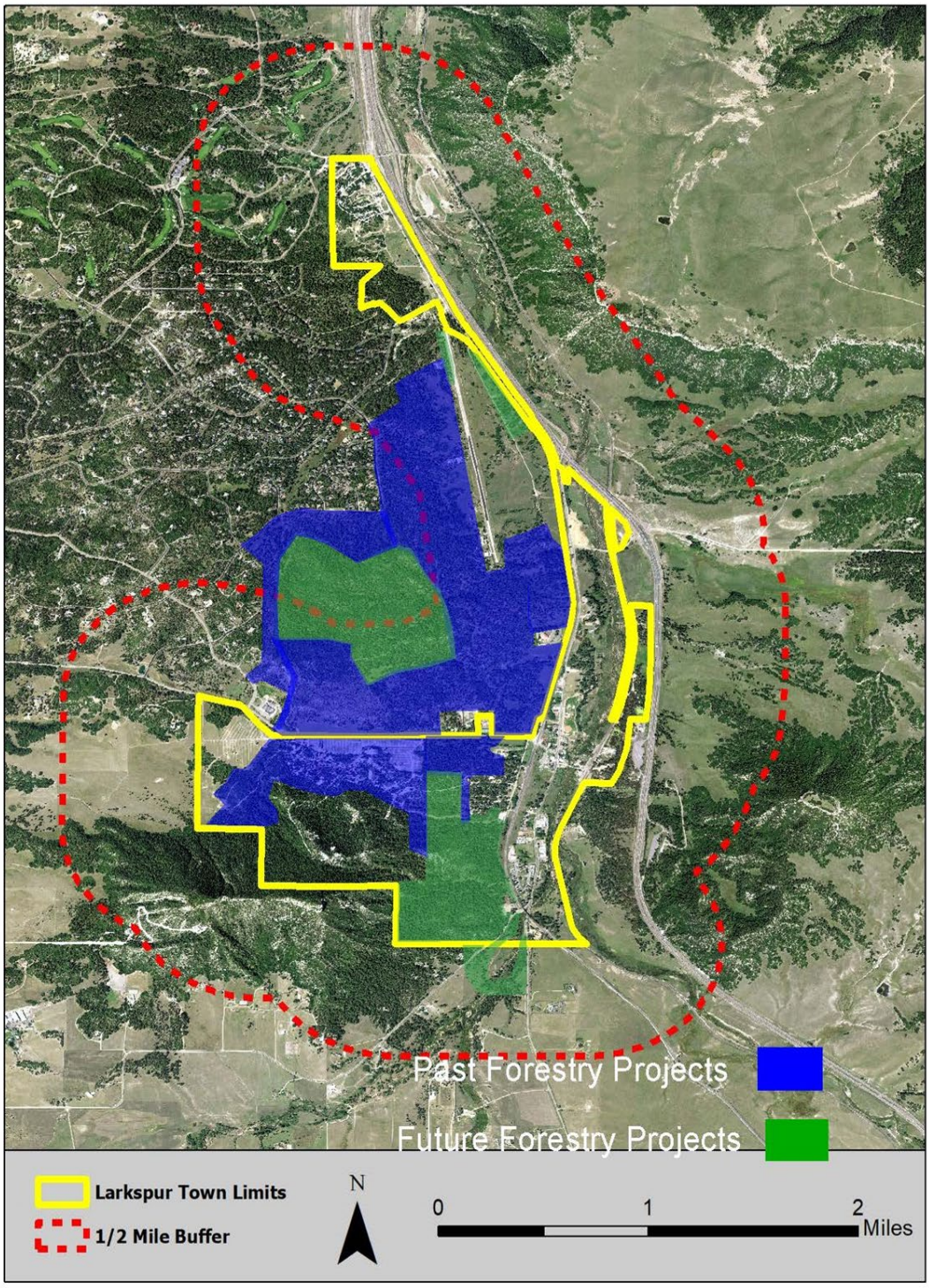
Thinning in zone three is often considered an afterthought compared to zones one and two. Thinning in zone three is usually recommended as a form of forest stewardship rather than fire mitigation. Management and thinning in this area are critical to fire mitigation on a community wide basis since it connects the defensible spaces into an integrated whole.

Thinning and Fuel Reduction

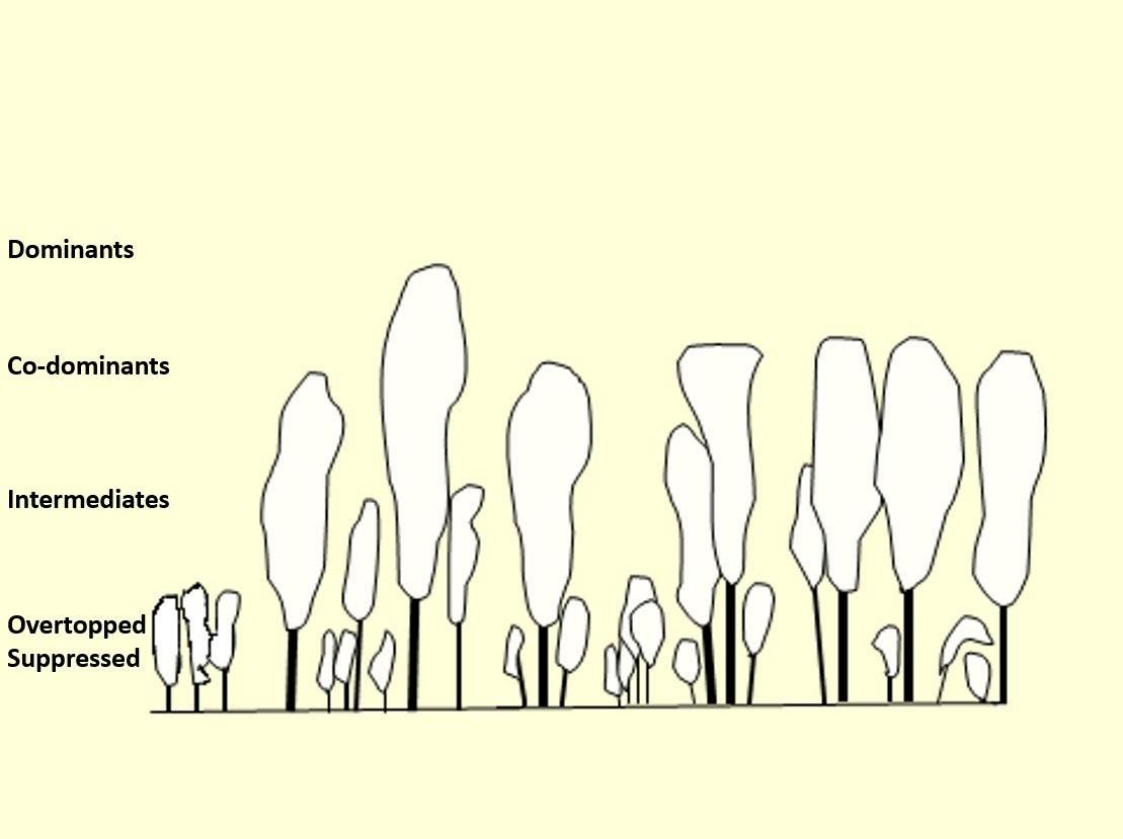
Foresters use many methods of thinning depending on the specific objectives of the landowner. Fuel break thinning is most often accomplished by a process called thinning from below. Trees are usually removed or remain based on their height in the canopy.

For simplicity, trees can be divided in four levels in the forest canopy. The largest trees at the highest level of the canopy are called dominants. These are usually the most vigorous since they have the largest root systems, most leaf area and receive the most sunlight. Next are the co-dominant trees generally the same height and diameter, but not overtopped by other trees, including dominants. Intermediate trees occupy the middle level of the canopy but tend to be crowded and of smaller diameter. They are less vigorous with smaller root systems and fewer leaves as the result of crowding by the dominant and co-dominant trees. At the lowest level of the forest canopy are the overtopped trees. These are completely shaded by the dominant and co-dominant trees. The map below shows areas in and around the Town where these practices have already been implemented.

Larkspur Aerial Map

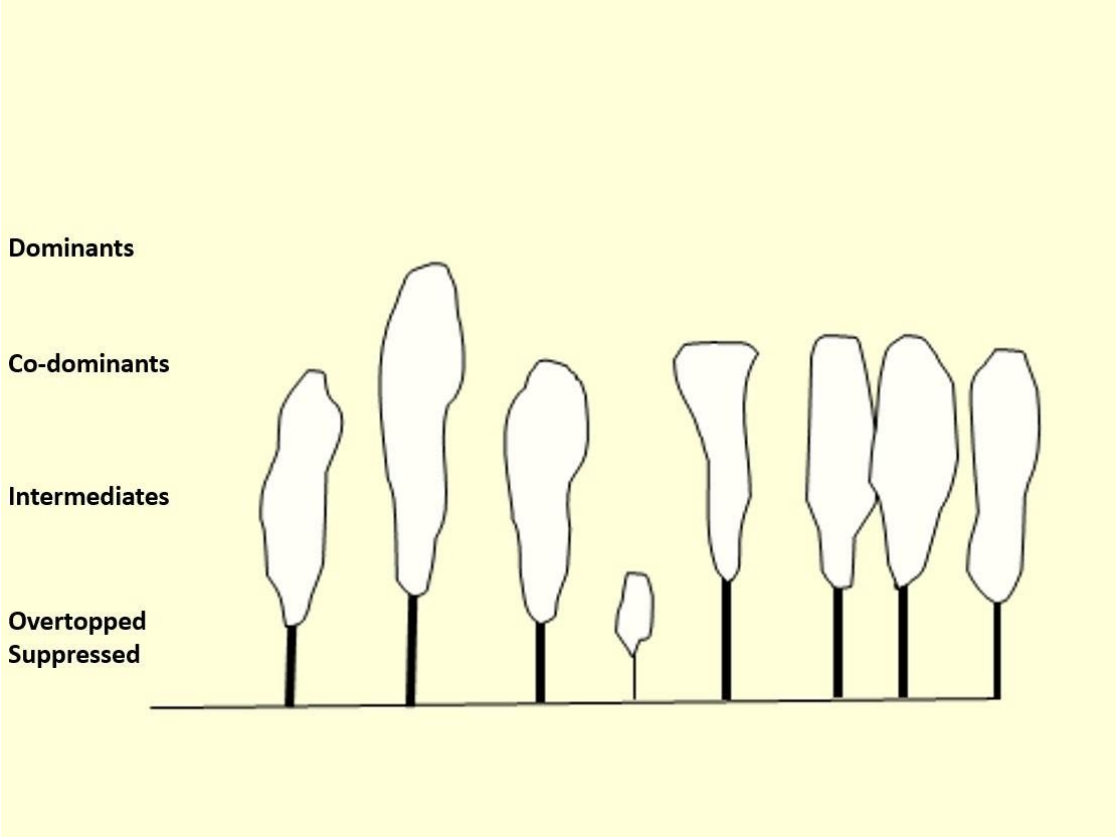


Implemented forestry project (Blue) and Planned Forestry Projects (Green)



Crown Fire Prone Stand Structure

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



Stand Structure for Reduced Crown Fire Potential

Maintenance

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

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

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

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

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

Prairie Fuels

Prairie fires have the potential to be both deadly and destructive. These fuels should be considered as moderate hazard due to their ability to spread rapidly under windy conditions. Ignition potential is high. Containment is often difficult due to spotting; especially if embers are generated by burning structures in the fire's path. Flame lengths of 9 to 15 feet can be expected. Burning yucca, native shrubs, animal dung, and noxious weeds can also contribute to spotting.

The primary technique for managing prairie fuels is by regular mowing to a maximum height of six inches. Typically, no more than two mowings per year should be necessary for lower density residential areas beyond thirty feet from structures. Areas within thirty feet of structures, including along fences, should be mowed on a more regular basis, and cut to a four-inch height. Widths of mowed buffers should be widened to allow for steep slopes, dry aspects, and prevailing winds. Grazing can also be used as a fuel management tool.

Outbuildings and vehicle storage areas should also be well maintained to prevent losses during fast moving prairie fires.

Prairie Fuels shown with high level of maintenance around structures.

Riparian Zones

Flood plain areas, riparian zones, can have high wildfire potential during the fall and winter. Extended droughts can also allow normally wet areas to burn with high intensity. Ember potential can also be high under windy conditions.

Riparian Zone with cattail fuels abutting homes.

Riparian areas should be managed carefully. Any thinning of shrubs or trees should be done by hand and use of heavy equipment should be avoided. Riparian areas may be regulated by the Army Corp of Engineers or Environmental Protection Agency under the Clean Water Act. Before any work is done in riparian areas, a site-specific consultation with a qualified professional is recommended. These areas should be monitored for wildfire risk on a regular basis. Fire starts can move quickly to fences, and then to structures.

Open Spaces

Open areas controlled by governments, homeowner associations or businesses should be mowed annually where adjacent to fences and structures. If the owner does not manage these fuels, abutting owners should ask for permission by the owner to keep it maintained. Typically, no more than two mowing's per year should be required for hazard reduction. Grasses and weeds along fence lines should not exceed six inches in height.

NOTE Wildfire mitigation publications may recommend different spacing recommendations from those listed in the previous sections. Every situation is different. You should contact LFPD to receive mitigation recommendations specific to your property.

IMPLEMENTATION AND MONITORING

Implementation

A table in Appendix A lists mitigation projects identified, their priority rankings and the lead agency for the projects. In addition to the projects in Appendix A, home sites are rated as high or extreme wildfire hazard and are in critical need of defensible space improvements.

All roads are considered as primary evacuation routes from zones of high fuel volumes (timber), and typically lead to zones of lower fuel volumes (prairies).

The following are suggested fuel treatments:

- Shaded Fuel Breaks (SFB): Major collector roads are critical for emergency evacuation. These should follow CSFS guidelines where possible.[10] Connection of homeowner HIZ's to SFB areas is recommended.
- Forest Management and HIZ overlap zones: These are on private property, typically in Defensible-space Zones 2 and 3. Ladder fuels should be reduced or removed, and forests thinned to promote forest health. Where possible, the long-range goal should be establishment of an uneven aged forest.

Key Intersections

Road intersections will be critical during a wildfire for:

- Safe egress of residents during evacuation.
- Residents may be required to wait at intersections temporarily while evacuation is staged from areas of greatest wildfire threat.
- Safe ingress of emergency services.
- Staging of fire apparatus and other equipment
- Safe staging by law enforcement personnel who may be directing traffic.

[10] Fuel Break Guidelines for Forested Subdivisions and Communities. Frank C. Dennis, Colorado State Forest Service.

Fire and smoke impinging on right-of-way during the Black Forest Fire.

Monitoring

Monitoring is an important part of follow-up to the implementation of projects. Healthy Forest Restoration Act (HFRA) instructs participants to establish, where interest is expressed by the communities, a collaborative multiparty monitoring process. This process should address reporting of accomplishments, need for maintenance of treated areas, tracking of burned areas and the positive and negative ecological and social effects of the projects. This can be incorporated into the annual reporting, and/or become a budget line item as an annual reminder to the entire community. In-kind tracking will be one way to gauge levels of participation.

Monitoring of the Larkspur Community Wildfire Protection Plan calls for an annual field review by the partners (participants) of accomplishments and need for maintenance. Based on this review, needed adjustments in the next year's plan should be made, as appropriate.

Residential Community Action Plan

During the CWPP process, the following actions were suggested:

- Provide operational authority to LFPD for use of the emergency water supplies and potential staging areas. This can be in the form of an agreement authorized by the owner or homeowner association board of directors.
- Develop a community evacuation map for distribution to all residents.
- Install evacuation route signs at critical exits from neighborhoods. (See sign example below.)

- Develop a template for installation and maintenance of community street signs, and mail kiosks to prevent damage by wildfire. All private road signage should be reflective and visible from all directions of travel.[11]
- Provide reflective address markers at entry points of shared driveways, to assist firefighters and deputies with door-to-door evacuation notifications.
- Private road and shared driveways should use metal culverts. Corrugated plastic or PVC culverts are combustible and can burn underneath an egress route. This could lead to civilian or firefighter entrapment. NOTE: An exception to this can be considered if fire rated material is used. A minimum of "B" fire rating is recommended.
- Coordinate with Douglas County and CSFS and/or adjacent landowners on identification and implementation of joint fuel treatment projects along boundaries, open spaces and roads.
- Coordinate with Douglas County Road and Bridge Department to allow for the thinning of trees and/or removal of ladder fuels within and adjacent to rights-of-way, to reduce fire starts along roads and enhance the fire containment qualities of the roadway.
- Implement at least two demonstration fuel treatments or forestry projects on private lots.
- For subdivisions with private roads, develop an overall drainage map showing locations of culverts and major drainage swales that might be impacted by post-fire sediment runoff. Erosion control contractors should be contacted to obtain pricing for post-fire mitigation.
- Implement an educational program, in cooperation with Intermountain Rural Electric Association, Black Hills Energy and Century Link for all above ground utilities. Vegetation and fencing placed around utilities should be avoided to prevent damage by wildfire. The same should apply to propane tanks.[12]
- Establish community guidelines for Firewise construction, Firewise landscaping, and forestry practices, including disposal of woody debris within the community.
- Obtain Firewise Communities/USA recognition status.
- If the Town opts not to become a Firewise Community, smaller neighborhoods within and around the Town should consider completing a community/neighborhood wildfire assessment meeting the criteria for recognition as a Firewise USA community. NOTE: Completion of the assessment will require administrative approval of LFPD and CSFS.

[11] It is recommended to follow Manual of Uniform Traffic Control Devices (MUTCD) requirements for all street signs.

[12] Propane tanks are susceptible to "boiling liquid expanding vapor explosion" (BLEVE). Older tanks may not be equipped with proper venting devices and more prone to BLEVE that may pose a risk to firefighters. Property owners should contact their propane provider to insure updated tank protections are in place.

Evacuation sign shown at locked gate. Small box above the sign is a “Knox” controlled device accessible by the fire jurisdiction. The sign is MUTCD compliant.

The following are actions the community can incorporate into its routine budget categories to manage wildfire risks. These are broken down into categories that allow for annual planning and budgeting.

Seasonal

- Mowing:
  - Roadsides and roadside ditches- Monthly or as warranted by fire danger.
  - Re-inspect all intersection sight distances for cleared sight triangles.
  - Clear all grasses and fine fuels 3-5 feet from around street signs, light poles and mailbox kiosks using weed eaters or non-selective herbicides.
  - Open Spaces – Twice per year
    - First mowing mid-summer after wildflower bloom and before grass curing (browning).
    - Second mowing in the fall after grass curing (to reduce wildfire rate of spread during fall/winter fire season, and allow new, green re-growth in the spring).
- Common Area and Entry Landscaping:
  - Landscape entrance areas with Firewise plants to illustrate Firewise landscaping principles.

    - Spring cleanup to remove all dead materials (twigs, leaves, needles, etc.).
    - Remove storm damaged trees and branches.
    - Mid-summer re-inspection to again remove fine fuels within 5-10 feet of all combustible materials.
- Education/Awareness:
    - Spring alerts/mailings for:
        - Emergency notification system signups and updates.
        - Family evacuation plans.
        - Home inventories.
        - Home assessments by local fire agencies.
    - Early to mid-Summer:
        - Firewise classes with emphasis on structural ignitability and forest health.
- Implementation
    - Annual slash disposal program.
    - Consider developing a seasonal slash disposal effort.
    - Coordinate/facilitate property-to-property (neighborhood) fuel treatment projects.
    - Each neighborhood or community should consider becoming a recognized Firewise Community.

Annual

- Renew Firewise Community status:
    - Firewise Day, meeting or special event.
- Coordinate cross-training between all committees (Forestry, Architectural Control, and Fire Mitigation, etc.)
- Update annual operating agreements with local fire agencies for emergency use of common areas and water supplies.
- Continue to encourage neighboring property owners to implement lot-to-lot mitigation projects that enhance all home ignition zones (HIZ).
- Review operating plans to determine annual project needs:
    - Apply for grant funding as available.
- Contact all partners to update any wildfire mitigation needs related to critical infrastructure.
    - IREA- Power line clearance needs along all utility easements.
    - Utility Pole Inspection and Replacement.
    - Right-of-way mowing along public roads.
- Inspect all fuel treatment areas to identify any maintenance needs, such as dead tree removal, storm damage cleanup, or insect/disease control.
- Meet with abutting ownerships to coordinate fuel treatment projects.
- Continue community wide educational programs through classes, meetings, and annual events. Topics may include:
    - Evacuation Planning.
    - **Code Red** Alert and Notification System program signup (target of 100% participation).

- Forest Health and related topics.
- Noxious Weed prevention and control.
- Wildlife habitat restoration.
- Insurance coverage for “being made whole again” in the event of home loss.
- Neighborhood Watch, and “phone trees” (cascading phone call plan to ensure all residents are notified).
- Special Needs Populations.
- Evacuation Planning for Pets and Livestock.

Every Three/Five/Ten Years

- Inspect all fuel treatments for:
  - Tree crown closure in all areas
    - Shaded Fuel Breaks and D-Space Zone 2: 10 feet between crowns (20 feet between crowns of tree clumps).
    - Forest Health Thinning D-Space Zone 3: 3-5 feet between crowns and/or to allow full sun to tree crowns for optimum tree growth/health.
  - Seedling tree invasion/encroachment
    - Mow or cut seedling and sapling size trees when located within the drip line of mature trees, or not in full sun locations.
    - Where trees establish in open areas, thin out trees to promote full crown development, and reduce crowning potential. Consider removing most encroaching trees from meadows to maintain biological diversity.
    - Prune as necessary to reduce torching potential.

Recommendations

This section provides recommendations for the many stakeholders who can have an impact on wildfire and public safety.

Town of Larkspur

The Board of Trustees has responsibility for all Town lands and infrastructure. It can also set a good example for Town residents. The following is a list of general recommendations. More specific recommendations are included in Appendix A.

- Maintain all Town parks and open spaces in a “fire adapted” condition.
- Implement defensible spaces and structural hardening on all Town owned water and sewer infrastructure. See Appendix A.
- Adopt wildfire mitigation regulations for all new construction.
- Coordinate with abutting public agencies (DC, CDOT) for implementation of joint fuel treatment projects.

- Coordinate with private landowners, both in and abutting the Town, for implementation of mutually beneficial fuel treatments and forest restoration projects. CSFS can provide assistance through its ongoing contacts with forest landowners. There are major landowners with forested properties in Zones 1-3 that can have an impact on the Town. These are:
    - American Federation of Human Rights
    - Colorado Renaissance Festival
    - Larkspur Properties
    - Mandel Family
    - Steyn Family
    - Bear Dance Homeowners Association
- Include wildfire mitigation and maintenance as an annual line item in the Town budget.
- Have an annual inspection of all Town infrastructure and facilities by LFPD to identify any mitigation needs.
- Conduct annual "Clean Up Days" to promote wildfire mitigation, noxious weed control and junk (yard art) removal.
- Continue to promote **Code Red** and **Access and Functional Needs Registry** with a goal of 100% participation by Town residents.
- Implement water system upgrades recommended in the *Water Systems Improvements 2021* report.
- Education is a powerful tool for changing behavior. The Town does not have a wildfire awareness program in place. It is imperative for the Town to reach out to existing residents and organizations as an active partner for wildfire mitigation and education.

Many of the items listed above can be incorporated into current Town operations. Some may require additional financial support. The Town should set a goal to meet all items within five years.

Douglas County

Douglas County is the governmental entity covering unincorporated areas surrounding the Town. The following are recommended:

- County Road rights–of-ways (ROW) should be cleared and kept free of invading conifer species. Conifers, ponderosa pines, contributed significantly to fire spread and heat transfer across roadways during the Black Forest and Lower North Fork Fires.

Evacuation of civilians and firefighter safety were compromised. Ditch maintenance and mowing practices are also impeded. The one exception to total tree removal is if trees are adequately spaced as part of a "shaded fuel break"[13] extending 150 feet from the ROW edge. This is a public safety issue that should be addressed as it relates to the county's charge of protection of life, safety, and welfare of its citizens.

- Plastic corrugated culverts are not currently allowed in public ROW due to their susceptibility to total consumption during wildfires. Several instances of firefighter safety being compromised during the wildfire have been reported. In one instance, a fire truck was stuck after a burnt-out culvert collapsed and nearly resulted in burn-over of the engine and crew.
- There is currently a Douglas County open space and trail head in the study area. The County should partner with the Town to mitigate these areas that abut the southeast boundary of the Town. This area, within Zone 2, should be prioritized for fuel treatments that promote fire adapted ecosystems. Fuel treatment zones should be a minimum of 300 feet wide, adjusted for slope and fuel type.
- Douglas County should not allow creation of any private open spaces or lots within any future subdivisions that abut the Town in which the ecosystem or forest has not been restored to a fire adapted condition. Refer to the *Black Forest Fire Assessment*, and its sections "Cathedral Pines Assessment" and "State School Land Section 16 Assessment"[14] as good examples to follow.
- Complete vegetation mitigation and structural hardening at the Douglas County New Covenant Radio Tower site.
- **Provide all County law enforcement and Road and Bridge personnel with Personal Protective Equipment (PPE), and entrapment avoidance training.**
- **Perform door-to-door evacuations, only if safe to do so, while maintaining life/safety of all first responders as the first priority.**
- **Consider providing NWCG wildland fire training and/or certifications for county personnel and equipment (required for use on state or federal fires).**

Fire Jurisdictions

Multiple challenges exist. Recommendations are:

[13] See document "*Fuel Break Guidelines for Forested Subdivisions and Communities*", Colorado State Forest Service, F. C. Dennis

[14] Black Forest Fire Assessment Report. Pikes Peak Wildfire Prevention Partners, 2014, www.ppwpp.org

- Continue to work toward better communication coordination. The Firefighter Survey[15] noted poor radio communications during the Black Forest Fire that placed firefighters at risk. Communications were hampered by irregular terrain that creates "shadowed" areas with little or no coverage.

- Educate elected officials and the public on the continued need for improved water supplies. At the same time, it is critical to stress that cistern water supplies are for structure protection when one structure is on fire at one time, or for containment of smaller wildfires with normal weather conditions. Extreme wildfire behavior threatens hundreds of structures at one time.

- Educate elected officials and the public on the use and limitations of aerial firefighting resources as an effective tool **if** property owners have managed their fuels. The public must understand that aerial resources are a valuable tool, but are not a substitute for inaction by property owners.

- Continue efforts to educate WUI residents on their responsibility to manage their fuels so firefighters can work safely and effectively to protect their lives, properties, and forests.

- Continue and expand the number of home and community assessments.

Resident Responsibilities

Multiple large fires have occurred in this area, resulting in the loss of homes. Additional fires are certain to occur in the future. Residents and property owners should be put on notice that:

- Wildfire mitigation is the responsibility of the property owner who is the sole owner of his/her fuels. An Australian saying bluntly states, "You own the fuel, you own the fire." A model for homeowner responsibility is shown below.

- Secondary responsibility falls on neighbors who must work together to manage their collective wildfire risks. Property owners who do not mitigate their fuels place their neighbor's lives, homes and forests at risk.

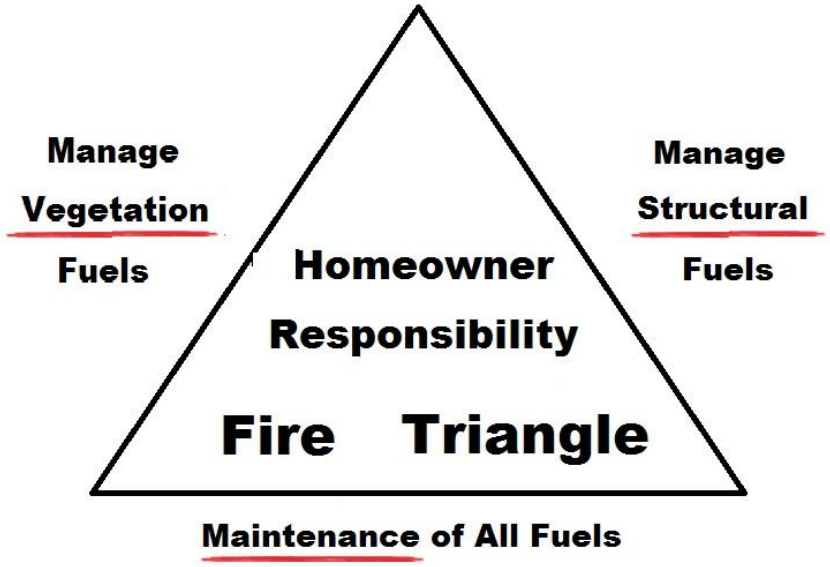
- Thinning trees to provide good spacing between individual or groups of trees, and pruning dead and lower branches, reduces wildfire risk as well as improve forest health, vigor, growth and aesthetic value.

- Structural hardening against ember ignitions and flames must be done on all structures constructed in wildfire prone environments. This will be critical to maintain access to affordable homeowner insurance.

[15] Black Forest Fire Assessment Report. Pikes Peak Wildfire Prevention Partners, 2014, www.ppwpp.org

- Property owners must recognize their responsibility to firefighters by providing a safe working space. Firefighters will attempt to protect all homes, if given a chance. Owners should also be aware that failure to mitigate their structures and native fuels may negate the time and expense invested by those who mitigated their fuels.
- Structure protection by firefighters during an incident is not guaranteed.
- Property owners must learn that traditional firefighting resources are based on one house on fire at one time. Wildfires, especially with extreme burning conditions, place hundreds of homes at risk at one time. Property tax assessments are predicated on the traditional model- not the wildfire model.

Firefighters are trained to understand two important "triangles". The first is the Fire Triangle representing Fuel, Heat and Oxygen. The second is the Fire Behavior Triangle representing Fuel, Weather and Topography. Homeowners should adopt the triangle shown below since they are responsible for their vegetative fuels, structural fuels, and maintenance of both.



A proposed new Homeowner Fire Triangle[16] in which property owners take personal responsibility for their private property

[16] Based on wildland firefighter "Fire Triangles". Fire Triangle is fuel, heat and oxygen. Fire Behavior Triangle is fuel, weather and topography. The common element is fuel- the only shared and controllable element.

Critical Lessons Learned

No amount of fire engines, firefighters, bulldozers, slurry bombers or helicopters could have stopped the Waldo Canyon or Black Forest Fires. Unmitigated forest fuels combined with up sloping terrain and high winds immediately overwhelmed any attempts at containment. Unfortunately, four residents lost their lives in the ensuing firestorms.

Critical lessons learned were:

- Defensible spaces are critical for insuring firefighter safety and effectiveness.
- Defensible spaces and Home Ignition Zones can be overwhelmed by wildfire from adjoining properties.
- Where forest fuels have been treated, tree losses and resource damage are significantly reduced.
- Fire is an ecological process. Fire adapted communities are more resilient and result in reduced risks.
- Structural hardening to prevent ember ignitions is just as important (if not more important) as treatment of surrounding native fuels.
- Unregulated construction in areas prone to extreme wildfire behavior will continue to result in similar disasters.

Summary

This plan is intended as a guide to help reduce losses from catastrophic wildfire. The CWPP is a living document that allows for flexibility and adaptive management. Adjustments, based on new science and technologies, can be adopted without need for plan modification, so long as the intent of the CWPP is met.

The Town of Larkspur is a special area and provides a unique living environment with its mix of forests and prairies. Wildfires are inevitable and a part of the Ponderosa Pine, mixed-conifer and prairie ecosystems. It is not a matter of “if”, but “when” wildfires will occur. It takes a community that is resolved to work together to manage this risk. Responsibility begins with every property owner, supported by community wide mitigation efforts.

Appendix A

Town of Larkspur
Fuel Treatment Projects and Priorities

Appendix A

The following pages contain projects the Town and its partners can undertake to manage wildfire risks to the Town. These should all be considered high priority projects to complete within the next five years. Any fuels mitigation on ownerships within the ½ mile wide Zone 2 should be included as a priority. Partners may include:

American Federation for Human Right- AFHR
Colorado Renaissance Festival- CRF
Larkspur Properties- LP
Douglas County- DC
Douglas County Sheriff's Office- DCSO (includes Office of Emergency Mgmt.)
Colorado Dept. of Transportation- CDOT
Larkspur Fire Protection District- LFPD
Colorado State Forest Service- CSFS
Perry Park Water and Sanitation District- PPWSD
Bear Dance HOA or Golf Course- BD

Town of Larkspur

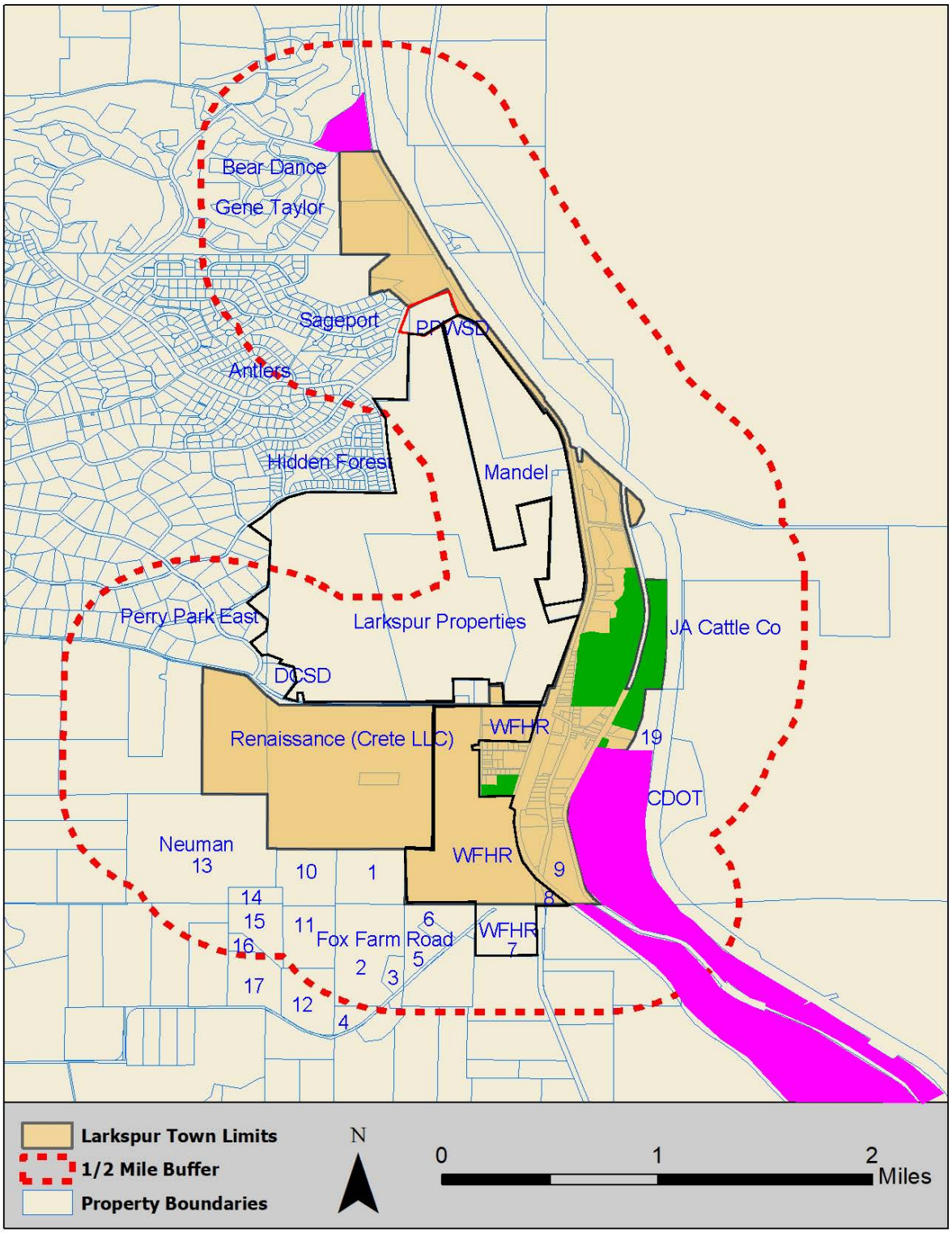
Critical Infrastructure	**Action**	**Partnerships**
Water System	Implement water system upgrades recommended in the *Water System Improvements 2021 Report*	
	Provide backup power supplies to all wells, pump houses and water treatment plants.	
	Install five feet wide noncombustible border around all buildings and structures.	
	Implement defensible space and HIZ fuel treatments around all structures.	AFHR, CRF
	Implement forest fuel treatments around all water tank sites, minimum 300 feet wide.	CRF
Sewer System	Install five feet wide noncombustible border around all buildings and structures.	
	Mitigate all fuels within 200 feet of all buildings and structures.	CDOT
	Install backup power supply necessary to continue sewage treatment in case of outages.	
Ingress/Egress Routes		
	Install secondary access to Larkspur Station	DC

	Investigate potential for secondary emergency egress to Douglas Blvd., Columbine St., Curtis Rd. and Colorado Ave. neighborhood and install.	AFHR
	Treat all native vegetation to shaded fuel break specifications along all Town streets to minimum width of 150 feet, each side.	
	Investigate potential for secondary emergency egress to Frink/Frank Rd. neighborhood. Implement if possible.	DC, CDOT
	Provide additional access control, adequate turning area and signage at access to sewage facilities.	
	Establish formal emergency egress for Jellystone with connections to Tenderfoot, Skyview Lane or I-25 ROW.	BD, DC, CDOT
	Upgrade bridge over East Plum Creek to handle any size fire apparatus.	
Forest Fuel Treatments	All Town properties treated to mitigate ladder fuels and implement forest restoration and/or fire adaption.	
	All forest lands and shrublands within ½ mile wide Zone 2 abutting the Town	DC, AFHR, CRF, LP, CDOT, Mandel, Steyn, PPWSD
Annual and ongoing events	Educational programs	LFPD, DCSO, CSFS
	Maintenance of prairie fuels	
	Maintenance of fuel treatments	
	Annual cleanup projects around businesses and residences.	

The following page is a map showing Zones 1 and 2 and covers the project areas described above. Appendix B includes maps of Compartments 1-3.

- Major Landowners within half mile wide buffer zone around the Town
- Compartment 1-A
- Compartment 1-B
- Compartment 2
-Compartment 3
- Past and future forest project areas administered by CSFS

Larkspur Ownership Map



Appendix B

Town of Larkspur
Compartment Maps

Compartment Maps

Showing

Critical Infrastructure and High Priority Mitigation Areas

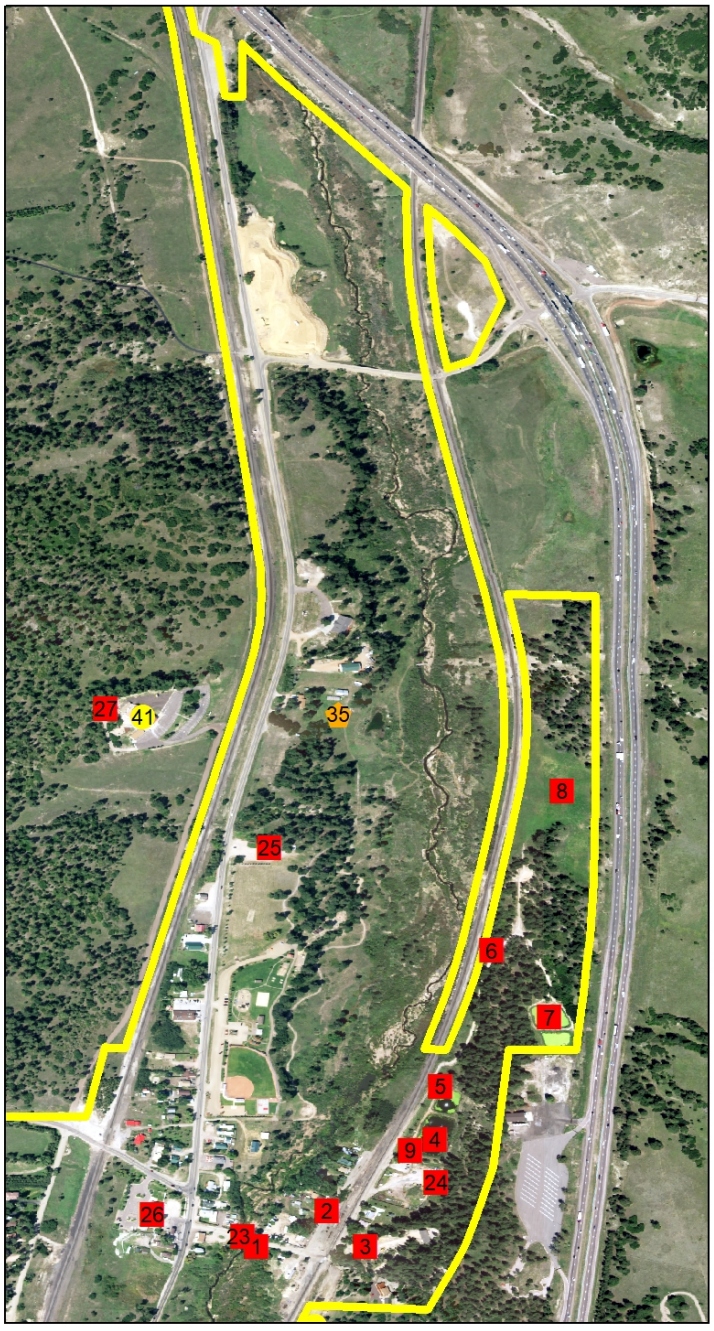
(See corresponding numbers on attached maps)

#	Description	Compart-ment	Comment
1	Water Main crossing Plum Creek	1-A	
2	Frink and Frank Street Water Mains	1-A	
3	Sewer “Influent” Station at Town Yard	1-A	
4	Sewage Lagoons	1-A	
5	Sewer Effluent Station	1-A	
6	Sewer Effluent pump and irrigation shed	1-A	
7	Sewer Rapid Infiltration Ponds	1-A	
8	Sewer Effluent Irrigation Pastures	1-A	
9	Sewer Facilities Access Road	1-A	
10	Hydrants at Larkspur Station (mobile home community)	1-B	
11	Perry Park Ave. Water Main	2	
12	Douglas Lane Water Treatment Plant	1-B 2	
13	Hydrants at Heights Neighborhood	1-B 2	
14	“Lower Pump House”	2	
15	Private Hydrant System (CRF)	2	
16	Water Tank #3	2	
17	Well AR-1	2	
18	Well D-1	2	
19	Pump house for Wells A-3 and D-1	2	
20	Upper Water Tank	2	
21	Outfall Water Line to Water Treatment Plant	2	
22	LFPD Station 161	1-B	
23	One-lane Bridge Access to Sewer and Town Facilities	1-A	
24	Town Maintenance Facility	1-A	
25	Town Hall	1-A	
26	US Post Office	1-A	
27	Cell Tower	1-A	

28	Perry Park Water and San. Treatment Plant	3	
29	Cell Tower and Antennae Site	2	
30	Larkspur Elementary School	2	
31	Water Tank (PPWSD)	2	
32	Interstate 25 Interchange	3	
33	Larkspur Station Community	1-B	
34	South Commercial Zone	1-B	
35	North Commercial Zone	1-A	
36	Douglas County Trail Head	1-B	
37	Federation H.Q. (WFHR)	2	
38	Colorado Renaissance Festival (CRF)	2	
39	Heights Residential Neighborhood	1-B 2	
40	Fischer Enterprises	2	
41	New Covenant Church	1-A	
42	Jellystone Campground	3	
43	250K Water Tank	3	
44	Potential Emergency Egress from Jellystone to Bear Dance Rd.	3	
45	Emergency Egress to Tenderfoot Drive, Sageport	3	
46	Potential Egress to Territorial Road	3	
47	Tenderfoot Drive	3	
48	Railroad Right-of-way	3	
49	Egress to Jellystone Utility complex	3	
50	Bear Dance Road	3	
	Water Storage and Distribution System Upgrades to Enhance Firefighting Capabilities		Items per *Preliminary Engineering Report for Water System Improvements- 2021*
	Up-size 1270’ of water main in Spruce Mtn. Rd.	B-1	Table 17, Pg. 70
	Repairs to Upper Tank #2	B-3	Table 17, Pg. 71
	Restoration/Repairs to Standby Tank #1 (as needed)	Comp. 2	Pg. 35
	Replace Well AR-1 with new Denver Formation Well	A	Table 18, Pg. 71
	Upgrade water valves	B-2	Table 17, Pg. 70
	High Pressure Zone Booster Pump Station- Install automatic switching capability	Comp. 2	Currently, must be done manually.

	Install backup power supplies to Water Treatment Plant, and Well AR-3	Comp. 2	Overhead power supply at risk.
	Install backup power supplies to critical booster pump, chlorination, and metering facilities.	Comp. 2	Ensure ability to refill all tanks during wildland fire.

Note: Current water system meets requirements structural protection when one structure is on fire. During wildland fires, multiple structures are threatened, and water supplies are used to protect unburned structures. Due to limited resources (man-power, engines and water), burning structures may be written off as total losses with all resources used to protect unburned structures.



Compartment 1-A

Infrastructure

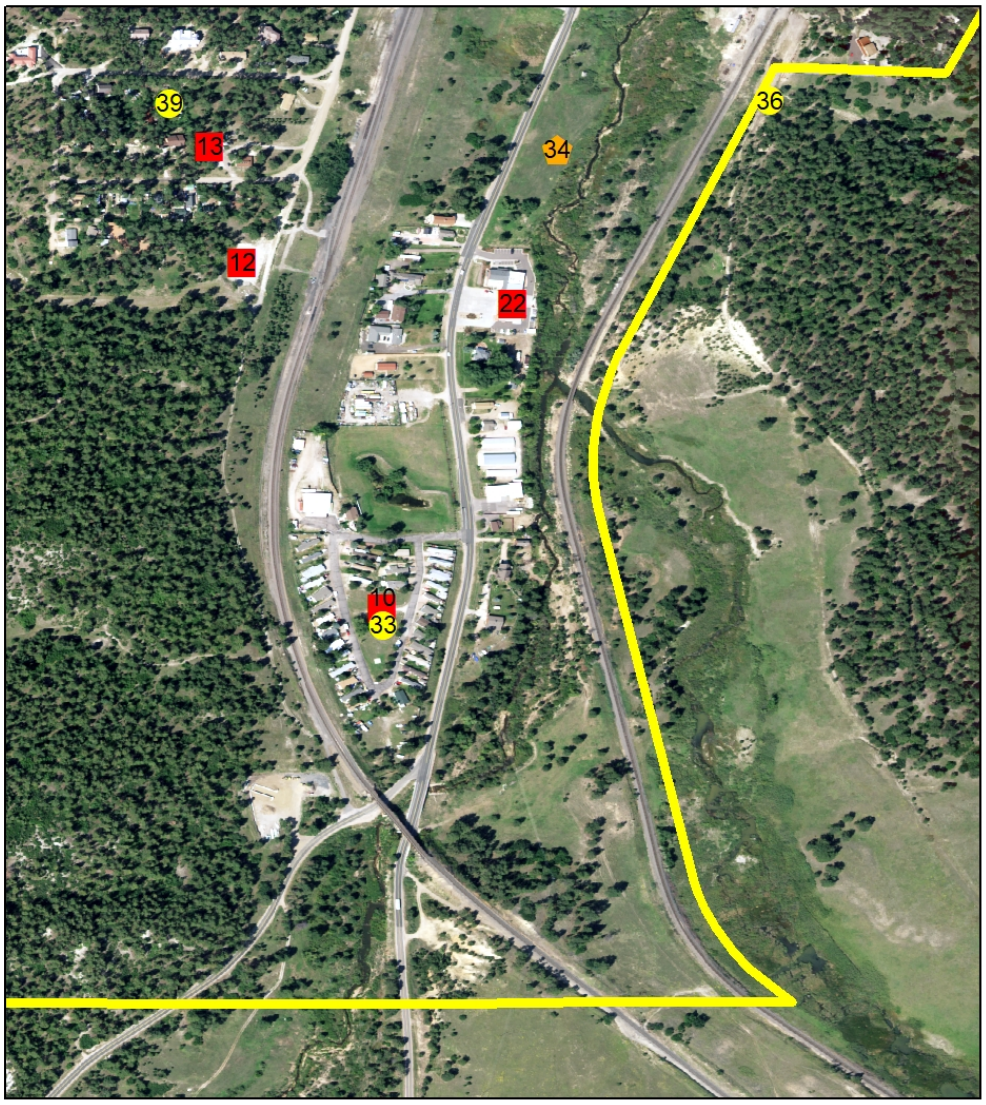
- Critical
- Commercial Zone
- Non-critical
- Larkspur Town Limits

1. Water main crossing Plum Creek
2. Frink and Fran Street water mains
3. Sewer "influent" station at Town Yard
4. Sewage Lagoons
5. Sewer "effluent" station
6. Sewer "effluent" pump and irrigation shed
7. Sewer "rapid infiltration ponds"
8. Sewer effluent "irrigation pastors"
9. Sewer facilities access
23. One lane bridge access to sewer facilities
24. Maintenance facility
25. Town Hall
26. Post Office
27. Cell Tower
35. North commercial zone
41. New Covenant Church

N

0 0.25 0.5 Miles

Compartment 1-B



0 0.2 0.4 Miles

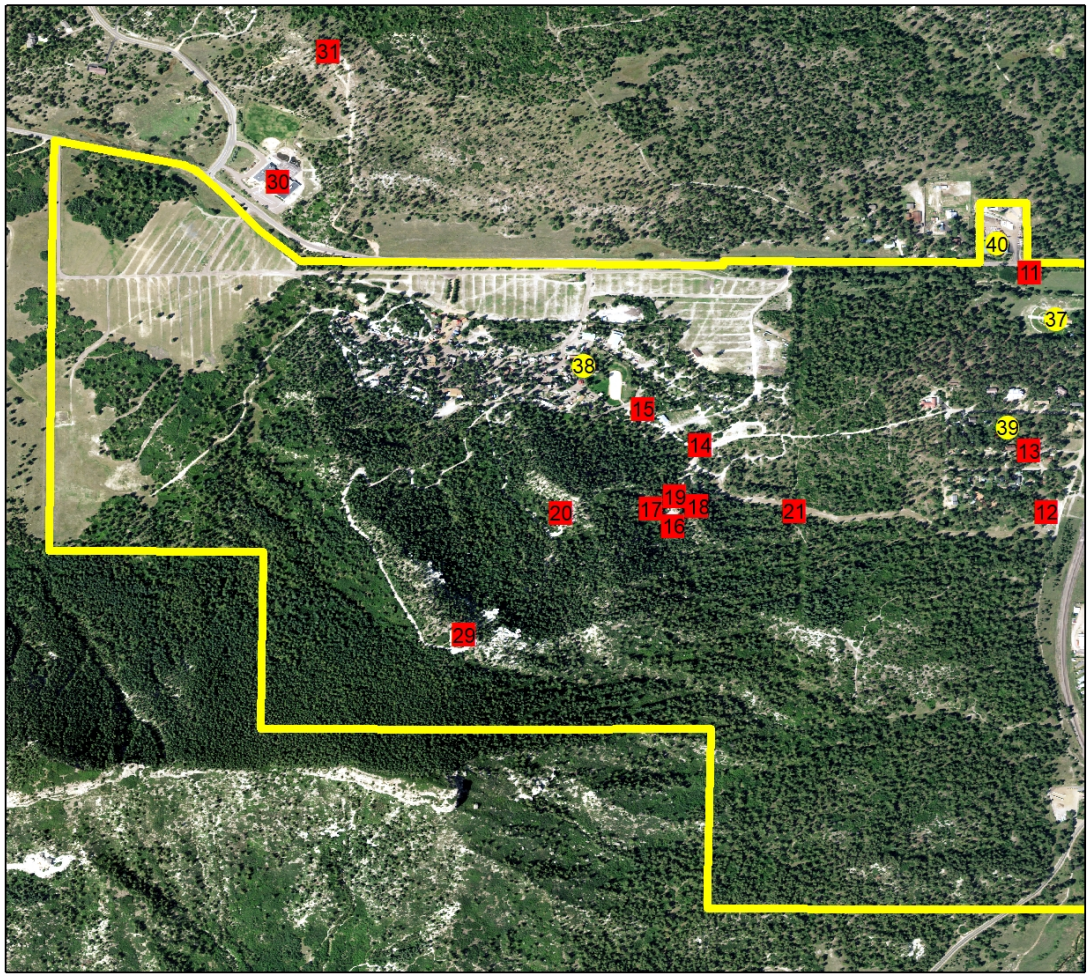
N

Infrastructure

- Critical
- Commercial Zone
- Non-critical
- Larkspur Town Limits

10. Hydrants at mobile home park
12. Douglas Lane water treatment plant
13. Hydrants at Heights neighborhood
22. LFPD station 161
33. Larkspur Station mobile home park
34. South commercial zone
36. Douglas County trail head
39. The Heights residential neighborhood

Compartment 2



Infrastructure

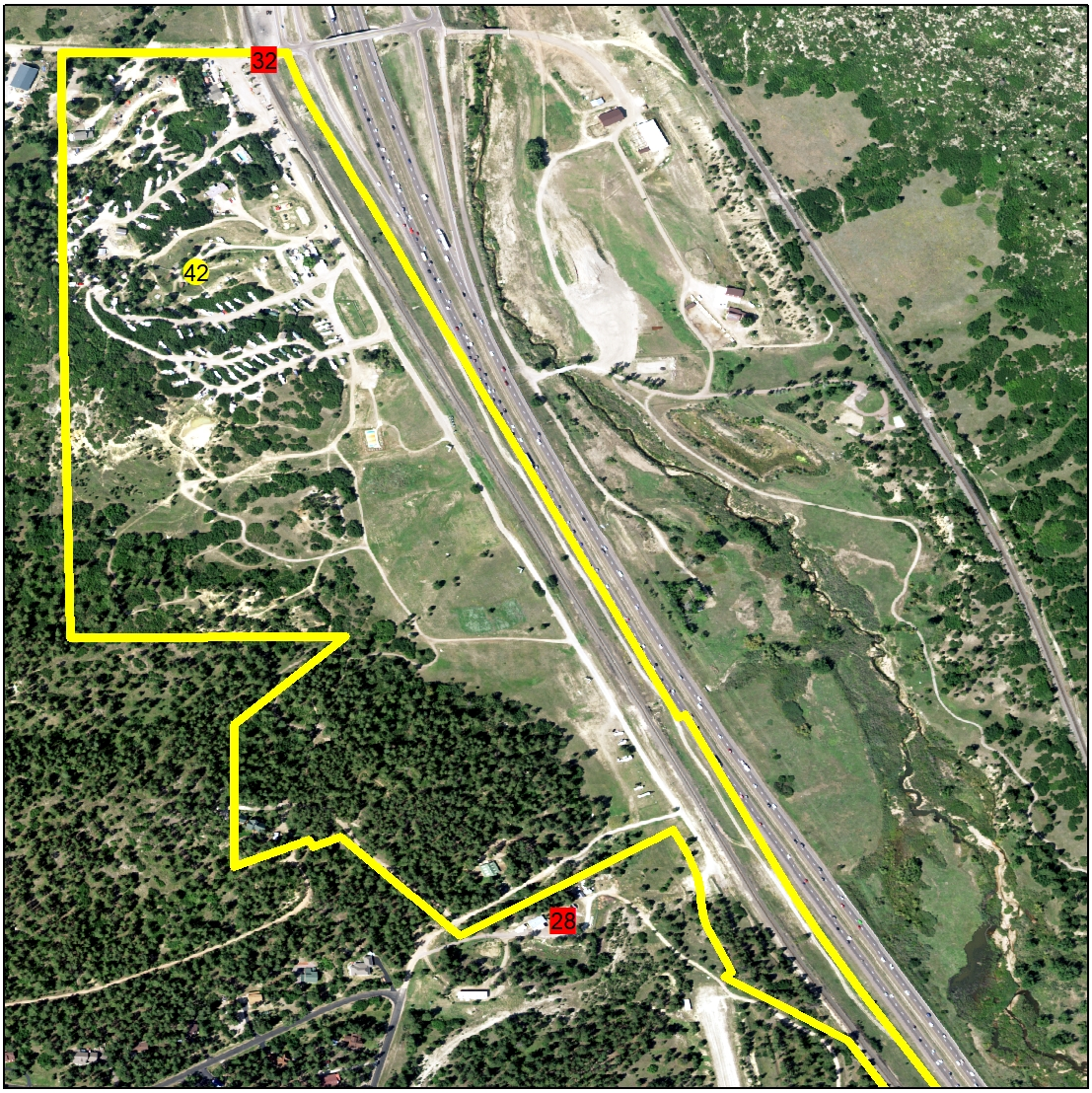
- Critical
- Commercial Zone
- Non-critical
- Larkspur Town Limits

11. Perry Park Ave. water main
12. Douglas Lane water treatment plant
13. Hydrants at Heights neighborhood
14. "Lower Pump House"
15. Private hydrant system
16. Water tank #3
17. Well A-3
18. Well D-1
19. Pump house for wells A-3 and D-1
20. Upper water tank
21. Outfall line to town
29. Cell tower
30. Elementary School
31. Water storage tank
37. Federation H.Q.
38. Renaissance Festival
39. The Heights residential neighborhood
40. Fischer Enterprises

0 0.25 0.5 Miles

N

Compartment 3



0 0.25 0.5 Miles

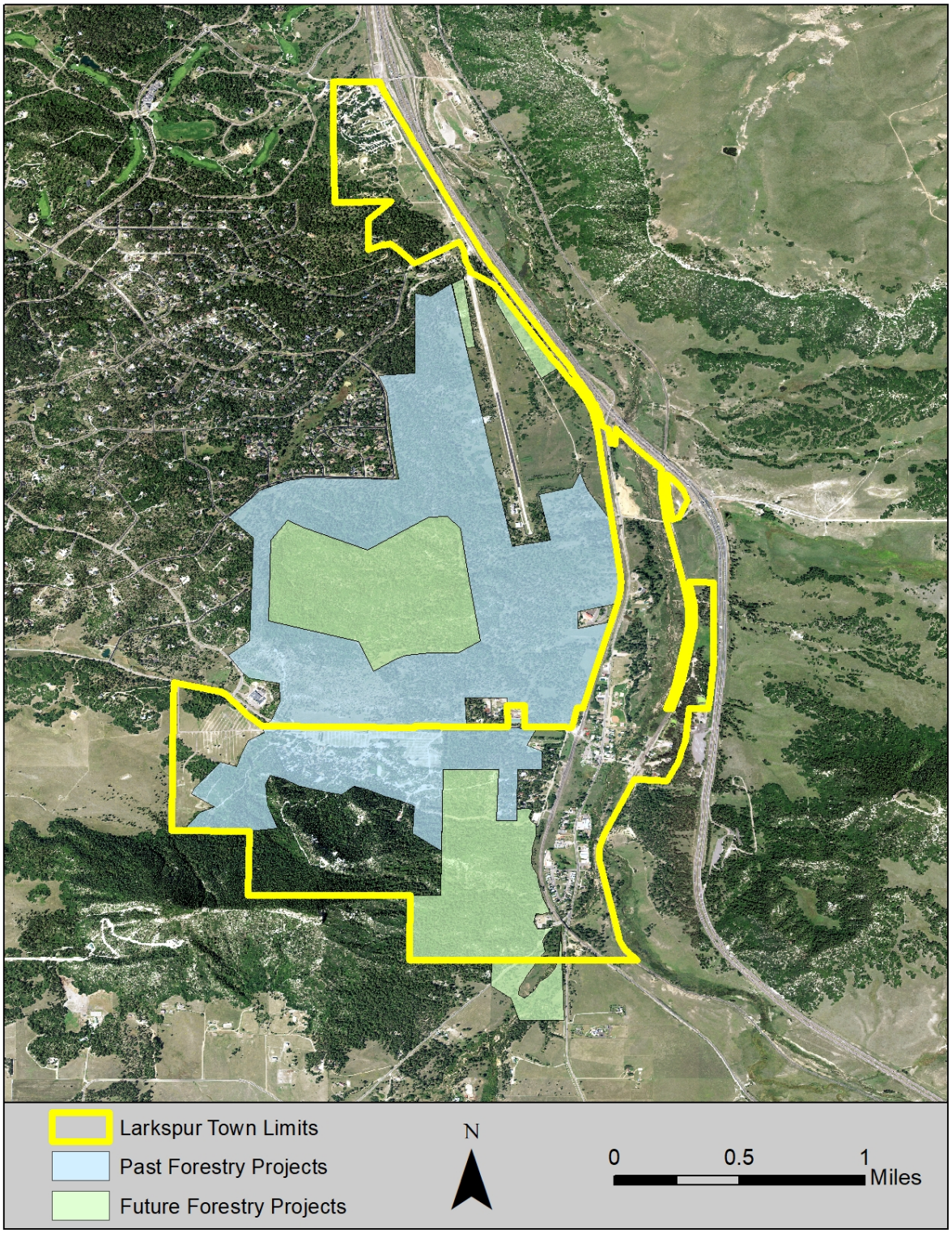
N

Infrastructure

- Critical
- Commercial Zone
- Non-critical
- Larkspur Town Limits

28. PPWSD facility
32. I-25 interchange
42. Jellystone campground

Past and Future Forestry Projects



Appendix C

Wildfire Preparedness and Mitigation Resources

Wildfire Information Sources

Colorado State Forest Service- www.csfs.colostate.edu

Pikes Peak Wildfire Prevention Partners- www.ppwpp.org

1. Black Forest Fire Assessment Report
2. Black Forest Fire Video

Emergency Notification

Code Red- http://www.douglas.co.us/codered/

Douglas County homeowners who do not have Century Link land lines are not in the emergency notification system. Voice-Over-Internet-Phones (VIOP), such as Comcast, and mobile lines are not in the system. These must be registered at the sheriff's office web site listed above.

Douglas County Access and Functional Needs Registry (AFN) for residents with special needs during an emergency:

https://www.totalvisibilitysolution.com/DouglasCO/

Firewise Communities- www.firewise.org

Ready! Set! Go! (RSG)- www.wildlandfirersg.org

Insurance Institute for Business and Home Safety (IBHS)
Web site: www.disastersafety.org

1. Site has regional guides for retro-fitting homes for wildfire.
2. Wildfire Home Assessment & Checklist
3. View videos of ember ignition lab tests.

Fire Adapted Communities (FAC)- www.fireadapted.org

MUST SEE VIDEOS:

- ***Wildfire! Preventing Home Ignitions*** View at www.firewise.org
- YouTube videos: View at www.youtube.com
    - Type "Melody Lane Fire" in the browser (see a wildfire in real time destroy 5 homes)
    - Type "IBHS, Ember" in the browser (see a home ignited by embers in a laboratory setting)

Appendix D

Acronyms
And
Glossary of Terms

Acronyms Used:

AFHR- American Federation of Human Rights
AFN- Douglas County Access and Functional Needs Registry
BHE- Black Hills Energy
BOCC- DC Board of County Commissioners
CDOT- Colo. Dept. of Transportation
CL- Century Link
CO-WRAP- Colo. Wildfire Risk Assessment Portal
CRF- Colorado Renaissance Festival
CSFS- Colorado State Forest Service
CWPP- Community Wildfire Protection Plan
DC- Douglas County Government
DCART- Douglas County Animal Rescue Team
DC-HMP- DC Hazard Mitigation Plan
DCSD- Douglas County School District
DCSO- Douglas County Sheriff's Office
DCSO-OEM- Office of Emergency Management, DCSO
DDFL- Denver Dumb Friends League
DECHC- Douglas-Elbert County Horse Council
DFPC- Colo. Div. of Fire Prevention and Control
DPS- Colo. Department of Public Safety
D-Space- Defensible Space
EFF- Emergency Fire Fund
EMT- Emergency Medical Technician
EOC- Emergency Operations Center, DCSO
EOP- Emergency Operating Plan
FBO- Aid to Determining Fuel Models for Estimating Fire Behavior (aka "Anderson")
GPM- Gallons per minute
HFRA- Healthy Forest Restoration Act of 2003
HIZ- Home Ignition Zone
ICS- Incident Command System
IREA- Intermountain Rural Electric Association
ISO- Insurance Services Office
LFPD- Larkspur Fire Protection District, also referred to as the "District"
LP- Larkspur Properties, private landowner
MUTCD- Manual of Uniform Traffic Control Devices
NFDRS- National Fire Danger Rating System
NIMS- National Incident Management System
NRF- National Response Framework
NWCG- National Wildfire Coordinating Group
PPC- Public Protection Classification
PPE- Personal Protective Equipment
PPWSD- Perry Park Water and Sanitation District
ROW- Right-of-way
SFB- Shaded Fuel Break
TOL- Town of Larkspur
USDA- United States Department of Agriculture
USDI- United States Department of Interior
USFS- USDA Forest Service
VIOP- Voice over internet protocol
WUI- Wildland Urban Interface

Appendix D
Glossary

Abiotic Factors: The non-living components of the environment, such as air, rocks, soil, water, peat, and plant litter.

Aerial fuels: Standing and supported live and dead combustibles not in direct contact with the ground and consisting mainly of foliage, twigs, branches, stems, cones, bark, and vines: typically used in reference to the crowns of trees.

Canopy: The forest cover of branches and foliage formed by tree crowns.

Chain: A measuring tape, often nylon, 50 meters or 75 meters in length, used to measure distances. This term is derived from an old unit of measurement (1 Chain = 66 feet, 80 Chains = 1 mile).

Chimney: A topographical feature such as a narrow drainage on a hillside or the upper end of a box canyon that could channel wind, smoke or flames up the slope; acting as a fireplace chimney would to draw smoke and heat upward.

Class A Roof: Effective against severe fire test exposures, as classified by the Universal Building Code (UBC). Under such exposures, roof coverings of this class are not readily flammable, afford a fairly high degree of fire protection to the roof deck, do not slip from position, and are not expected to produce flying brands.

Class B Roof: Effective against moderate fire test exposures, as classified by the Universal Building Code (UBC). Under such exposures, roof coverings of this class are not readily flammable, afford a moderate degree of fire protection to the roof deck, do not slip from position, and are not expected to produce flying brands.

Class C Roof: Effective against light fire test exposure, as classified by the Universal Building Code (UBC). Under such exposures, roof coverings of this class are not readily flammable, afford a measurable degree of fire protection to the roof deck, do not slip from position, and are not expected to produce flying brands.

Clearcut: An area of forest land from which all merchantable trees have recently been harvested.

Climax Forest: A forest community that represents the final stage of natural forest succession for its locality, i.e. for its environment.

Coarse Woody Debris (CWD): Sound and rotting logs and stumps that provide habitat for plants, animals, and insects, and a source of nutrients for soil development.

Commercial Thinning: A silviculture treatment that "thins" out an overstocked stand by removing trees that are large enough to be sold as poles or fence posts. It is carried out to improve the health and growth rate of the remaining crop trees.

Competing Vegetation: Vegetation that seeks and uses the limited common resources (space, light, water, and nutrients) of a forest site needed by preferred trees for survival and growth.

Conifer: Cone-bearing trees having needles or scale-like leaves, usually evergreen, and producing wood known commercially as "softwoods."

Conservation: Management of the human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations. It includes the preservation, maintenance, sustainable utilization, restoration, and enhancement of the environment.

Crown fire / Crowning: A form of extreme wildland fire behavior consisting of fire that advances from top to top of trees or shrubs more or less independent of a surface fire. Crown fires are sometimes classed as running or dependent to distinguish the degree of independence from the surface fire.

Deciduous: Perennial plants that are normally leafless for some time during the year.

Defensible Space: An area within the perimeter of a parcel, development, neighborhood, or community where basic wildland fire protection practices and measures are implemented, providing the key point of defense from an approaching wildfire or defense against encroaching wildfires or escaping structure fires. The perimeter as used herein is the area encompassing the parcel or parcels proposed for construction and/or development, excluding the physical structure itself. The area is characterized by the establishment and maintenance of emergency vehicle access, emergency water reserves, street names and building identification, and fuel modification measures. In simplest terms, it is adequate space between structures and flammable vegetation which allows firefighters a safe working area from which they can attack an oncoming wildfire. Defensible Space is the best element of fire protection for individual property owners.

Dripline: The outer most leaves on a tree defines its dripline and the ground within the dripline is known as the drip zone; also defined as the area defined by the outermost circumference of a tree canopy.

Deforestation: The removal of a forest stand where the land is put to a non-forest use.

Eave Opening: A vent located in an eve or soffit which allows airflow into the attic and/or walls of a structure.

Ecosystem: A functional unit consisting of all the living organisms (plants, animals, microbes) in a given area, and all the non-living physical and chemical factors of their environment, linked together through nutrient cycling and energy flow. An ecosystem can be of any size a log, pond, field, forest, or the earth's biosphere but it always functions as a whole unit. Ecosystems are commonly described according to the major type of vegetation; for example, forest ecosystem, old-growth ecosystem, or range ecosystem.

Ember: See Firebrands

Ember Outwash: Firebrands carried by high winds typical of extreme wildfire behavior. Also called ember blizzards. Firebrands behave like wind driven snow and move in a horizontal direction, like snow during a blizzard.

Escape route: A preplanned and understood route firefighters take to retreat from an unsafe or fire-threatened area and move to a safety zone or other low-risk area**.**

Extreme fire behavior: A level of fire behavior that ordinarily precludes firefighting methods involving direct attack on the fire. One or more of the following is usually involved: high rate of spread, prolific crowning and/or spotting, presence of fire whirls, strong convection column. Predictability is difficult because such fires often exercise some degree of influence on their environment and behave erratically, sometimes dangerously.

Felling: The cutting down of trees.

Firebrands: Flaming or glowing fuels lofted into the air during intense burning by strong upward convection currents. Also referred to as airborne embers. Firebrand movement may be horizontal during wind-driven wildfires.

Fire break: A natural or constructed fuel-free barrier used to stop or check fires that may occur, or to provide a control line from which to work.

Fire front / Flame front: The part of a fire within which continuous flaming combustion is taking place. Unless otherwise specified, the fire front is assumed to be the leading edge of the fire perimeter.

Fire Dependent: Requiring one or more fires of varying frequency, timing, severity, and size in order to achieve optimal conditions for population survival or growth.

Fire Hazard Mitigation: Various methods by which existing fire hazards can be reduced in a certain area, such as fuel breaks, non-combustible roofing, spark arresters, etc.

Fire Management: The activities concerned with the protection of people, property, and forest areas from wildfire and the use of prescribed burning for the attainment of forest management and other land use objectives, all conducted in a manner that considers environmental, social, and economic criteria.

Fire Suppression: All activities concerned with controlling and extinguishing a fire following its detection.

Firewise: A National Fire Protection Association's (NFPA) program encouraging local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in the effort to protect people and property from wildfire risks.

Forest Fire: Any wildfire or prescribed burn that is burning in forest, grass, alpine, or tundra vegetation types.

Forest Type: A group of forested areas or stands of similar composition (species, age, height, and stocking) which differentiates it from other such groups.

Fuel: Any living or dead material that will burn.

Fuel break: An existing barrier or change in fuel type (to one that is less flammable than that surrounding it) or a wide strip of land on which the native vegetation has been modified or cleared, that acts as a buffer to fire spread so that fires burning into them can be more readily controlled. Often selected or constructed to protect a high value area from fire.

Fuel Management: The act or practice of controlling flammability and reducing resistance to control of wildland fuels through mechanical, chemical, biological, or manual means, or by fire in support of land management objectives.

Fuel reduction zone: An area similar to a fuel break but not necessarily linear, in which fuels have been reduced or modified to reduce the likelihood of ignition and/or to reduce fire intensity thereby lessening potential damage and resistance to control.

Home Ignition Zone (HIZ): An area including the home and its immediate surroundings within which burning fuels could potentially ignite the structure; usually considered to be an area extending out roughly 100 feet from the home. The HIZ is often used to describe the area in which fuel modification measures should be taken to protect the home.

Ladder Fuels: Fuels that provide vertical continuity between the surface fuels and crown fuels in a forest stand, thus contributing to crown fires.

Lines of Effort: Tasks sets or sets of actions that are linked or coordinated with other task sets to accomplish a larger mission or reach a desired end state. Lines of effort allow leaders and decision makers to direct a variety of separate actions toward a unified result.

Maximum Density: The maximum allowable stand density above which stands must be spaced to a target density of well-spaced, acceptable stems to achieve free-growing status.

National Fire Protection Association (NFPA): A private, non-profit organization dedicated to reducing fire hazards and improving fire service.

Pitch Tubes: A tubular mass of resin that forms on bark surface at bark-beetle entrance holes.

Prescribed Burning: Controlled application of fire to wildland fuels, in either their natural or modified state, under certain conditions of weather, fuel moisture, soil moisture, etc. as to allow the fire to be confined to a predetermined area and at the same time to produce results to meet planned land management objective.

Ready, Set, Go (RSG): A program, managed by the International Association of Fire Chiefs (IAFC), seeking to develop and improve the dialogue between fire departments and residents. The program helps fire departments teach individuals who live in high-risk wildfire areas how to best prepare themselves and their properties against fire threats.

Regeneration: The act of renewing tree cover by establishing young trees, naturally or artificially note regeneration usually maintains the same forest type and is done promptly after the previous stand or forest was removed.

Saddle: A depression, dip or pass in a ridgeline; significant in wildland firefighting because winds may be funneled through a saddle, causing an increase in wind speed.

Safety zone: An area essentially cleared of flammable materials, used by firefighters to escape unsafe or threatening fire conditions. Safety zones are greatly enlarged areas in which firefighters can distance themselves from threatening fire behavior without having to take extraordinary measure to shield themselves from fire/heat.

Shaded fuel break: A fuel break built in a timbered area where the trees within the break are thinned and limbed up to reduce crown fire potential, yet retain enough crown canopy to provide shade, thereby making a less favorable microclimate for surface fires.

Silviculture: The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands. Silviculture entails the manipulation of forest and woodland vegetation in stands and on landscapes to meet the diverse needs and values of landowners and society on a sustainable basis.

Snag: A standing dead tree or part of a dead tree from which at least the smaller branches have fallen.

Stand: A continuous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit.

Spot Fire / Spotting: Fires ignited beyond control lines or outside the perimeter of a fire by firebrands landing on/among flammable material. Spot fires/spotting are a form of extreme fire behavior typically resulting from high wind conditions.

Structure protection: A defensive strategy in wildland firefighting in which firefighters are assigned to evaluate, prepare and, when possible, defend structures/homes that may be threatened by a wildfire.

Structure triage: Evaluating and sorting structures/homes into categories based on their relative likelihood of surviving a wildland fire threat (*defensibility*). Triage decisions are based multiple factors and conditions occurring during an actual fire - weather, fire behavior, home ignition potential, defensible space, presence of escape routes, and availability of firefighting resources, among others - with the goal of doing the most good with the resources available.

Succession (or Ecological Succession): The replacement of one plant and/or animal species over time by another in progressive development toward climax vegetation.

Surface fuels: Fuels lying on or near the surface of the ground, consisting of leaf and needle litter, dead branch material, downed logs, bark, tree cones, and low-lying live vegetation.

Survivable space: A term typically used to describe the area around a structure/home indicating that fuels in the area have been reduced to the point that there is little or no serious fire threat to the structure; the structure has a high probability of surviving a wildland fire without anyone on scene providing active protection.

Thinning: A cutting made in an immature crop or stand primarily to accelerate diameter increment, but also, by suitable selection, to improve the average form of the tree that remain.

Torching: The burning of the foliage of a single tree or a small group of trees, from the bottom up. Sometimes, also called candling. Torching is an extreme form of fire behavior, similar to but less extreme than crowning in that crowning affects larger numbers, even entire stands of trees.

USDAFS: United States Department of Agriculture - Forest Service, what is commonly known as just "The Forest Service"

Wildland-Urban Interface or Wildland-Urban Intermix (WUI): The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Although ***Interface*** is the more general, more commonly used term; it technically refers specifically to the area where development and wildlands meet. ***Intermix*** indicates the presence of wildland vegetation/fuels intermingled throughout the developed area.