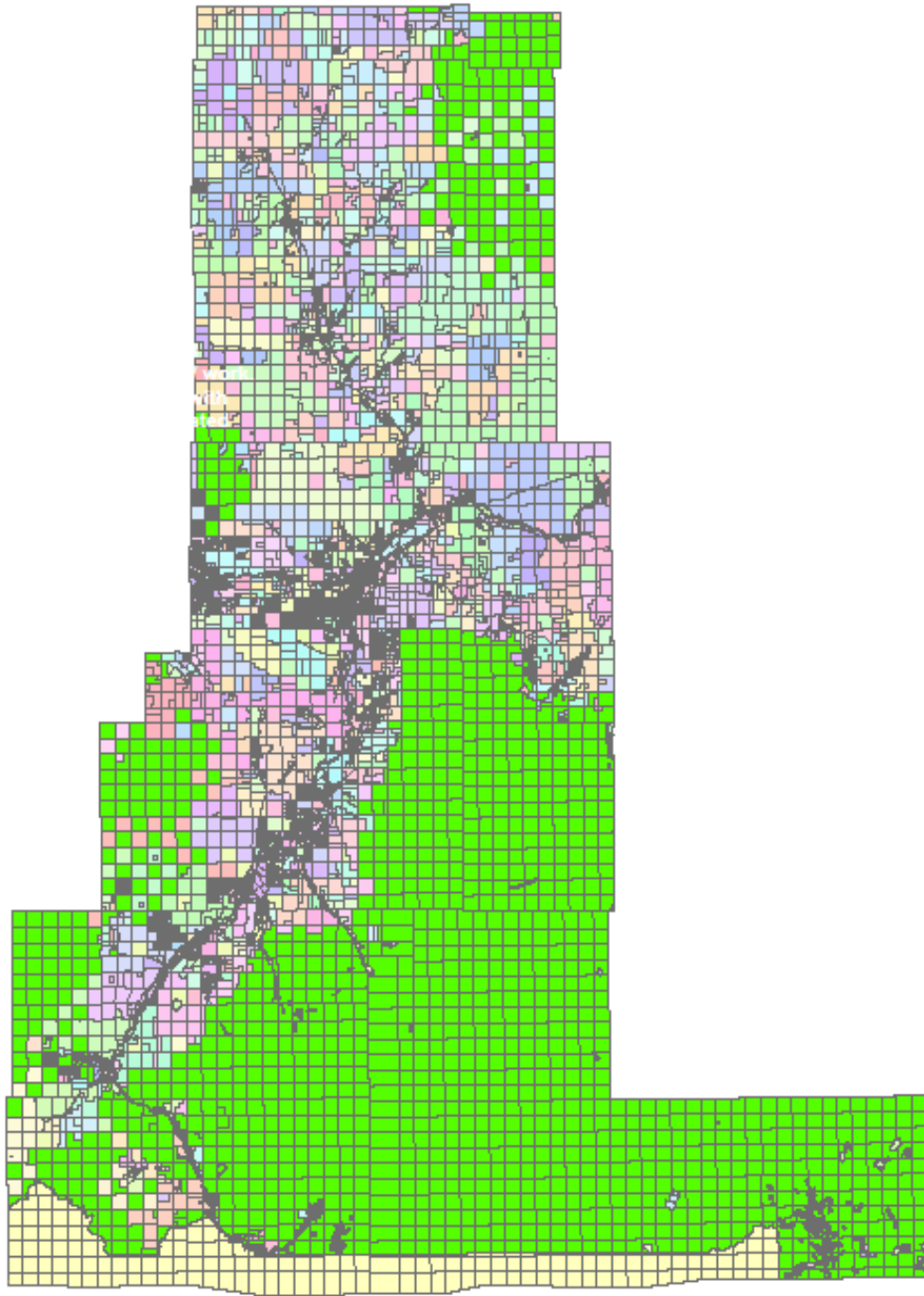


# Park County Community Wildfire Protection Plan



Park County land ownership

2014



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# Park County Community Wildfire Protection Plan 2014

## REVIEW AND APPROVAL

The Park County Community Wildfire Protection Plan has been reviewed and approved by the following Signatories:

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Prepared by: Jess Secret, Secret Fire Solutions LLC. 

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Chairperson, Park County Commissioners

---

Park County Fire Warden

---

Chief - Clyde Park Rural Fire District

---

Chief – Cook City/ Silver Gate Rural Fire District

---

Chief – Gardiner Fire District/ Gateway Hose Company

---

Chief – Paradise Valley Fee Service Area

---

Chief – Rural # 1 Fire District

---

Chief – Wilsall Fire District

---

Forest Supervisor – Custer Gallatin National Forest

---

Superintendent - Yellowstone National Park

---

DNRC Bozeman Unit Manager

---

BLM – Field Manager, Butte Field Office

# Park County Community Wildfire Protection Plan 2014

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# Park County Community Wildfire Protection Plan 2014

## EXECUTIVE SUMMARY

The 2014 Community Wildfire Protection Plan (CWPP) for Park County, Montana has been developed through a contract between Secret Fire Solutions, LLC and Park County. The 2014 CWPP is a rewrite and update of the 2006 Park County CWPP. The 2006 Park County CWPP was prepared by Jen Wilke and Eric Morris of Elkhorn Fire Management with input from a volunteer nine-member steering committee: Bob Fry, Carrie Shockley, Ron Archuleta, Craig Campbell, Josh Keller, Diana Allen, Jim Dugan, Terina Mullen, and Paula Rosenthal. The 2006 Park County CWPP was the culmination of an eleven-month effort to bring together concerned residents, business owners, emergency responders, private and public land managers, and other local stakeholders. Through public meetings, workshops, and community assessments, the original CWPP made the following accomplishments:

- Identification of values-at-risk due to a wildfire.
- Presentation of attainable solutions to mitigate risk through a range of efforts including prevention through education, preparedness and planning, suppression, fuel reduction, community assistance, restoration and rehabilitation, and effective cooperation between land management agencies.
- Formulation of a predetermined set of criteria to identify wildfire risk
- Prioritization of mitigation projects using assessment outcomes
- Identification of factors leading to wildfire-caused structure loss and offering strategies to reduce ignitability.

The Park County CWPP was updated in 2009 by the Park County Fire Warden's Office. This update contained a 'snapshot' of efforts measured against the original goals and strategies produced by the 2006 CWPP, and is intended to identify specific successes as well as areas that need increased attention.

The need to rewrite the Park County CWPP stems from changing fuel conditions within the county due to the increased activity of insects and pathogens (Mountain Pine Beetle, Spruce Bud Worm, White Pine Blister Rust and others). Additionally, climate changes have weather patterns that are contributing to longer and more active fire seasons, while structures continue to be built in the Wildland Urban Interface (WUI). The updated CWPP takes these evolving circumstances into account.

The focus of the 2014 rewrite and update of the Park County CWPP will be to assess the present situation with a wildfire assessment including wildfire history, updated fuel models, historic fire regimes, values at risk. Additionally, the new CWPP will include an updated assessment of emergency egress routes in need of hazard mitigations, a clear definition of WUI in the local landscape, an explanation of weather's relationship to wildfires, and a prioritization of specific fuel reduction areas and or projects. The education of private land/structure owners of the risk, their responsibilities and

# Park County Community Wildfire Protection Plan 2014

processes they need to follow if they live or own property in the “WUI” will be emphasized.

## Purpose Statement

The purpose of the CWPP is to generate management recommendations for protecting values at risk from wildfire in the WUI. The primary values at risk are lives, homes, businesses, and essential infrastructure (e.g., egress routes, municipal water supply structures, and major power and communication lines), but appropriate consideration is also given to other community values. The intent is to create a collaborative relationship between Park County and other levels of government to foster an effective, proactive program that will reduce the adverse impacts of wildfire in our communities.

This CWPP accomplishes several components of Park County's overall WUI program:

1. Identifying values at risk due to wildfire.
2. Identifying objectives.
3. Offering solutions to mitigate risk through a range of efforts including prevention through education, preparedness and planning, suppression, fuel reduction, community assistance, restoration and rehabilitation, and effective cooperation between land management agencies.
4. Using a common criteria to identify risk for all areas.
5. Identification and prioritization of specific fuel reduction areas and/or projects.
6. Identifying structures most at risk from wildland fire and offering strategies to reduce ignitability.

## Overview

The Wildland-Urban Interface, or WUI, is a unique zone of suburban development within or at the edge of forest or grassland areas. Any area where structures meet or intermingle with wildland fuel is an area with potential for an increased risk from wildfire. Characteristics that make the WUI an attractive area to live in (seclusion, remote location, and abundant vegetation) also make firefighting and emergency response dangerous, difficult, and very expensive. To make matters worse, a buildup of vegetation, resulting from decades of fire suppression, combined with recent drought have increased the probability of high intensity wildfires in many areas of the WUI. Through the development of a CWPP, Park County aims to reduce the risk of high intensity wildfire and its potential consequences in the WUI.

The CWPP is a tool designed by and for at-risk WUI communities to pre-plan and improve their capability to negate and/or survive wildfire. The United States Healthy Forests Restoration Act of 2003 (HFRA) encourages the development of CWPPs. Section 101(3) describes a CWPP as a plan that:



# Park County Community Wildfire Protection Plan 2014

1. Is developed in the context of the collaborative agreements and guidance established by the Wildland Fire Leadership Council and agreed to by the local government, local fire department, and state agency responsible for forest management, in consultation with interested parties and the federal land management agencies that manage land in the vicinity of an at-risk community.
2. Identifies and sets priorities for areas needing hazardous fuel reduction treatments and recommends the types and methods of treatment on federal and non-federal lands that will protect one or more at-risk communities and their essential infrastructure.
3. Recommends measures to reduce the chance that a fire will ignite structures throughout an at-risk community.

## VALUES AT RISK

During development of the 2006 CWPP, community meetings were held to involve the public in the process and gather their input. These values are what our communities' value as worth of protection from wildfire:

- **Public and Firefighter Safety** – Human life is the most important thing we can protect. Fire suppression activities and evacuation of people during a wildfire can be dangerous, especially in places where fuel have been accumulating for decades.
- **Property** – Homes, buildings, land, and equipment are things every Montanan works hard for.
- **Infrastructure** – Hospitals, emergency services, schools, utilities, transportation and businesses.
- **Air quality** – Good air quality is one aspect that draws people to Montana and keeps them here. Recent high fire years have put dangerous levels of smoke and particulates in the air that can cause breathing problems for many during fire season.
- **Water quality** – Wildfire can devastate streams and municipal watersheds with sediment transported by runoff from erosion. This can, in turn, cause water shortages for fisheries and people.
- **Recreation** – Hunting, fishing, hiking, camping, nature photography, snowmobiling, skiing and rafting are just of the few activities that can be significantly diminished by wildfire and can be stopped due to closures when large wildfires occur.
- **Economics/Tourism** – A loss of visitors (Yellowstone National Park, rivers, campsites, etc.,) means a loss of revenue to many of the County's communities and businesses.
- **Wildlife** – Montana's wildlife diversity is amazing. While some habitats are improved by fire, others are destroyed and can take years to recover.
- **Flora** – Many native species can be muscled out by invasive species, which can

# Park County Community Wildfire Protection Plan 2014

take advantage of wildfires to spread.

- **Aesthetics** – Many people visit and move to Montana for its scenery. Wildfire can devastate the landscape, which can take years to recover.
- **Cultural/Historical** – Montana has a rich history of being the “West.” There are many ‘Historical’ sites and buildings, and archeological sites can be found throughout the county. Many of these irreplaceable resources are at risk from wildfire, but can also be damaged by fire suppression efforts.

## OBJECTIVES

This section is focused on what can be done to reduce those risks using broad goals and general tasks.

The 10 year National Fire Plan has 4 primary goals:

1. Improve Prevention and Suppression
2. Reduce Hazardous Fuel
3. Restore Fire Adapted Ecosystems
4. Promote Community Assistance

The goals within this plan have the same direction as those in the National Fire Plan.

1. Program Development
2. Prevention
3. Community Assistance
4. Preparedness/Planning
5. Suppression
6. Reducing Hazardous Fuel

Within these 6 categories, 7 goals have been defined. Tasks have been developed to accomplish each goal. These tasks are not all-inclusive. As new ideas are developed to accomplish the goals, they should be added to this plan and implemented.

## PROGRAM DEVELOPMENT

The stakeholders believe in this program and want to include every resident in every community. This is a large task and needs leadership, direction and agency cooperation.

### **Goal 1: Build and sustain a county-wide effort that promotes the evolving goals within this plan.**

Tasks

- The Park County Local Emergency Planning Committee (LEPC) will provide oversight to the Park County FireSafe Coalition (PCFSC) along with local

# Park County Community Wildfire Protection Plan 2014

stakeholders and fire chiefs to implementing this plan's goals

- Hold meetings to ensure the plan's success.
- Periodically evaluate the appropriateness of the goals and tasks within this plan.
- Update and document the accomplishments of the program in the Park County CWPP.
- Locate and secure funds to manage the implementation of the CWPP.

## **Goal 2: Provide for effective cooperation of government resources on the priority areas identified by the community.**

Tasks:

- Coordinate mitigation efforts so that all work will be more effective.
- Map (utilizing GIS) all accomplished treatments, by all land management agencies, into one accurate, updated data base.
- Develop a local Type 3 Incident Command team, or pool of qualified personnel, utilizing members of all agencies (county, state and federal). Work with neighboring counties whenever necessary.

## PREVENTION

This plan has noted that suppression of fires has had a negative impact on the current state of the Wildland Urban Interface. However, it is still true that we need to continue to prevent fires to save the things we value most. Local land and home owners need to understand the threats and take action themselves. To that end, this objective focuses on prevention through education.

## **Goal 3: Raise community awareness of the issues and solutions for living in the wildland urban interface.**

Tasks:

- Use the READY, SET, GO! Montana Wildland Fire Action program as the primary public information tool.
- Use FireSafe Montana and Firewise® Communities Programs in a collaborative fashion to compliment the Ready Set Go program.
- Attend homeowner meetings and provide information on assistance available for reducing the threat of wildfire.
- Develop and support FireSafe Neighborhood Community Groups (homeowner groups).
- Develop set criteria to be recognized as a Firewise Community
- Promote and participate in inter-organizational sponsored prevention events.
- Use rural addressing to target homeowners in priority areas.
- Support fire prevention programs in Park County schools. Coordinate with the Park County FireSafe Coalition (PCFSC) and local Volunteer Fire Districts.
- Set up an information booth at community events, such as farmers' markets,

# Park County Community Wildfire Protection Plan 2014

- rodeos, volunteer fire department fund raisers, etc.
- Review the county subdivision regulations and advise revisions that will promote fire safety.
- Collaborate with land management agencies to improve the fire resilience of forested lands
- Promote fire-resistant building materials and maintenance regulations; address access issues and recommend vegetation manipulation where necessary. .
- Park County FireSafe Coalition (PCFSC) will be responsible for developing a presentation for builders, realtors and government officials to help them understand their part in reducing wildfire risk in the WUI
- Maintain a web site (<http://firereadyparkcounty.org/>) that promotes the ideas within this plan.

## COMMUNITY ASSISTANCE

The easier this plan and resulting programs makes implementation, the more willing landowners will be to take part. Tasks in this category focus on helping the public through cost-share programs, and/or grants.

### **Goal 4: Assist local home and landowners in locating and securing resources for reducing risk.**

#### Tasks:

- Use the Ready Set Go program as the informational tool as to what homeowners need to do to live in the wildland-urban interface
- Use the local volunteer fire departments as the next informational source for information on Firewise (fuel mitigation).
- Use the Resource Conservation and Development (RC&D) Hazardous Fuel Reduction Grant Program for technical assistance for landowners who want to develop and implement (funding) a hazardous fuel mitigation plan or a forest stewardship plan. (Contact Brad Bauer phone 1-406-388-3213, [brad.bauer@montana.edu](mailto:brad.bauer@montana.edu) or <http://www.msuextension.org/gallatin/naturalresourcesfire.html> )
- Continue to develop and utilize the Park County fuel reduction program. If funding is available, support a county fuel reduction crew.
- Utilize BLM fuel reduction program grants. Coordinate through Park County Fire Warden.
- Encourage homeowners to recruit other homeowners.
- Continually seek out and secure other funds to implement fuel mitigation.

## PREPAREDNESS/PLANNING

While there is no way to prevent all fires from occurring, emergency personnel can be prepared to act when a fire does happen. Goal 5 and its subsequent tasks are aimed at strategic planning and identifying, pre-incident, the actions to be taken when wildfire

# Park County Community Wildfire Protection Plan 2014

strikes. This goal also focuses on area evaluation and information gathering as a tool for strategy and tactics.

## **Goal 5: Plan strategically for Wildland fire events in the WUI and county.**

### *Tasks:*

- Use the rural addressing system to develop the following plans for each fire district, subdivision, or priority area:
  - Population Protection plans
    - Home assessment plans: each property is mapped, evaluated, rated and pictured for reference; area ratings developed (subdivisions, drainages etc.).
    - Pre-incident plans: area is mapped; areas are identified for water sources, drop points, ICP, etc.; agreements for use documented and signed; areas of particular concern are noted and mapped.
- Utilize an electronic mapping and planning system.
- Work toward the goal of equipping each fire department with an electronic mapping system with directional capability in one of its response vehicles. These electronic systems will be pre-loaded with population protection plans and home assessments.

## SUPPRESSION

Within this plan area, there are nine fire districts, departments, or service areas that have protection responsibilities (see Appendix Park County Rural Fire Department / Service (districts) areas information). They should be able to function together effortlessly. All these organizations should be adequately staffed, well trained and have the equipment needed to respond to all calls.

## **Goal 6: Assist fire protection organizations in acquiring the appropriate resources to maintain and improve protection from wildfires throughout the county.**

### Tasks:

- Actively recruit new volunteers for all districts (see Appendix Park County Rural Fire Department / Service (districts) Areas Contact and Fire Department Information for current numbers.)
- Provide quality assignments and NWCG certified training courses to every firefighter regardless of fire district.
- Locate and secure funding for maintaining and upgrading equipment.
- Evaluate individual fire districts for deficiencies and respond accordingly.
- Use Ready Set Go workshops to inform homeowners of what they need to do and not do when a wildfire occurs in their area. Ensure they know what the local fire department needs them to do in the event of an emergency.
- Educate the public of the need for situational awareness in determining their

# Park County Community Wildfire Protection Plan 2014

own safety and/or if they need to take actions to mitigate a risk.

- Educate fire department, county personal and homeowners of what an Incident Management Team (IMT) will provide and do when managing a wildfire or other incident.

## REDUCING HAZARDOUS FUEL

As noted earlier, because of the persistent and successful suppression measures of the last century, the level of wildland fuel has increased substantially in many areas. More people are developing property in the WUI because of the rural lifestyle and natural beauty it offers. To lessen the fire hazard and reduce the risk to people and property in the WUI, there must be a change in the arrangement of fuel, or a removal of fuel. This is commonly referred to as “Fuel Reduction,” or “Fuel Mitigation.” This goal focuses on building a program that uses fuel reduction strategies as effectively as possible.

### **Goal 7: Identify and prioritize WUI areas and use fuel reduction strategies to reduce the risk in those areas.**

Tasks:

- Use wildfire assessment mapping along with on-the-ground identification by local fire district personal, homeowners and other stake holders to determine priority treatment areas and projects.
- Prioritize these areas and projects to submit for funding and to schedule mitigation work.
- Identify and prioritize egress routes with adjacent hazardous fuel needing mitigation.
- Collaborate with all land management agencies in identifying and prioritizing areas.
- Coordinate funding from the RC&D Hazardous Fuel Reduction Grant Program, Park County fuel reduction program, and the BLM fuel reduction program grants.
- Recruit home and property owners.
- Work with homeowner groups to collaborate on the mitigation work.
- Locate and secure funds (grants, cost share, etc.) for mitigation work.
- Promote an expansion of mitigation resources to accomplish fuel reduction work (county fuel mitigation crew).
- Record all accomplishments and periodically add them to this CWPP.
- Update and reprioritize work in this CWPP as new data is received (fuel types, fire starts, accomplishments, new federal directives, etc.)
- Develop and maintain a GIS mapping layer that is accessible and updatable by all agencies.

These 7 goals and the associated tasks support the directives of the National Fire Plan and the 10 Year Comprehensive Strategy. As policy changes or is updated, these objectives and tasks will be reviewed and/or revised. Tasks will be continually added and implemented as needed.

# Park County Community Wildfire Protection Plan 2014

## WILDFIRE ASSESSMENT

Areas Addressed by this Assessment:

- Fire History: Ignitions and Large fires
- Fuel Models
- Fire Regime and Condition Classes
- Values at Risk
- Emergency Egress Roads
- Park County's Wildland Urban Interface Area
- Fire Weather and its Relation to Wildfires
- Prioritization of hazardous fuel mitigation areas

This assessment looks at conditions within Park County to determine the risk to values and to help prioritize areas for hazardous fuel mitigation. The history of recorded fires, the ignition patterns, weather, topography, aspect and vegetation are all very important factors when determining the risk of a wildfire. Important tools available in Park County for evaluating wildfires include maps of past ignitions and large fire history, fuel models, vegetative fire regime and condition classes, and values at risk (structures). A brief discussion of fire weather and its relationship to wildfires analysis will also help illustrate the interconnected nature of the risk factors and the analysis tools.

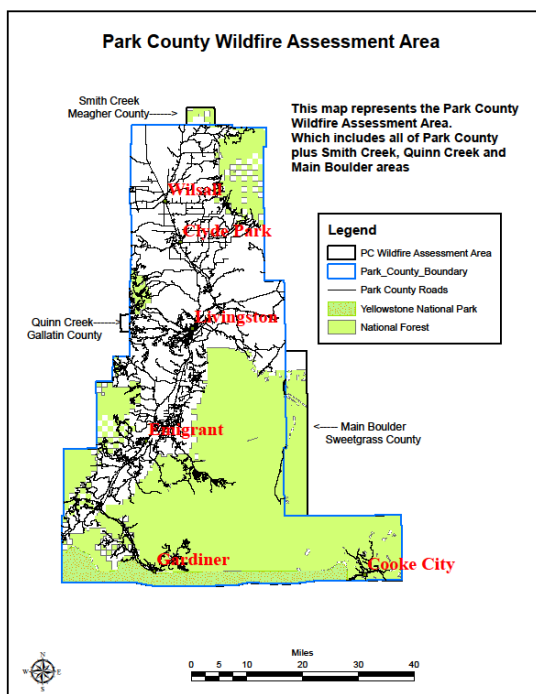
### Areas addressed by this assessment

The assessment area includes all of Park County and the following areas just outside Park County, which are included because of access and response issues. They are noted on this map. **Smith Creek** – This drainage is north of Park County in Meagher County.

It was concluded that because Park County Volunteers are the first to respond to this area and firefighter safety is the highest priority, it would be included in both Meagher and Park County CWPPs.

**Quinn Creek** – This area is located in Gallatin and Park County. Both counties are working together to include all area residents.

**Main Boulder** – The road accessing this area wanders between Sweet Grass and Park Counties. The Sweet Grass County CWPP includes this area and designates the WUI boundary. Both counties have agreed to work together in this drainage. Contact is the Sweet Grass Conservation District (phone # 932-5160). “(See Park County Wildfire Assessment Area Map” Appendix-Maps for page size map)



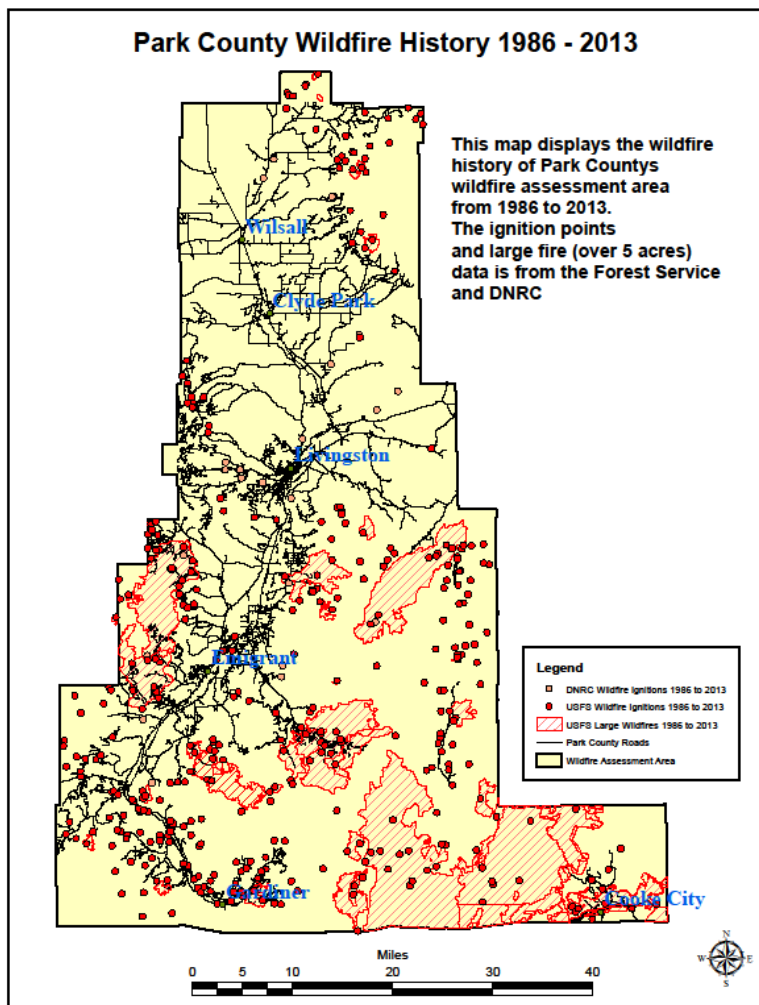
# Park County Community Wildfire Protection Plan 2014

## Fire History: Ignitions and Large fires

**Fire Ignitions** Past fire ignitions give fire managers clues as to where there is a greater chance for future fire starts. These ignitions vary greatly and can either result from natural or human causes. Some areas receive more lightning activity due to frequent storms or magnetic attraction. Human starts are normally related to the occurrence of dwellings, roads and recreational activities.

**Fire History** Fire history maps of Park County allow fire managers to quickly see where past fires have occurred. While these maps give important information on the fuel based on how long ago a fire burned, they are not always accurate indicators of the intensity of the burn or the fuel remaining today.

### Wildfires 1986 to 2013



Cause	# of Fires
Lighting	253
Equipment	2
Smoking	7
Campfire	74
Debris Burning	12
Railroad	4
Arson	0
Children	2
Miscellaneous	36
<b>TOTAL</b>	<b>390</b>

The fire history data is from the Forest Service and DNRC. There may be local county fires that are not represented on the map or statics.

“(See Park County Wildfire History Map” Appendix-Maps for page size map)

### Park County Large Fire (100 acres or greater) Year 1986 to 2013



## Park County Community Wildfire Protection Plan 2014

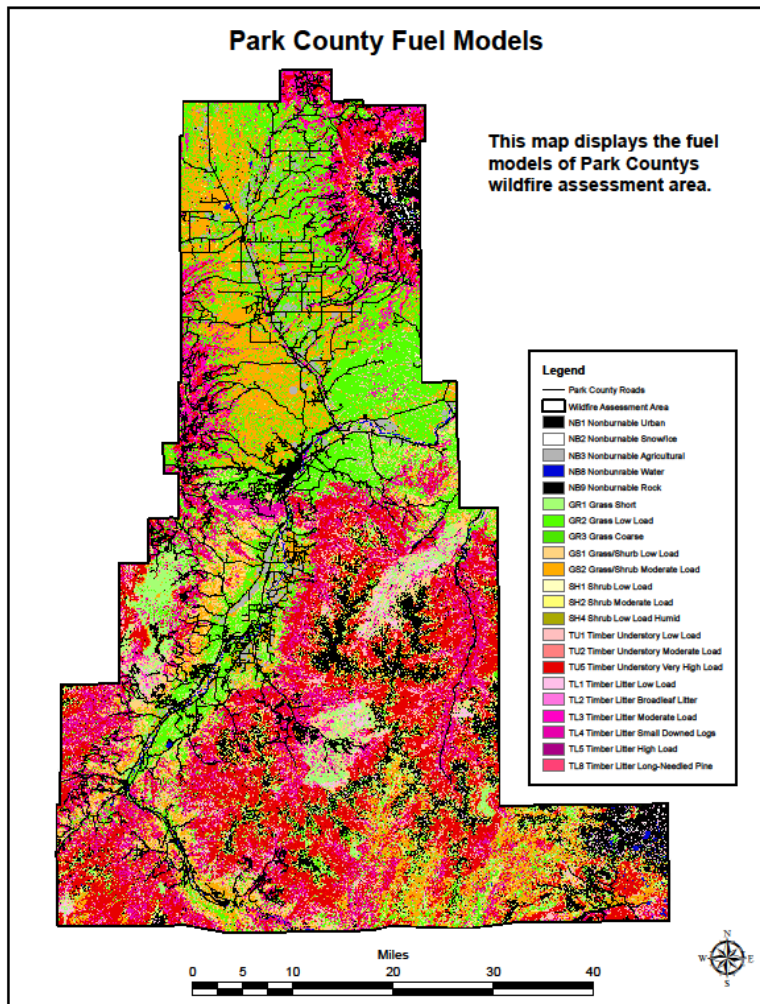
FIRE NAME	YEAR	CAUSE	ACRES	AGENCY
SHEEP MOUNTAIN	1985	Lightning	761	DNRC
HELLROARING	1988	Campfire	81890	USFS
CLOVER/MIST	1988	Miscellaneous	387400	NPS
STORM CREEK	1988	Miscellaneous	56856	USFS
SIX MILE	1989	Lightning	385	USFS
THOMPSON CREEK	1991	Lightning	7746	USFS
LIVINGSTON/RAILROAD	1991	Railroads	379	DNRC
EIGHTMILE	1994	Lightning	33	USFS
DECKARD FLATS	1994	Lightning	2200	USFS
SMITH CREEK	1994	Lightning	1440	USFS
WILLOW CK.	1994	Lightning	620	DNRC
ELK CREEK	1994	Debris Burning	700	DNRC
COYOTE PNF	1996	Lightning	4283	NPS
I-90	1996	Railroads	600	DNRC
AREA CREEK	1996	Railroads	300	DNRC
WINEGLASS	1996	Miscellaneous	420	DNRC
SIX MILE	1999	Miscellaneous	1202	USFS
SUGARLOAF	2000	Lightning	400	USFS
HOPPE	2001	Lightning	550	USFS
MONITOR	2001	Lightning	420	USFS
MONUMENT	2001	Lightning	2560	USFS
FRIDLEY	2001	Lightning	26873	USFS
LITTLE JOE	2001	Miscellaneous	860	USFS
ROUGH DRAW	2003	Lightning	1029	USFS
BRUNDAGE	2003	Lightning	3200	USFS
SLIPPERY CREEK	2003	Lightning	1072	USFS
BIG CREEK	2006	Lightning	14000	DNRC
JUNGLE	2006	Lightning	25828	USFS
PASSAGE FALLS	2006	Lightning	6620	USFS
SOUTH PINE	2006	Lightning	788	USFS
HICKS PARK	2007	Lightning	2500	USFS
PORCUPINE	2007	Lightning	124	USFS
WICKED CREEK	2007	Lightning	26600	USFS
BULL	2011	Lightning	1163.9	USFS
PINE CREEK	2012	Equipment	8612	DNRC
PARADISE VALLEY	2012	Miscellaneous	1000	DNRC
WILLOW CK.	2012	Lightning	1800	DNRC
EMIGRANT	2013	Lightning	10850	USFS
HORSETAIL	2013	Lightning	143	USFS
SHEEP CREEK	2013	Lightning	570	USFS
NORTH EIGHT MILE	2013	Lightning	414	USFS

### Fuel Models

# Park County Community Wildfire Protection Plan 2014

Fuel model maps help identify the type of wildland fuel in Park County. These maps were created using the LANDFIRE project data products, which were developed through integrating a collection of advanced scientific procedures, including relational databases, geo-referenced land-based plots, treatments, satellite-enabled remote sensing, systems ecology, gradient a predictive landscape modeling, and vegetation and disturbance dynamics. Fuel models are used in fire behavior modeling programs to determine fire behavior factors. Some fuel models will cause more active fire behavior (flame length, intensity). These fuel models should be targets for mitigation if they are in proximity to

values at risk or egress routes. Refer to Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model by Joe H. Scott, and Robert E. Burgan.



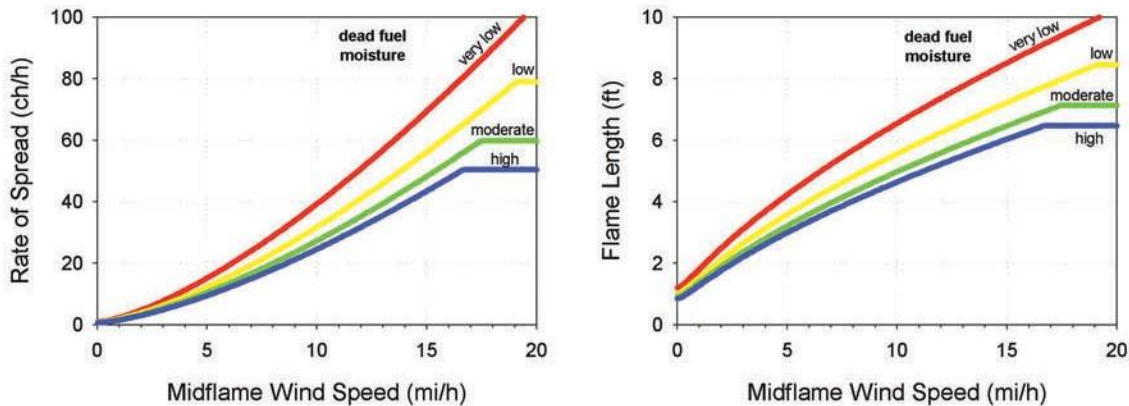
([http://www.fs.fed.us/rm/pubs/rmrs\\_gtr153.pdf](http://www.fs.fed.us/rm/pubs/rmrs_gtr153.pdf)) for information and description. (See "Park County Fuel Model Map" Appendix-Maps for page size map)

# Park County Community Wildfire Protection Plan 2014

The fuel models of extra concern in Park County are ones that have potential fire behavior of rates of spread and flame lengths that individually or in combination are moderate to high. Two fuel models of concern in Park County are TU2 Timber-Understory, TU5 Timber-Understory and TL8 Timber-Litter.

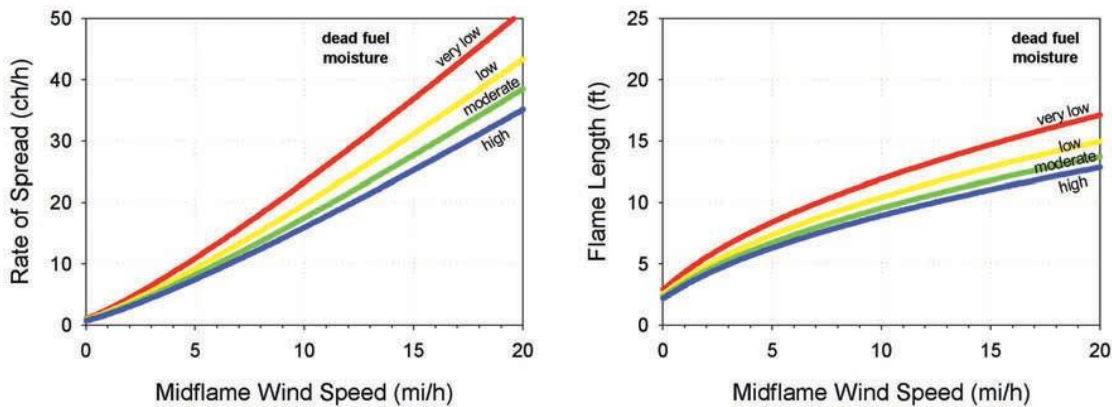
TU2 Moderate Load, Humid Climate Timber-Shrub

**Description:** The primary carrier of fire in TU2 is moderate litter load with shrub component. High extinction moisture; spread rate is moderate; flame length low.



TU5 Timber-Understory Very High Load, Dry Climate Timber-Shrub

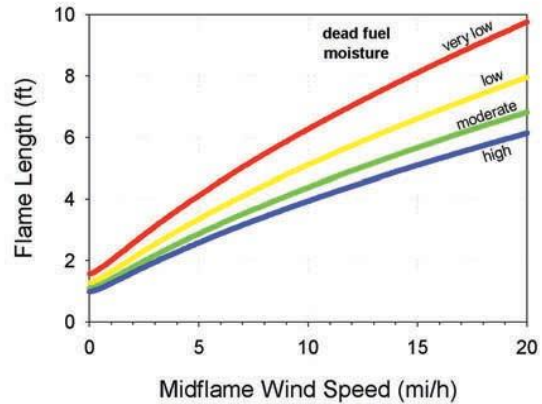
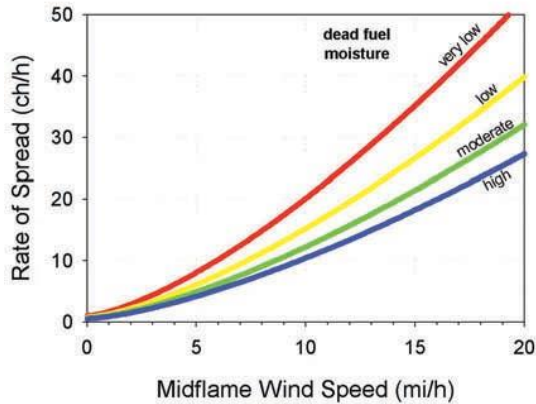
**Description:** The primary carrier of fire in TU5 is heavy forest litter with a shrub or small tree understory. Spread rate is moderate; flame length moderate.



# Park County Community Wildfire Protection Plan 2014

## TL8 Timber-Litter Long Needled Litter

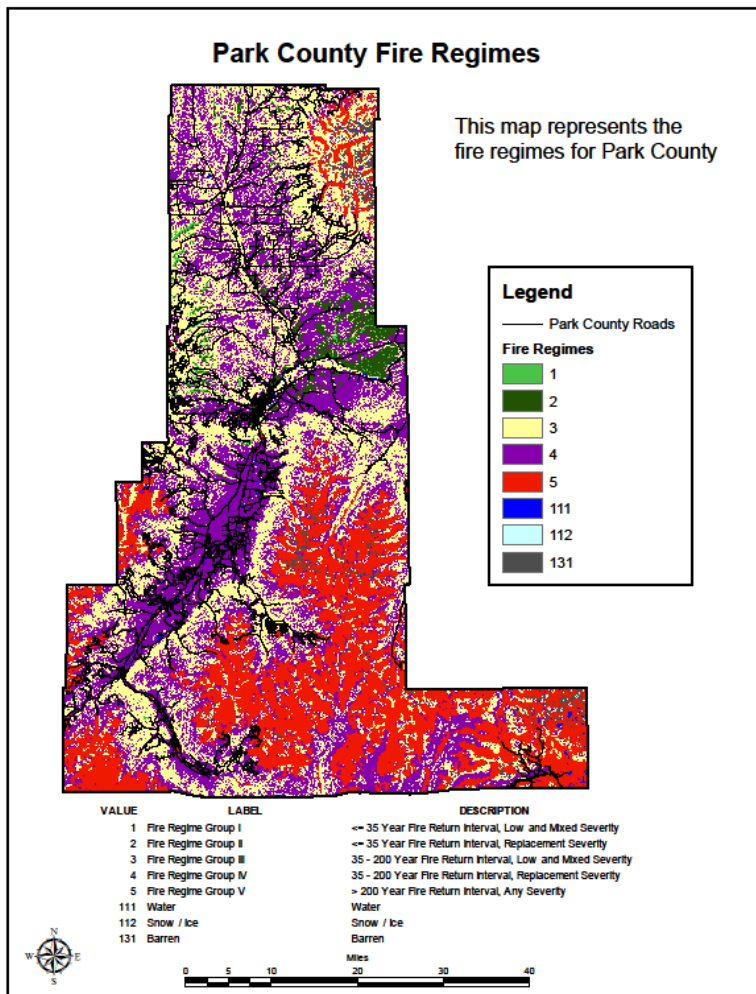
**Description:** The primary carrier of fire in TL8 is moderate load long-needle pine litter which may include a small amount of herbaceous load. Spread rate is moderate; flame length low.



# Park County Community Wildfire Protection Plan 2014

## Fire Regime and Condition Classes

Fire regimes and condition classes are important factors in identifying the potential range of forest conditions that can occur on a landscape, and in understanding the influence of historical disturbance regimes on vegetation structure, species composition and spatial distribution. Some of the common disturbance regimes within North America include fire, insects, disease, hurricanes, blow down and flooding. Within any given landscape, several different historic disturbance regimes may have operated to influence vegetation in this manner.



In Park County, fire was the primary disturbance agent in the landscape, directly influencing large-scale changes in forest species composition, structure and spatial distribution. Insects and disease are also an important component of the disturbance agents, and their activities often contribute to the occurrence and severity of fire.. However, human-induced changes and their impact have functionally suppressed, eliminated or changed many of the historical disturbance regimes throughout the west, and Park County is no exception. Effective fire suppression in Park County changed the historical structure of many forest stands.

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993, Brown 1995). Coarse-scale definitions for natural (historical) fire regimes have been developed by Hardy et al. (2001) and Schmidt et al. (2002) and interpreted for fire and fuel management by Hann and Bunnell (2001). The five natural (historical) fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. These five regimes include:

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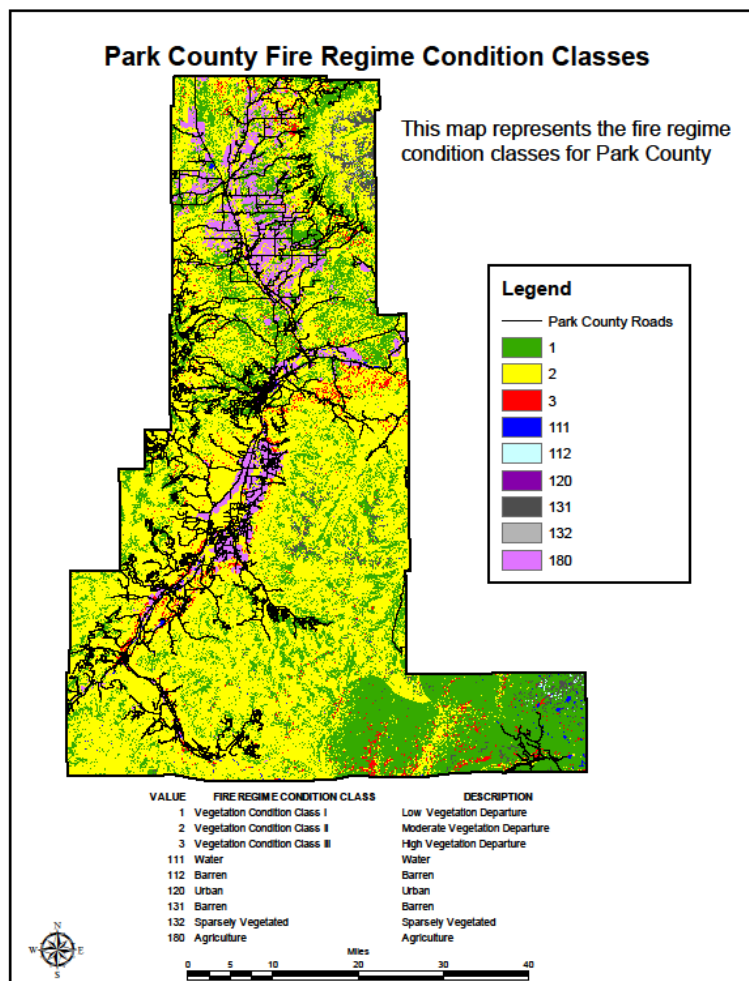
I – 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75% of the dominant overstory vegetation replaced);

II – 0-35 year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);

III – 35-100+ year frequency and mixed severity (less than 75% of the dominant overstory vegetation replaced);

IV – 35-100+ year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);

V – 200+ year frequency and high (stand replacement) severity.



As scale of application becomes finer, these five classes may be defined with more detail, or any one class may be split into finer classes, but the hierarchy of the coarse-scale definitions should be retained.

A fire regime condition class (FRCC) is a classification of the amount of departure from the natural regime (Hann and Bunnell 2001). Coarse-scale FRCC classes have been defined and mapped by Hardy et al. (2001) and Schmidt et al. (2001) (FRCC). They include three condition classes for each fire regime. The classification is based on a relative measure describing the degree of departure from the historical natural fire regime. This departure results in changes to one (or more) of the following ecological components: vegetation characteristics (species

composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g. insect and disease mortality, grazing, and drought). There are no wildland vegetation and fuel conditions or wildland fire situations that do not fit within one of the three classes.

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Fire Regime Condition Class	Description	Potential Risks
Condition Class 1	Within the natural (historical) range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances	Fire behavior, effects, and other associated disturbances are similar to those that occurred prior to fire exclusion (suppression) and other types of management that do not mimic the natural fire regime and associated vegetation and fuel characteristics. Composition and structure of vegetation and fuel are similar to the natural (historical) regime. Risk of loss of key ecosystem components (e.g. native species, large trees, and soil) are low.
Condition Class 2	Moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances	Fire behavior, effects, and other associated disturbances are moderately departed (more or less severe). Composition and structure of vegetation and fuel are moderately altered. Uncharacteristic conditions range from low to moderate; Risk of loss of key ecosystem components are moderate.
Condition Class 3	High departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances	Fire behavior, effects, and other associated disturbances are highly departed (more or less severe). Composition and structure of vegetation and fuel are highly altered. Uncharacteristic conditions range from moderate to high. Risk of loss of key ecosystem components are high.

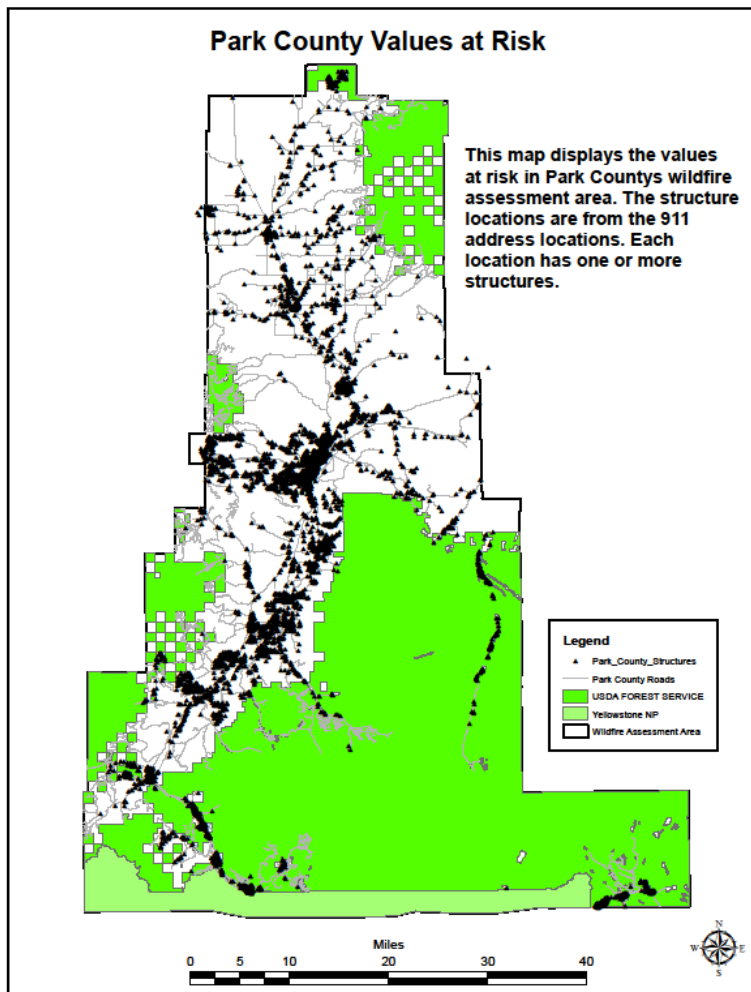
The central tendency is a composite estimate of vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated natural disturbances. Low departure is considered to be within the natural (historical) range of variability, while moderate and high departures are outside.

When assessing fuel mitigation projects associated with values at risk and/or egress routes, areas that are in fire regimes 1-4 and condition class 2 or 3 may be areas of concern.

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## Values at Risk

Values at Risk include property, structures or structure complex locations (including communication sites), physical improvements, natural and culture resources, community infrastructure, and economic, environmental, and social values. 911



address structure location data was used to create a values at risk map. Each structure point represents at least one structure and can represent many depending on the number of structures associated with an address location. Power and other transmission lines are not displayed.

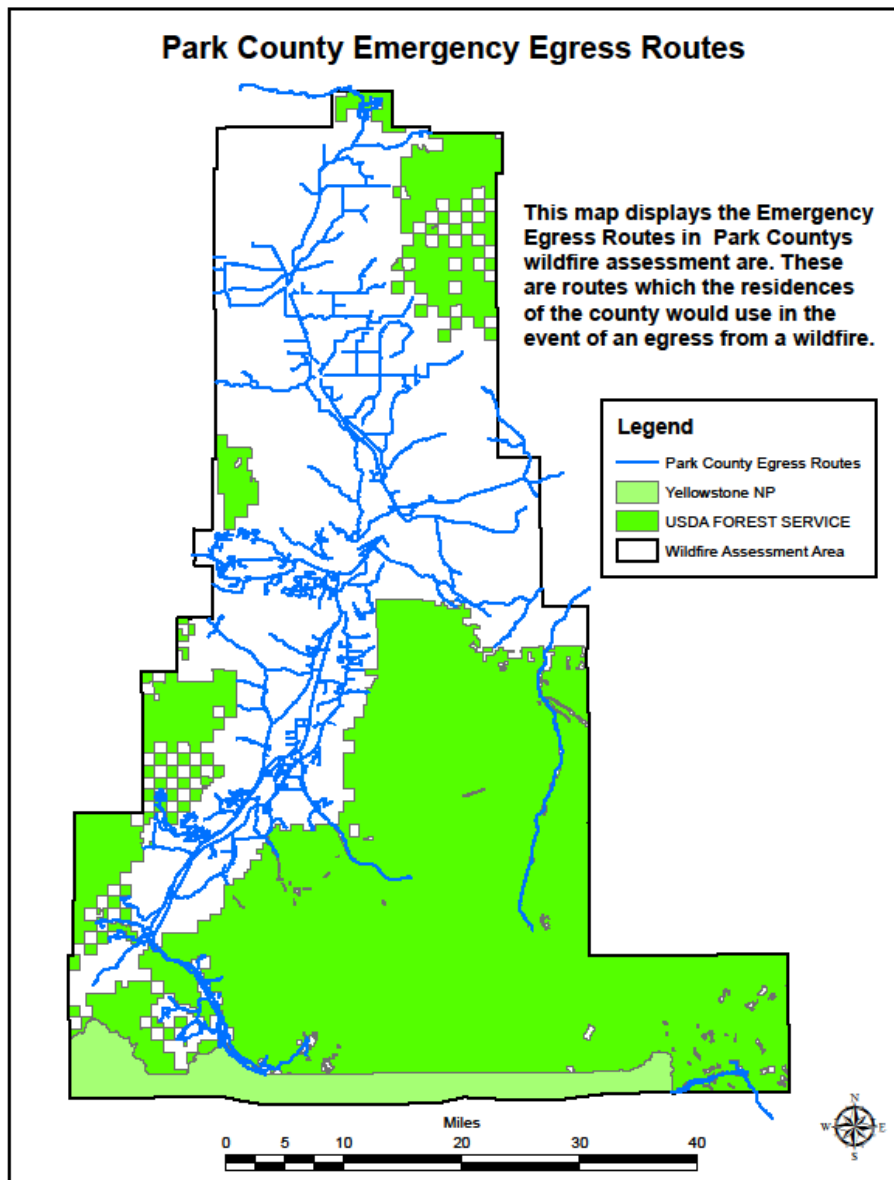
(See "Park County Values at Risk Map" Appendix-Maps for page size map)



# Park County Community Wildfire Protection Plan 2014

## Emergency Egress Routes

Multiple ingress and egress routes are critical to public safety. Egress is needed for residents to evacuate and ingress required for emergency services. The identification of ingress/egress routes in the Park County CWPP is for the propose of the identification of hazard (fuel mitigation) reduction needs along these routes. The



identification of ingress/egress routes during an emergency incident will be determined at the time of an incident with the incident specific factors taken into consideration. It is critical that all roadways be treated to reduce fuel volumes along major ingress/egress routes. It may be possible, in the interim, to create small staging areas that can allow residents to remain temporarily when emergency services may be trying to enter the neighborhood. Efforts should be made to to see if alternate access is possible into areas with limited access Egress routes

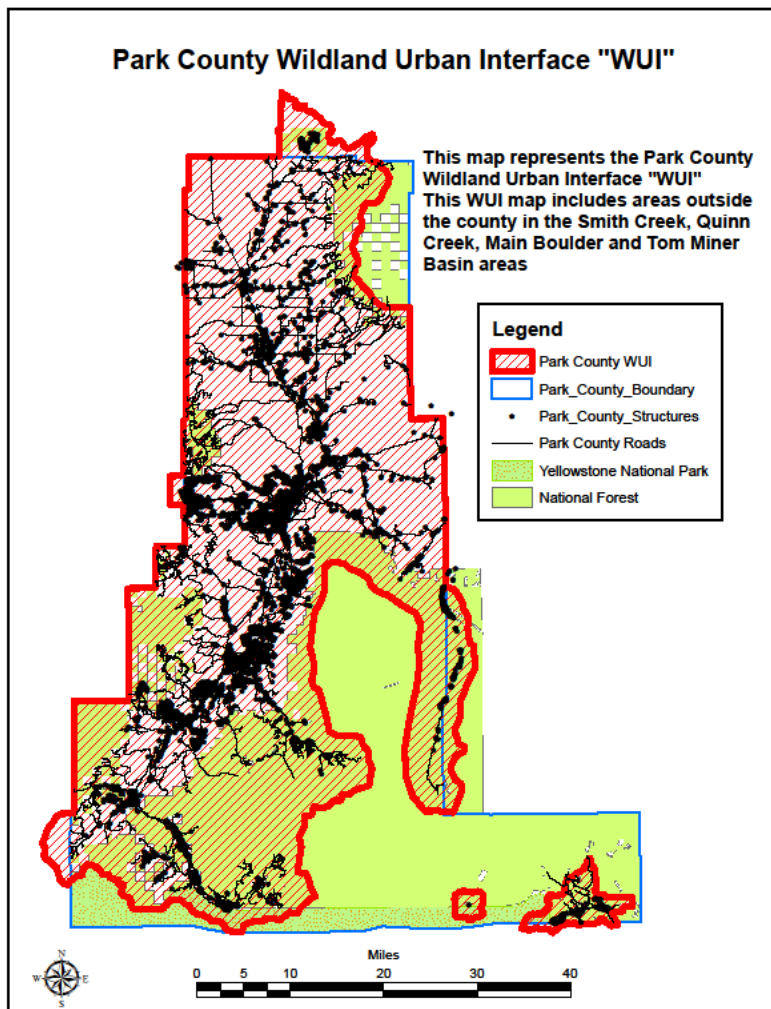
were identified and these routes were analyzed to determine which routes were in need of fuel mitigation. Some routes were identified as needing structural improvements also.

(See Park County Emergency Egress Routes Appendix-Maps for page size map)

# Park County Community Wildfire Protection Plan 2014

## Wildland Urban Interface "WUI"

The Wildland Urban Interface (WUI) has gained attention through efforts targeted at wildfire mitigation; however, this analysis technique is also useful when considering other hazards because the concept looks at where people and structures are concentrated in any particular region.



A key component in meeting the underlying need for protection of people and structures is the protection and treatment of hazards in the wildland-urban interface. The wildland-urban interface refers to areas where wildland vegetation meets urban developments or where forest fuel meet urban fuel such as houses. The WUI encompasses not only the interface (areas immediately adjacent to urban development), but also the surrounding vegetation and topography. Reducing the hazard in the wildland-urban interface requires the efforts of federal, state, and local agencies and private individuals. Structural fire protection during a wildfire in the wildland-urban interface is largely the responsibility of Tribal, state, and local governments. Property

owners share a responsibility to protect their residences and businesses and minimize danger by creating defensible areas around them and taking other measures to minimize the risks to their structures. With treatment, a wildland-urban interface can provide firefighters a defensible area from which to suppress wildland fires or defend communities against other hazard risks. In addition, a wildland-urban interface that is properly treated will be less likely to sustain a crown fire that enters or originates within it.

By reducing hazardous fuel loads, ladder fuel, and tree densities, and creating new and reinforcing existing defensible space, landowners can protect the wildland-urban interface, the biological resources of the management area, and adjacent property

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owners by:

- Minimizing the potential of high-severity ground or crown fires entering or leaving the area;
- Reducing the potential for firebrands (embers carried by the wind in front of the wildfire) impacting the WUI. Research indicates that flying sparks and embers (firebrands) from a crown fire can ignite additional wildfires as far as 1¼ miles away during periods of extreme fire weather and fire behavior;
- Improving defensible space in the immediate areas for suppression efforts in the event of wildland fire.

Three wildland-urban interface conditions have been identified (Federal Register 66(3), January 4, 2001) for use in wildfire control efforts. These include the Interface Condition, Intermix Condition, and Occluded Condition. Descriptions of each are as follows:

- **Interface Condition** – a situation where structures abut wildland fuel. There is a clear line of demarcation between the structures and the wildland fuel along roads or back fences. The development density for an interface condition is usually 3+ structures per acre;
- **Intermix Condition** – a situation where structures are scattered throughout a wildland area. There is no clear line of demarcation; the wildland fuel are continuous outside of and within the developed area. The development density in the intermix ranges from structures very close together to one structure per 40 acres; and
- **Occluded Condition** – a situation, normally within a city, where structures abut an island of wildland fuel (park or open space). There is a clear line of demarcation between the structures and the wildland fuel along roads and fences. The development density for an occluded condition is usually similar to that found in the interface condition and the occluded area is usually less than 1,000 acres in size.

In addition to these classifications detailed in the Federal Register, Park County has four additional classifications to augment these categories:

- **Rural Condition** – a situation where the scattered small clusters of structures (ranches, farms, resorts, or summer cabins) are exposed to wildland fuel. There may be miles between these clusters.
- **High Density Urban Areas** – those areas generally identified by the population density consistent with the location of incorporated cities, however, the boundary is not necessarily set by the location of city boundaries or urban growth boundaries; it is set by very high population densities (more than 7-10 structures per acre).
- **Non-WUI Condition** – a situation where the above definitions do not apply because of a lack of structures in an area or the absence of critical infrastructure. This classification is not considered part of the wildland urban interface.

Park County determined that all nonfederal land meets the WUI classifications. Federal land that is adjacent to nonfederal land where the potential for wildfire spread on to nonfederal land exists is also classified under WUI designation.

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The portion of federal land to be classified as WUI has been determined by looking at the potential rate of fire spread and the time needed to allow egress of the effected population and the ingress time of emergency response personal. Since the focus of attention is generally centered around crown fires and their effects on surrounding communities, for the sake of consistency, crown fire models will be used to determine the appropriate distance onto federal land. It is important to state that not all fires will become crown fires and, in most cases, will only affect the surface structure of the forest.

Crown fire data available to determine this distance is based upon only a few actual crown fires, which is taken from Rothermel's "Predicting Behavior and Size of Crown Fires in the Northern Rocky Mountains (1991)." With data available the following two methodologies are offered:

Number One:

- The crown runs studied by Rothermel had a duration time of two to five hours. To calculate an average rate of spread between the different fires, all seven of the times were added together then divided by the total number of fires analyzed. Resulting in the following calculation:

$$\frac{(5+2+4+3+3+.83+4+2.5)}{7} = 3.5 \text{ hours.}$$

- The forward rate of spread was also reached through the same process as previously stated. The sum of the seven fires observed rate of spread per hour was divided by the total number of fires analyzed, once again that being seven.  $(1.4+3.0+.52+.92+1.04+1.56+.55+0.55) \div 7 = 1.4 \text{ miles per hour}$

Therefore using these calculations in the following formula:

$$(3.5 \text{ hours avg duration of crown fire} \times 1.4 \text{ mph spread rate}) = 4.9 \text{ miles}$$

Number two:

- Similarly the distance covered by the different fires was established using the same type of methodology. To calculate the miles of travel by the seven different fires their distance was added together then divided by the total number of fires analyzed, that being seven.

$$\frac{(7+6+2+2.8+3.12+1.3+2.2+1.29)}{7} = 3.7 \text{ miles.}$$

After analyzing Rothermel's findings and the above calculations from actual fires, our conclusion is that in order to have a substantial effect on fire behavior, the area of vegetation manipulation has to be at least 3.7 to 4.9 miles. It would be reasonable to use a distance of up to **four miles** from nonfederal land.

The WUI, as defined here, is unbiased and consistent and—most importantly—it addresses all nonfederal and federal land that is adjacent nonfederal where potential wildfire spread on to nonfederal land exists, not just federally identified communities at risk. It is a planning tool showing where homes and businesses are located and the

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density of those structures leading to identification of where risk mitigation needs to take place.

The Healthy Forests Restoration Act makes a clear designation that the location of the WUI is at the determination of the county or reservation when a formal and adopted Community Wildfire Protection Plan is in place. It further states that the federal agencies are obligated to use this WUI designation for all Healthy Forests Restoration Act purposes. Park County evaluated a variety of different approaches to determining the WUI for the county and selected this approach and has adopted it for these purposes. In addition to a formal WUI map for use with the federal agencies, it is hoped that it will serve as a planning tool for the county, state and federal agencies, and local Fire Protection Districts. (See Park County Wildland-Urban Interface Map Appendix-Maps for page size map).

## Fire Weather and its Relation to Wildfires

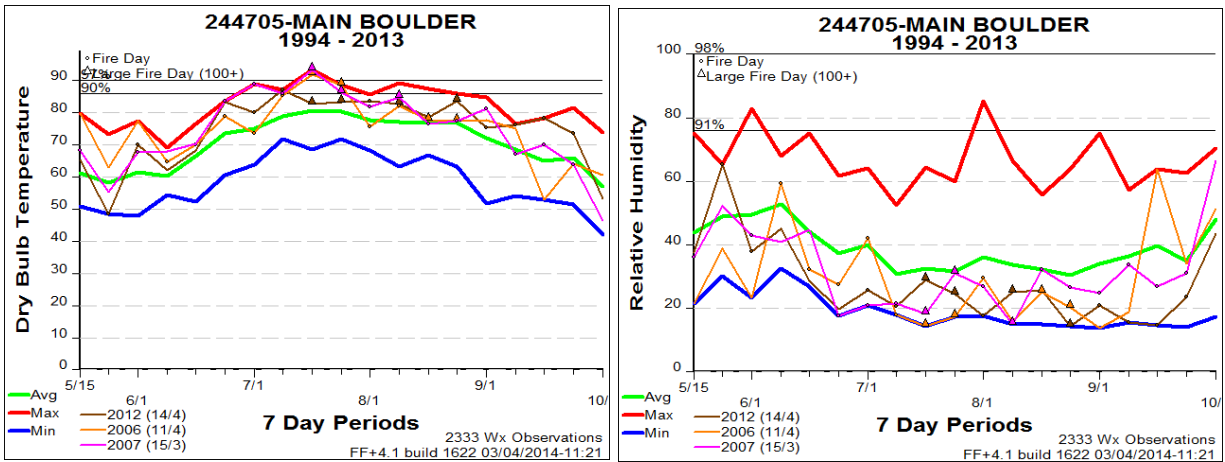
Weather directly affects fire behavior, with wind and low humidity values being the major influencing factors due to their ability to dry fuel and allow fires to grow rapidly. Generally, steering winds at the surface and aloft over Montana in the spring and summer prevail out of the south to west. Southwest and west facing slopes are more exposed to the prevailing winds and solar radiation and have drier fuel, which correlates to increased fire behavior activity. Wind-driven fires in Park County generally spread from west-southwest to east-northeast.

By using Fire Family Plus to correlate the temperature and relative humidity data for the last twenty years with when large fires have occurred, future large fire events can become more predictable. With this in mind, four weather stations have been identified that, together, form a composite snapshot of Park County's weather trends: Main Boulder #244705 located in the Boulder drainage at 4025 feet in elevation; Wicked Creek #244706 located on a ridge west of Wicked Creek on the south side of the Mill Creek drainage at 7604 elevation; White Sulphur Springs #243403 located in White Sulphur Springs at 5060 elevation; and Soda Butte #480119 located northwest of Cooke City at 8160 elevation. Main Boulder was chosen to have a station at low elevation while Wicked Creek represents the higher elevations. The White Sulphur Springs station was used due its location in relation to the northern part of Park County. The Soda Butte station is displayed because of its location in relation to Cooke City and Silvergate. With only three years of weather data for Soda Butte, the correlation of weather data to historic wildfire activity is limited. However, it will be the weather station to track into the future for Cooke City and Silvergate.

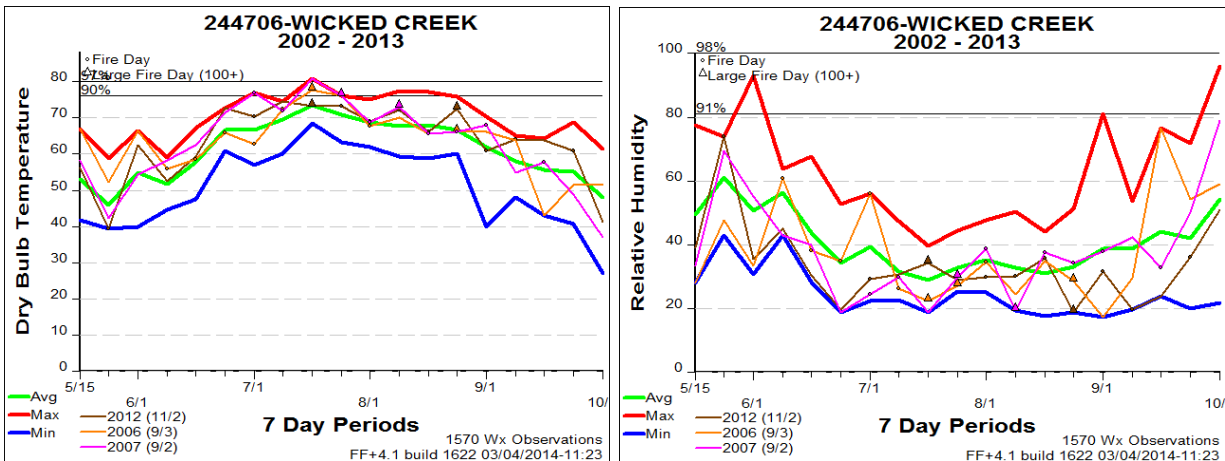
Additional the data for the years of 2006, 2007 and 2012 has been added to each graph to display wildfire activity during those years. "Fire days" are when fires occurred that year, and large fires are 100 acres or greater. Large fires of significance include the Big Creek Fire in 2006 (14,000 acres, start date 7-29-06), the Wicked Creek Fire in 2007 (26,000 acres, start date 8-9-07) and the Pine Creek Fire in 2012 (8612 acres, start date 8-29-12). You can track the day each of these fires started and what the

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temperature, relative humidity and Energy Release Component (ERC) was at the time.

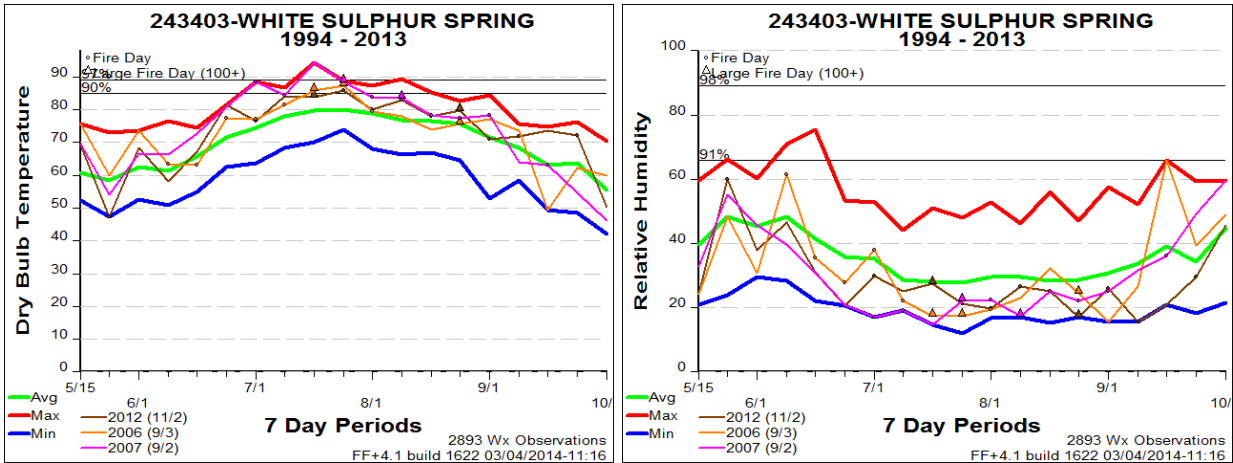


These graphs display the temperature and relative humidity for the Main Boulder weather station for the past 20 years. The yearly time frame displayed is from May 15<sup>th</sup> to Oct 1<sup>st</sup>. The maximum, minimum and averages are graphed in addition to the data for the years of 2006, 2007, and 2012. The triangles located along the graph lines for the years 2006, 2007 and 2012 indicate when there was a wildfire larger than 100 acres.

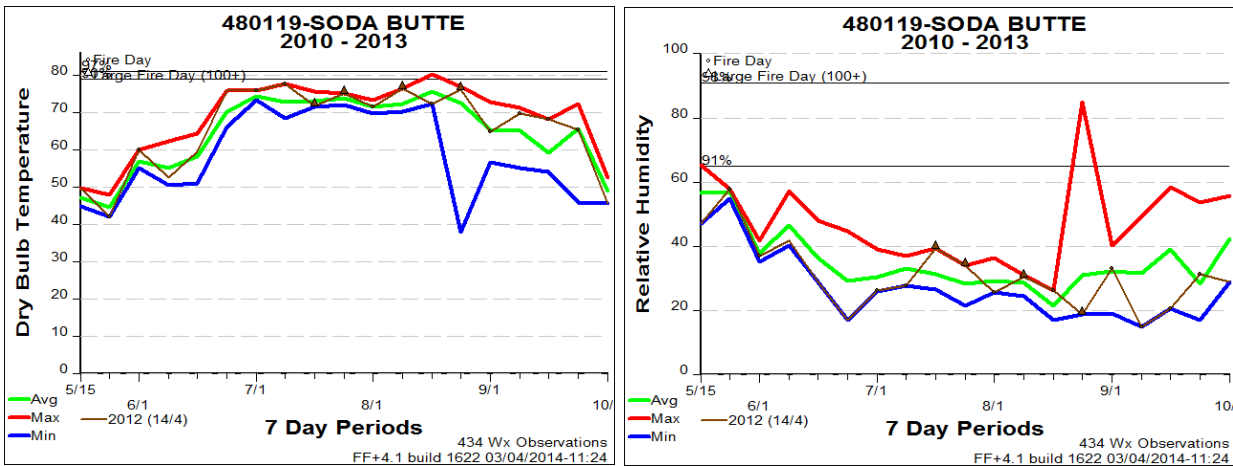


These graphs display the temperature and relative humidity for the Wicked Creek weather station for the past 10 years. The yearly time frame displayed is from May 15<sup>th</sup> to Oct 1<sup>st</sup>. The maximum, minimum and averages are graphed in addition to the data for the years of 2006, 2007, and 2012. The triangles located along the graph lines for the years 2006, 2007 and 2012 indicate when there was a wildfire larger than 100 acres.

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These graphs display the temperature and relative humidity for the White Sulphur Springs weather station for the past 20 years. The yearly time frame displayed is from May 15<sup>th</sup> to Oct 1<sup>st</sup>. The maximum, minimum and averages are graphed in addition the data for the years of 2006, 2007, and 2012. The triangles located along the graph lines for the years 2006, 2007 and 2012 indicate when there was a wildfire larger than 100 acres.



These graphs display the temperature and relative humidity for the Soda Butte weather station for the past 3 years. The yearly time frame displayed is from May 15<sup>th</sup> to Oct 1<sup>st</sup>. The maximum, minimum and averages are graphed in addition the data for the year of 2012(Pine Creek 8612 acres, start date 8-29-12). The triangles located along the graph lines for the year 2012 indicate when there was a wildfire larger than 100 acres.

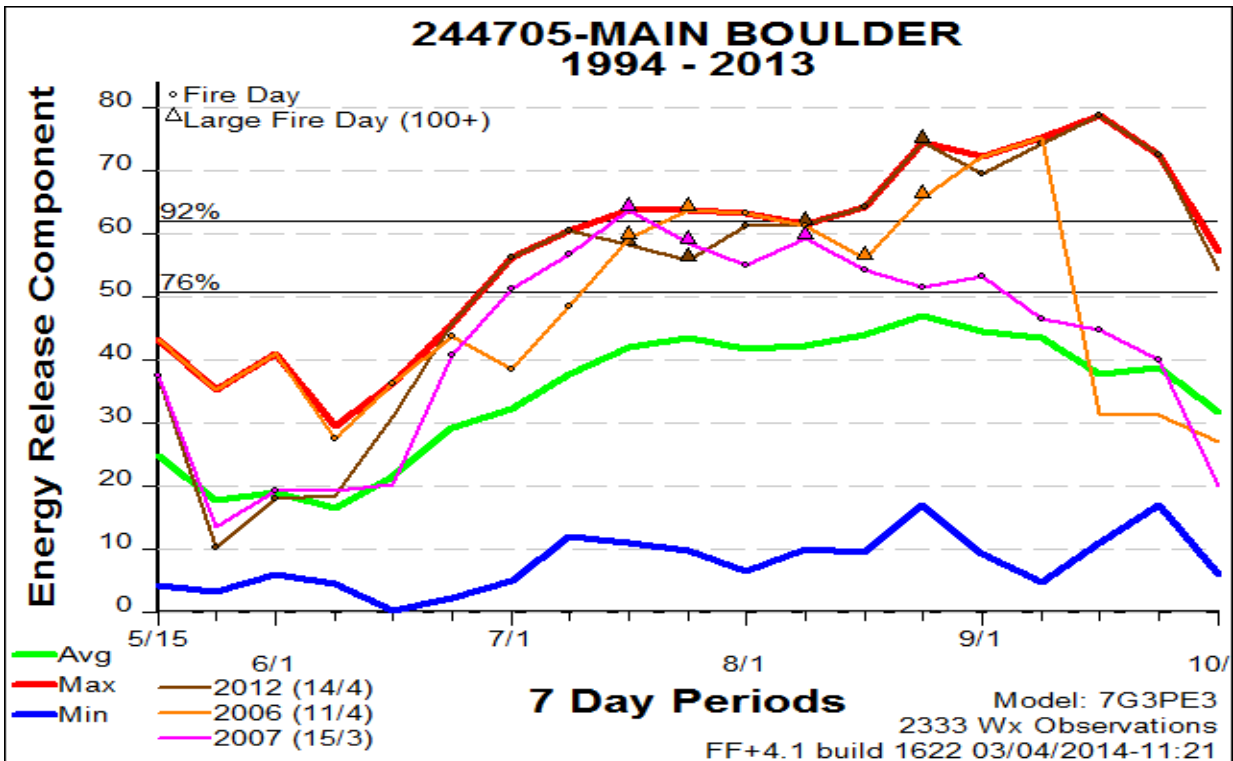
When correlated to wildfire activity, the weather data shows that most large fires happen when the temperature is closest to its highest and the relative humidity is at its closest to its lowest for that day.

In timbered areas, tracking the dryness of large dead and downed fuel in relation to weather data is helpful in predicting fire danger. The National Fire Danger Rating System (NFDRS) uses weather and fuel moisture data to do this. An output (index) of

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NFDRS is Energy Release Component (ERC), which is a good way to track seasonal wildfire danger. The Energy Release Component (ERC) index is related to how hot a fire could burn. It is directly related to the 24-hour, potential worst case, total available energy (BTUs) per unit area (in square feet) within the flaming front at the head of a fire.

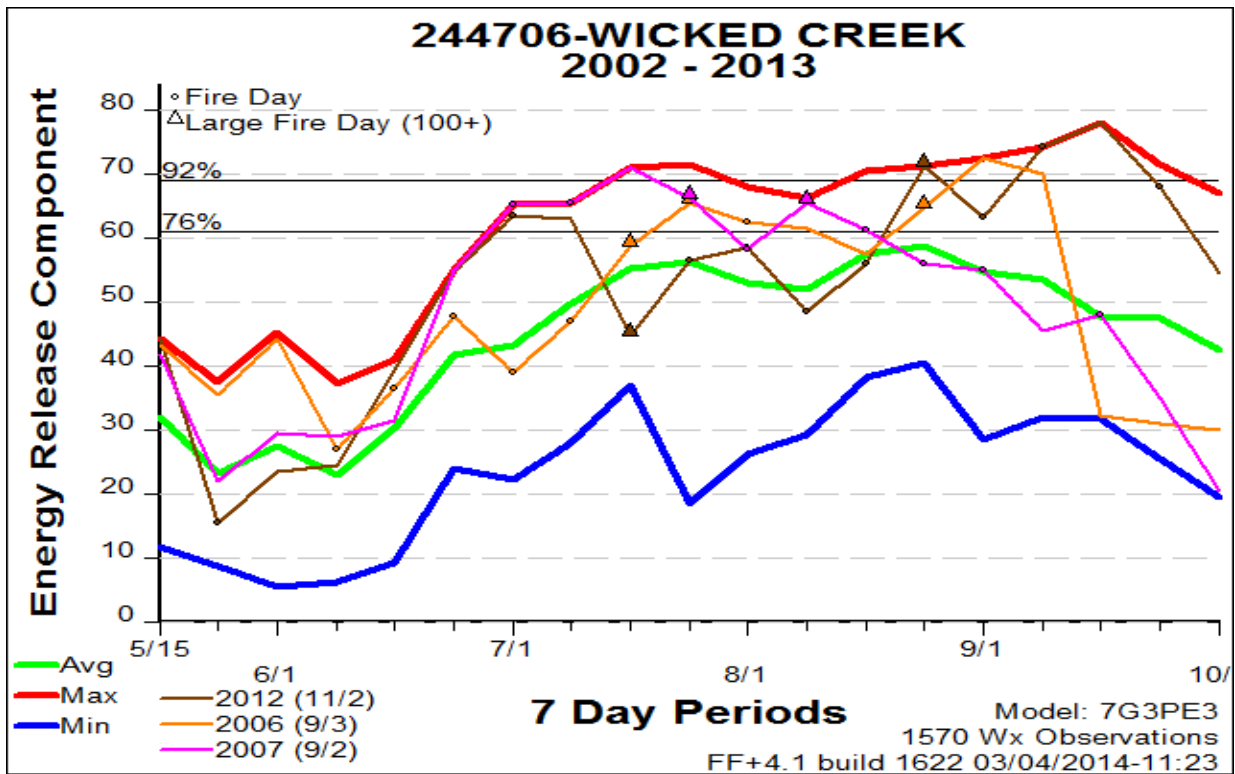
The ERC can serve as a good characterization of fire season as it tracks seasonal fire danger trends well. The ERC is a function of the fuel model and live and dead fuel moistures. Fuel loading, woody fuel moistures, and larger fuel moistures all have an influence on the ERC, while the lighter fuel have less influence and wind speed has none. ERC has low variability, and is the best fire danger component for indicating the effects of intermediate to long-term drying on fire behavior (if it is a significant factor) although it is not intended for use as a drought index.



This graph displays the NFDRS Energy Release Component for the Main Boulder weather station for the past 20 years. The yearly time frame displayed is from May 15<sup>th</sup> to Oct 1<sup>st</sup>. The maximum, minimum and averages are graphed in addition the data for the years of 2006 (Big Creek Fire 14,000 acres, start date 7-29-06), 2007 (Wicked Creek 26,000 acres, start date 8-9-07) and 2012(Pine Creek 8612 acres, start date 8-29-12). The triangles located along the graph lines for the years 2006, 2007 and 2012 indicate when there was a wildfire larger than 100 acres.

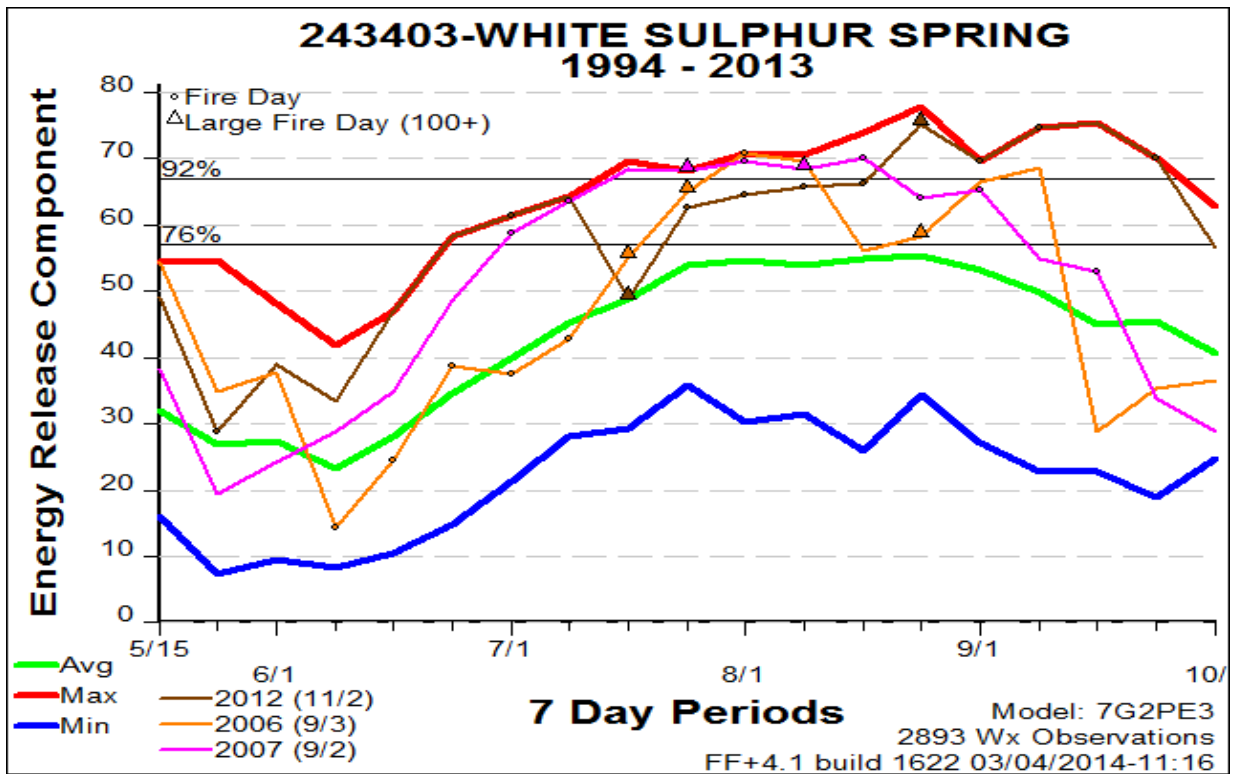


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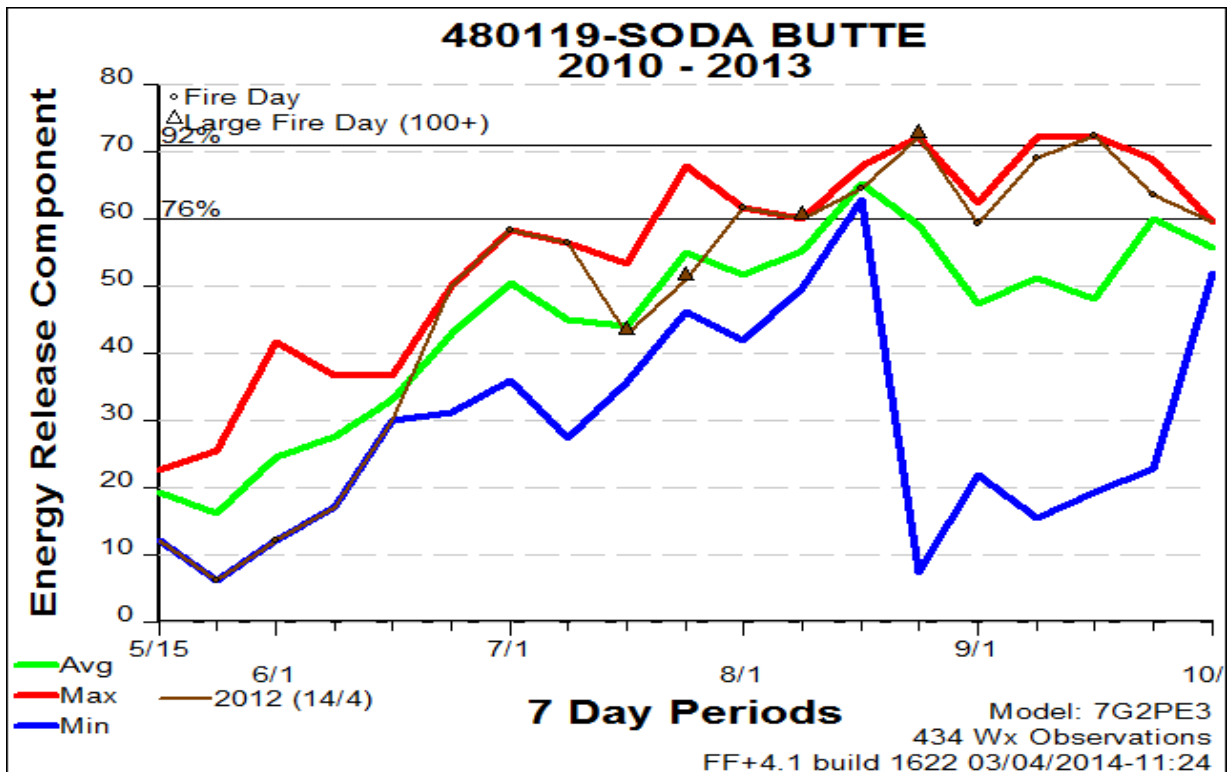
This graph displays the NFDERS Energy Release Component for the Wicked Creek weather station for the past 10 years. The yearly time frame displayed is from May 15<sup>th</sup> to Oct 1<sup>st</sup>. The maximum, minimum and averages are graphed in addition the data for the years of 2006 (Big Creek Fire 14,000 acres, start date 7-29-06), 2007 (Wicked Creek 26,000 acres, start date 8-9-07) and 2012(Pine Creek 8612 acres, start date 8-29-12). The triangles located along the graph lines for the years 2006, 2007 and 2012 indicate when there was a wildfire larger than 100 acres.

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This graph displays the NFDRS Energy Release Component for the White Sulphur Springs weather station for the past 20 years. The yearly time frame displayed is from May 15<sup>th</sup> to Oct 1<sup>st</sup>. The maximum, minimum and averages are graphed in addition the data for the years of 2006 (Big Creek Fire 14,000 acres, start date 7-29-06), 2007 (Wicked Creek 26,000 acres, start date 8-9-07) and 2012(Pine Creek 8612 acres, start date 8-29-12). The triangles located along the graph lines for the years 2006, 2007 and 2012 indicate when there was a wildfire larger than 100 acres.

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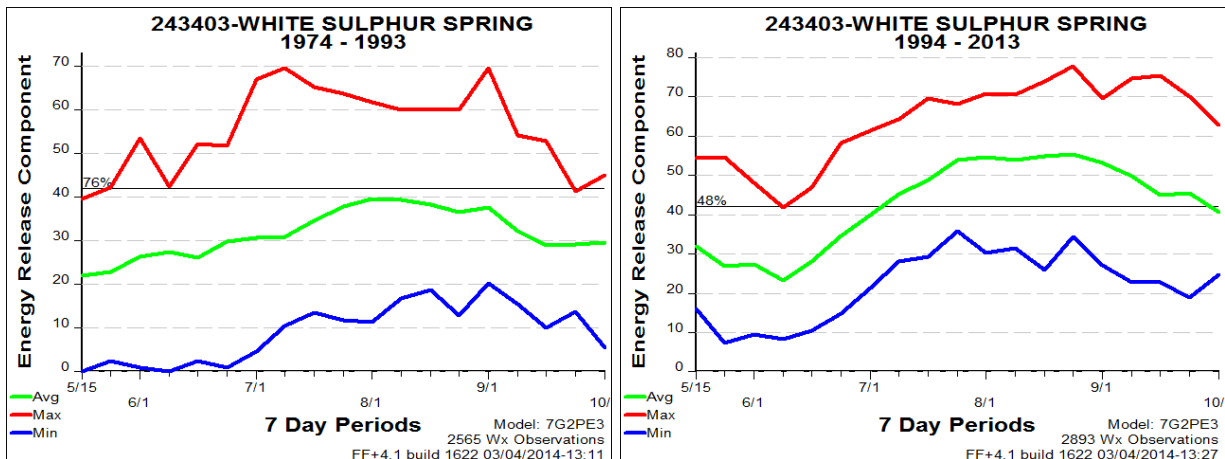


This graph displays the NFDRS Energy Release Component for the Soda Butte weather station for the past 3 years. The yearly time frame displayed is from May 15<sup>th</sup> to Oct 1<sup>st</sup>. The maximum, minimum and averages are graphed in addition the data for the year of 2012(Pine Creek 8612 acres, start date 8-29-12). The triangles located along the graph lines for the year 2012 indicate when there was a wildfire larger than 100 acres.

The NFDRS Energy Release Component ERC when correlated to wildfire activity shows that most large fires happen when the ERC is high if not the highest for that date. Looking at the ERC for 2012 in correlation to the maximum for the Main Boulder and White Sulphur Springs stations it was at the maximum for an extended part of the fire season that year.

Looking at weather data for the past 40 years, the average temperature has increased slightly and the average relative humidity has decreased slightly. This has caused an increase in the ERC indices of the past 20 years in comparison to the 20 years prior.

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These graphs display the NFDERS Energy Release Component for the White Sulphur Springs stations from 1974 to 1993 and 1994 to 2013. The ERC has increased significantly in the past 20 years when compared to the 20 years prior.

Conclusion: With the general trend toward hotter and dryer weather, and with a corresponding increase in the ERC index, large wildfire activity will continue to occur and increase in the future. Tracking the weather and NFDERS indexes is and will be important when predicting if and when large fires will occur.

Links to the weather stations and NFDERS data:

Main Boulder # 244705 weather station

<http://www.wrh.noaa.gov/mesowest/getobext.php?wfo=mso&sid=MBRM8&num=48&raw=0&dbn=m>

Wicked Creek #244706 weather station

<http://www.wrh.noaa.gov/mesowest/getobext.php?wfo=mso&sid=WCRM8&num=48&raw=0&dbn=m>

White Sulphur Springs #243403 weather station

<http://www.wrh.noaa.gov/mesowest/getobext.php?wfo=mso&sid=WSRM8&num=48&raw=0&dbn=m>

Soda Butte #480119 weather station

<http://www.wrh.noaa.gov/mesowest/getobext.php?wfo=mso&sid=SBYM8&num=48&raw=0&dbn=m>

White Sulphur Springs ERC Chart

<http://gacc.nifc.gov/nrcc/dc/mtgdc/DOCS/Graphs/243403.jpg>

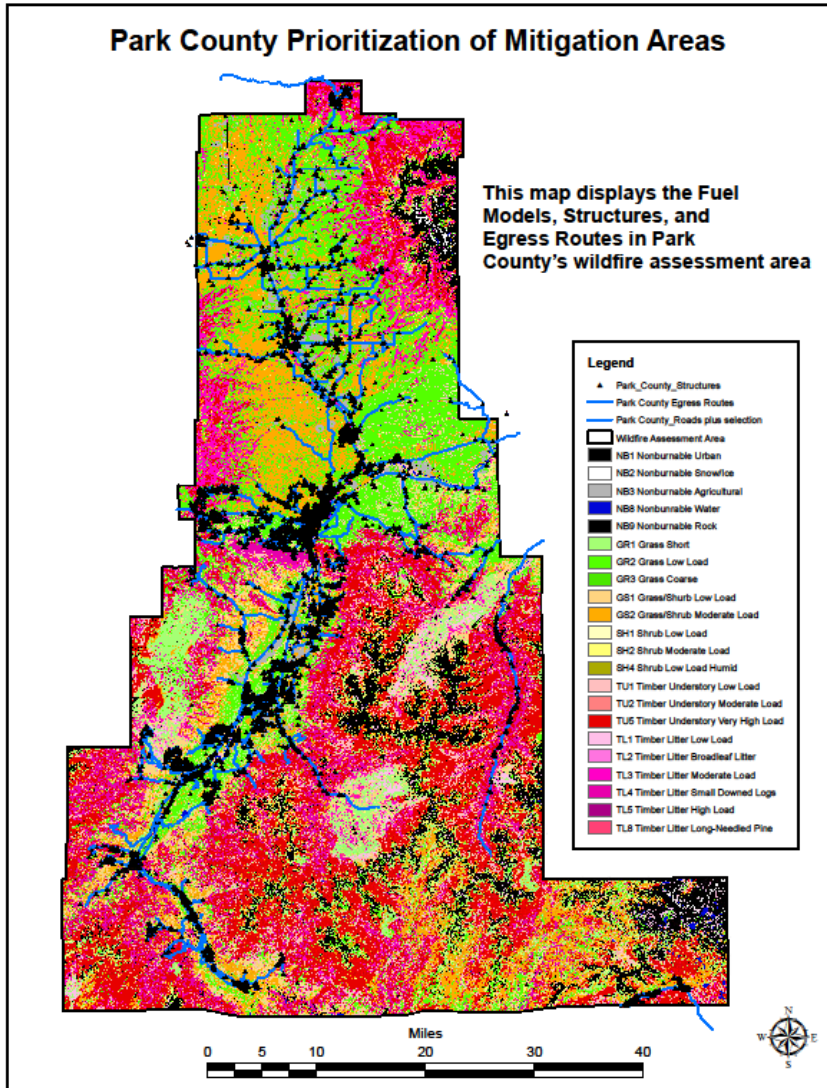
Daily NFDERS index's for Montana can be obtained from

[http://gacc.nifc.gov/sacc/predictive/fuel\\_fire\\_danger/FD/Montana.txt](http://gacc.nifc.gov/sacc/predictive/fuel_fire_danger/FD/Montana.txt)

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## Prioritization of hazardous fuel mitigation areas

Fire history, fuel models, fire regime and condition classes, values at risk, egress roads, and WUI are used in conjunction with each other to determine where hazardous fuel mitigation projects need to take place. The first data to look at are values at risk and egress roads, and their location within or adjacent to fuel models of concern. The Park



County Prioritization of Mitigation Areas map displays this data. The next step is to look at the Park County Wildfire History 1986 – 2013 map to see if there have been ignitions or large fires in the area.

Areas that are in fire regime 1 or 2 of a 0-35 year fire frequency and are in fire regime condition class 2 or 3 with a moderate to high departure from the natural (historical) regime of vegetation may also be areas to look at.

This data focuses the mitigation efforts in some general areas. The specific hazardous fuel mitigation treatments and placement of these treatments within an area requires site-specific knowledge. The

county fire warden and fire planner have worked with the fire chiefs of Park County to identify specific projects and areas. These areas and projects are prioritized in the Hazardous Fuel Mitigation Projects section.

(See Park County Prioritization of Mitigation Areas map Appendix-Maps for page size map)

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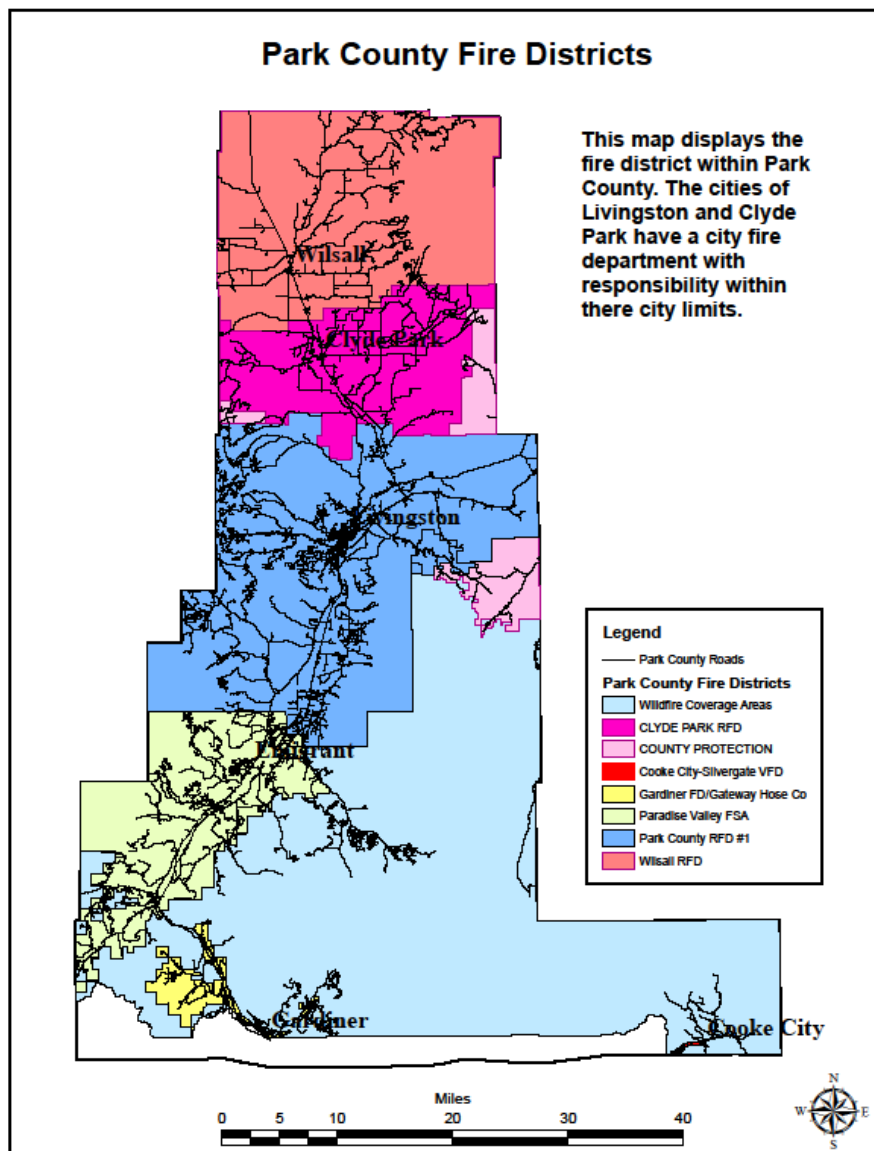
## Hazardous Fuel Mitigation Projects

This section of the Park County CWPP identifies by fire district / fee service area hazardous fuel mitigation projects that can/should be implemented in the next five years.

Park County is located in a fire-prone ecosystem. While the occurrence of wildfire is inevitable, hazardous fuel mitigation treatments can reduce a fire's spreading capability, decrease its intensity, and reduce its spotting capability. The ultimate goal of any fuel treatment is to have every value at risk in such a state that when it is eventually subjected to wildfire, the results will be acceptable. By working with partners

(BLM, DNRC, USFS and private landowners) to identify, coordinate and implement fuel reduction projects, Park County can significantly reduce the harmful effects of a wildfire on values at risk.

Hazardous fuel mitigation projects for each fire district/fee service area and a list of projects within the district in order of priority were identified. These projects are in the identification of need, planning or implementation stage. For these projects to be effective in reducing the fire hazard, they all need to enter the implementation (or, preferably, completion) phase



# Park County Community Wildfire Protection Plan 2014

within the next five years. The agencies responsible for them will need to focus on giving them a greater priority if they are to achieve maximum effectiveness.

Fuel treatments will be of one of the three project types: structure defensible space, roadside fuel treatments, and fuel reduction. Specific projects may include areas of more than one project type.

Structure Defensible Space Projects: Treatments will be site specific, but will likely include homeowner education, structure triage, creation of a wildfire-defensible space around structures, and access corridor improvements. Specific site conditions may call for other types of fuel reduction and fire mitigation techniques as well. The estimated project cost was calculated by assuming an average treatment cost of \$400 per structure in rangeland/agricultural areas and \$1,000 - 4000 per structure in forested areas.

Roadside Fuel Treatment Projects: Treatment projects are access corridors identified by the county as being potentially unsafe for both ingress by emergency responders and egress in the event of an emergency evacuation due to wildfire. Treatments within the project areas will be site specific, but will likely include precommercial or commercial thinning within 200 feet of each side of the road, herbicide applications, and brush removal with the intent to create a fuel break along the road corridor. Prescriptions may include more intense removal of trees and other vegetation within 5 to 100 feet of the road and reduced intensity removal farther out. This technique will help lessen the intensity of a wildfire and may bring a crown fire to the ground before it reaches the road. Specific site conditions may call for other types of fuel reduction and fire mitigation techniques as well. The estimated project cost was calculated by assuming an average treatment cost of \$700 - 1200 per acre of treatment.

The planning and implementation of the identified roadside fuel projects does not alter, diminish, or expand the existing jurisdiction, statutory and regulatory responsibilities and authorities or budget processes of federal state, and tribal agencies. All planning in relation to wildfire mitigation must be taken in light of the existing regulatory and environmental laws. This will be determined by the owner of the parcel implementing the treatment. Thus, if proposed activities are to occur on federal lands, then the National Environmental Policy Act (NEPA) will determine environmental protection measures.

Fuel Reduction Projects: Projects have been identified to treat specific areas at high risk to wildfire due not only to the forest fuel, but also due to increased likelihood of an ignition. High use recreational areas or industrial operations in or near forestland fuel have an increased likelihood of an ignition from human or mechanical sources. The proposed fuel reduction projects will likely include more general fuel treatments such as forest health improvements in the surrounding area in conjunction with enhanced fire safety precautions. Installation of escape resistant fire pits, barbeque stands, designated trails, and restricted use of fireworks can help reduce the ignition risk in recreational areas, while having fire extinguishers on site and creating a maintained fuel break between mechanical operations and forestlands can

## Park County Community Wildfire Protection Plan 2014

decrease the ignition risk in industrialized areas. The estimated project cost was based on \$250 - 1000 per acre of treatment. Cost estimates assume that no revenue was generated by the removal of timber or other product.

Park County, U.S. Forest Service, Bureau of Land Management, and/or the Montana Resource Conservation and Development (RC&D) may take the lead on implementation of many of these projects; however, project boundaries were purposely drawn without regard to land ownership in order to capture the full breadth of the potential wildfire risk. Coordination and participation by numerous landowners may be required for the successful implementation of the identified projects.

Maps and descriptions of the projects, along with a discussion of project intent for each will be included. This section is the first step in the project planning process. A number of additional steps are required before any project can be implemented.

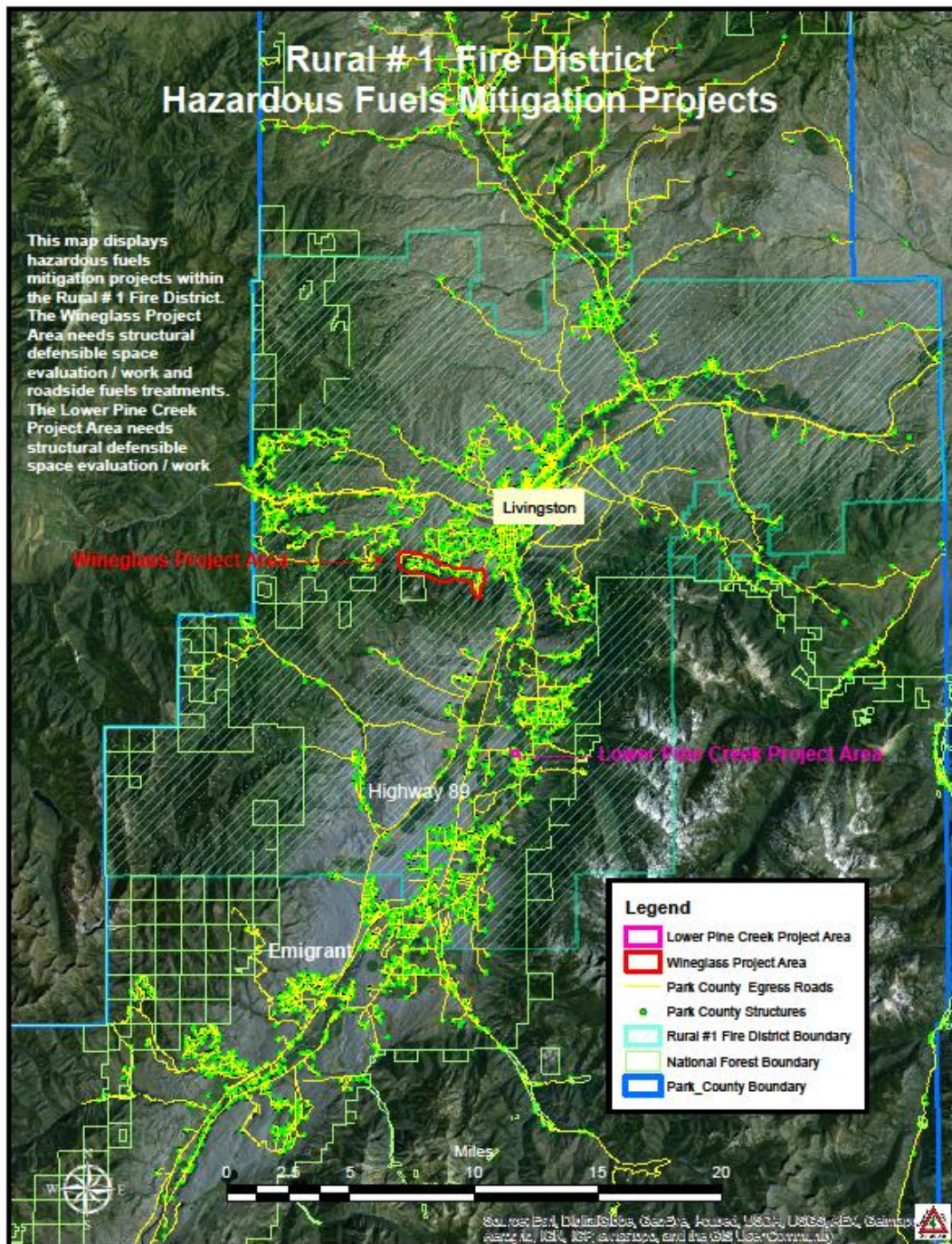


# Park County Community Wildfire Protection Plan 2014

## Rural #1 Fire District

Rural #1 Fire District hazardous fuel mitigation projects are located in the Wineglass and Lower Pine Creek areas. Residences in the area need structural defensible space evaluation and work. The road needs roadside fuel treatments to allow safe travel

during a wildfire event.

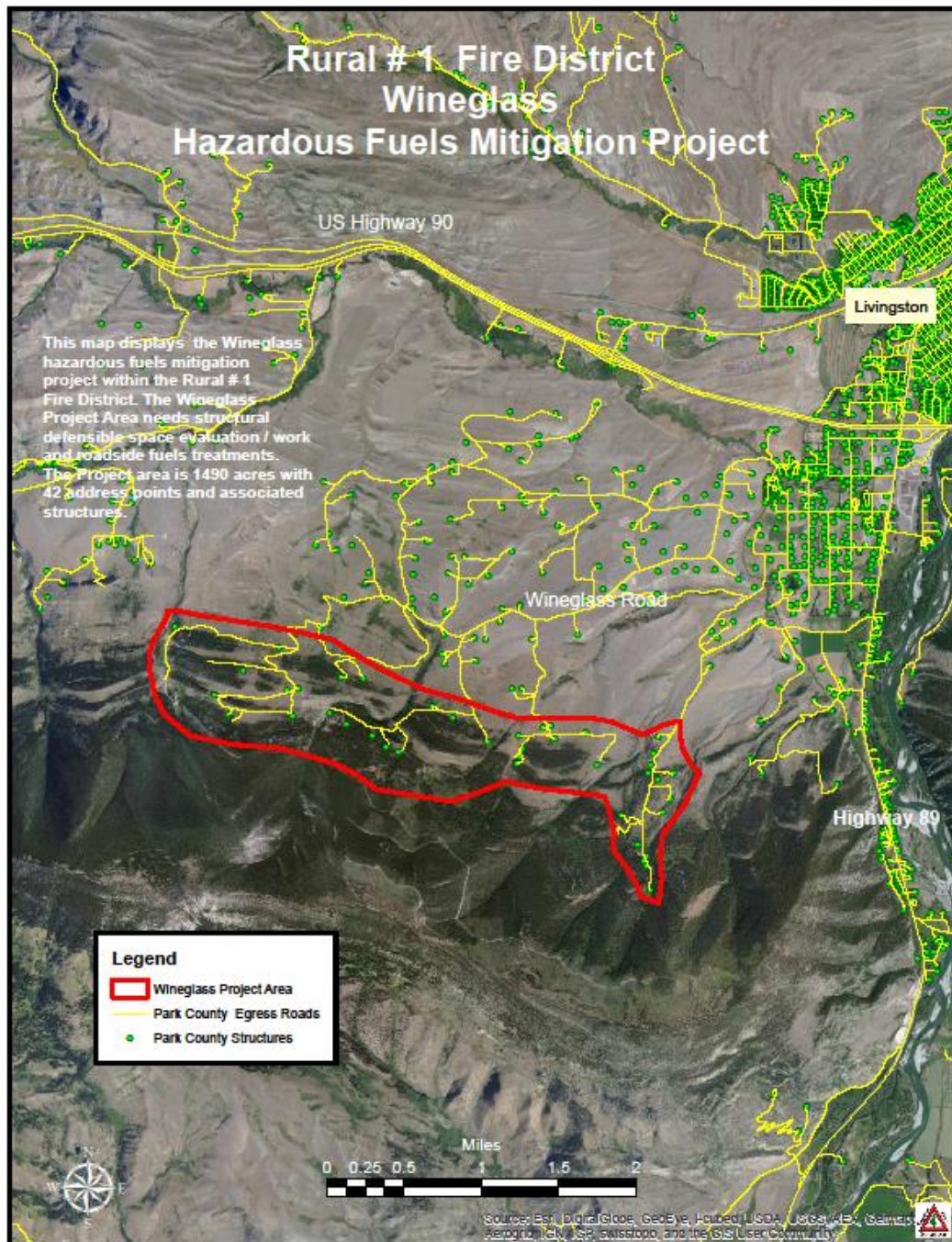


# Park County Community Wildfire Protection Plan 2014

## Wineglass Project Area

The Wineglass Project area is located southwest of Livingston in the Wineglass Road and Hideway Trail area. The project area is 1490 acres with 42 address points within

the area. Each address point has at least one structure with most having two or more

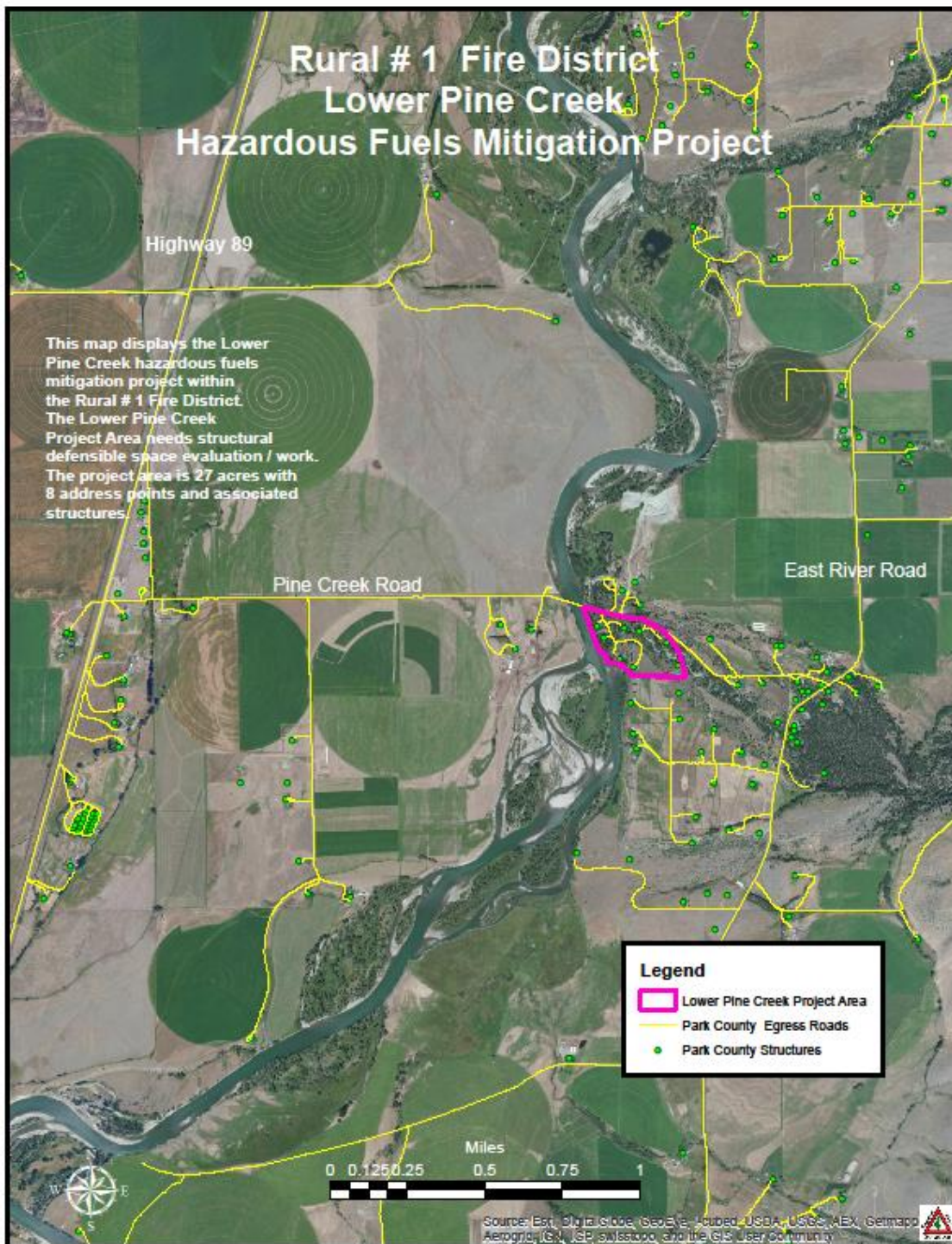


structures. These structures need structural defensible space evaluation and work. The egress roads needs roadside fuel treatments to allow safe travel during a wildfire event.

# Park County Community Wildfire Protection Plan 2014

## Lower Pine Creek Project Area

The Lower Pine Creek Project area is located adjacent to the Pine Creek road between the Yellowstone River and The East River Road. The project area is 27 acres with 8 address points within the area. These structures need structural defensible space evaluation and work. The egress roads needs roadside fuel treatments to allow safe travel during a wildfire event.

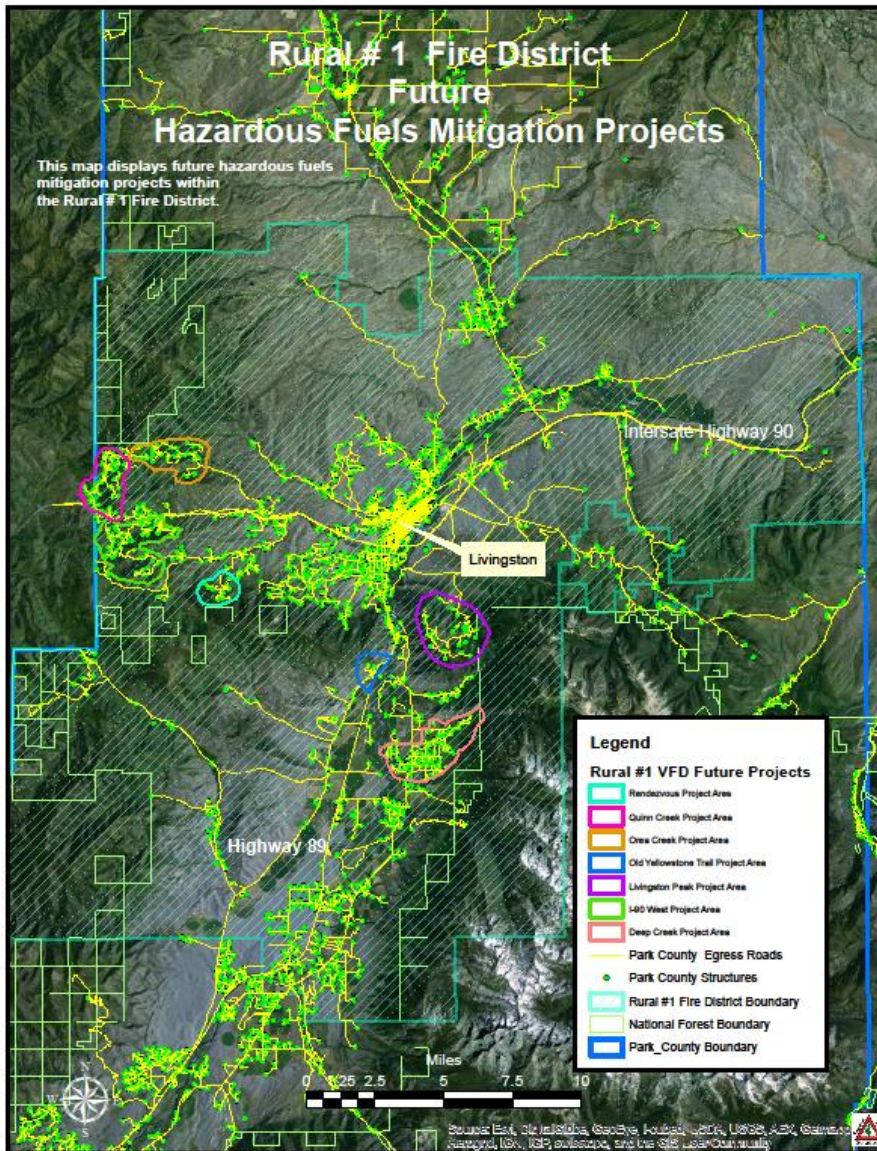


# Park County Community Wildfire Protection Plan 2014

## Rural #1 Fire District Future Hazardous Fuel Mitigation Projects

Future hazardous fuel mitigation projects within the Rural #1 Fire District area are needed to further reduce the effects of wildfire. The structures within each project area

need structural defensible space evaluation and work. The egress roads needs roadside fuel treatments to allow safe travel during a wildfire event.



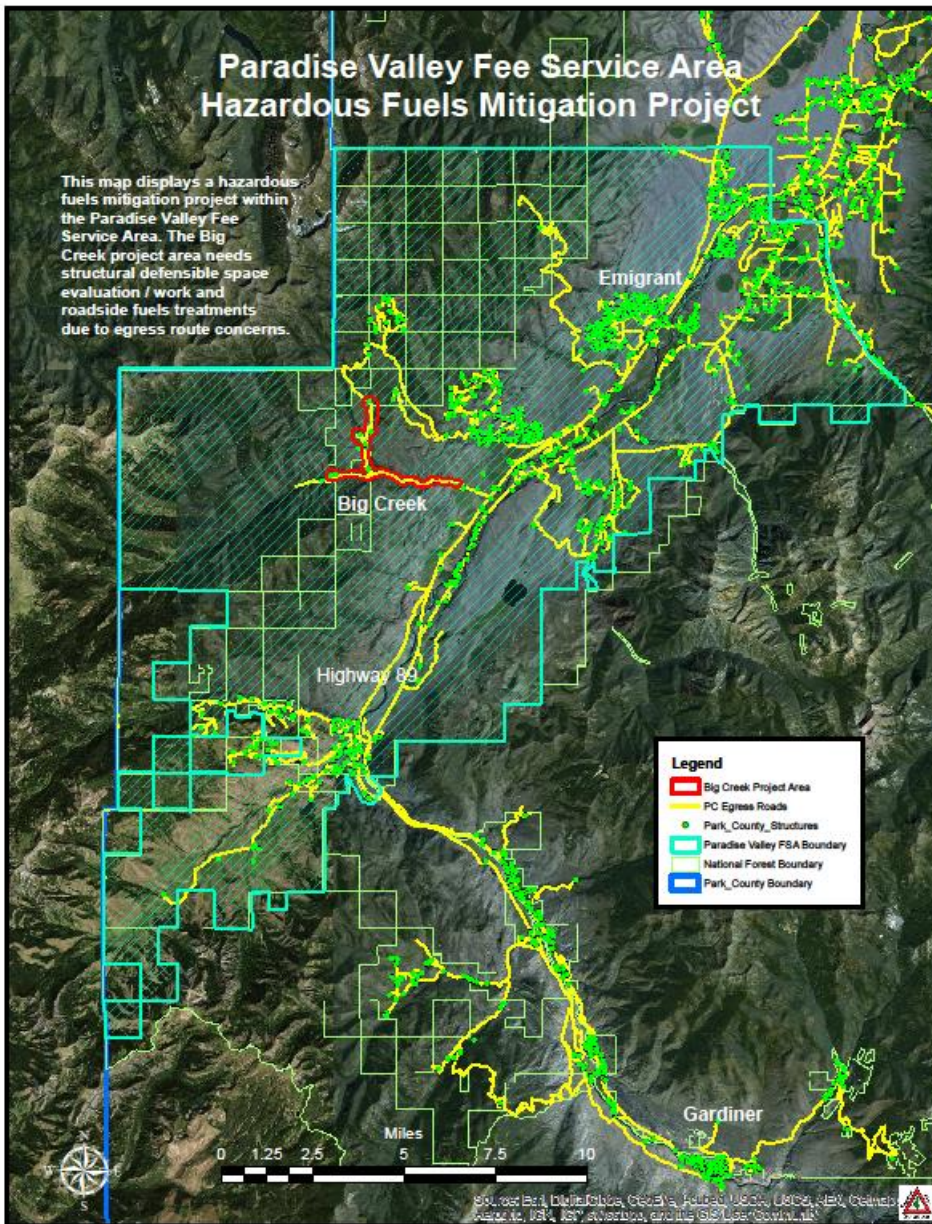
Project Name	Priority	Acres	Address Points
Orea Creek	1	1715	33
Deep Creek	2	3705	117
I-90	3	2371	61
Quinn Creek	4	1983	62
Rendezvous	5	895	9
Livingston Peak	6	3183	24
Old Yellowstone Trail	7	552	3

# Park County Community Wildfire Protection Plan 2014

## Paradise Valley Fee Service Area

Paradise Valley Fee Service Area hazardous fuel mitigation project is located in the Big Creek and Hyalite Creek drainages. The Big Creek project is a structural defensible space and roadside fuel treatment project. The structures of the Mountain Sky Guest Ranch and other private structures within these two drainages need to be evaluated for structural defensible space work and work needs to be completed. The Big Creek and Hyalite Creek roads needs roadside fuel treatments to allow safe travel during egress from a wildfire event.

from a wildfire event.

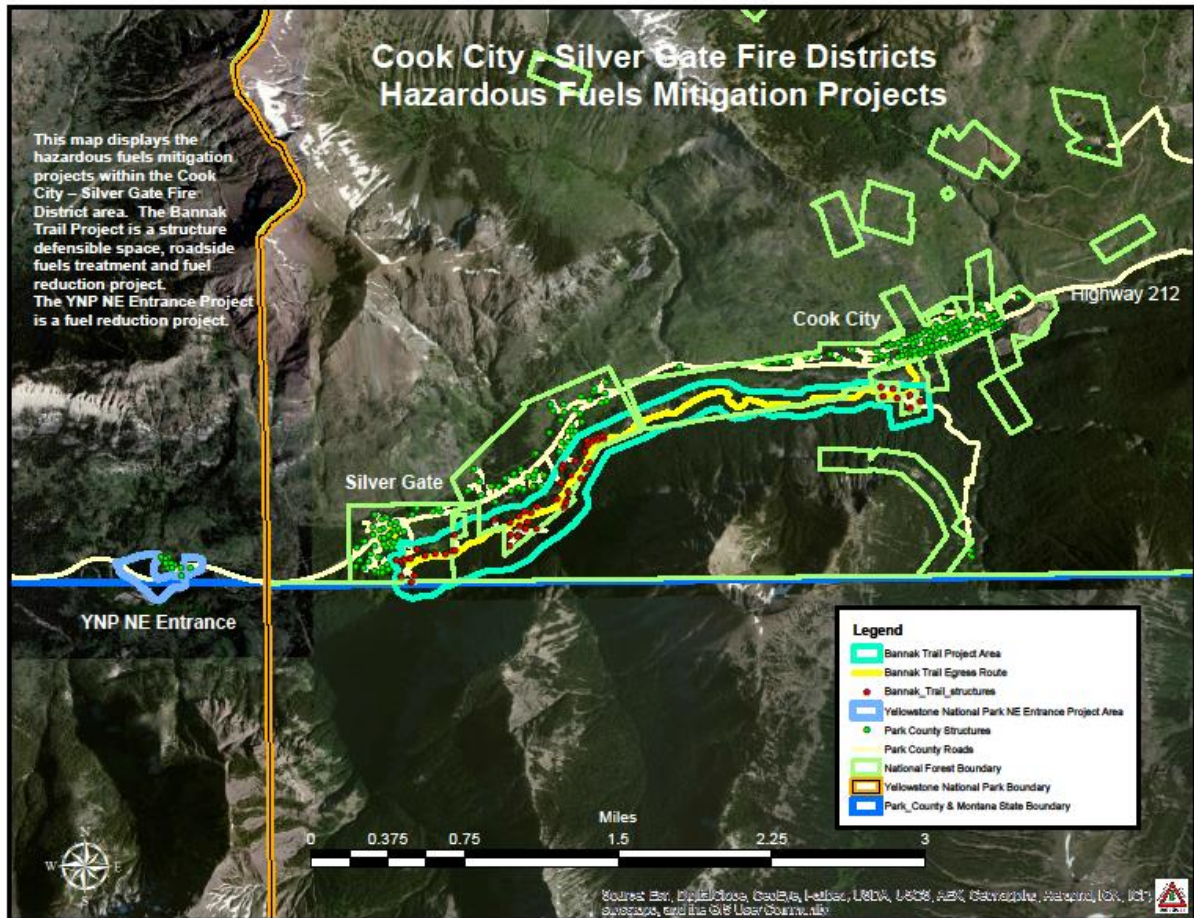


# Park County Community Wildfire Protection Plan 2014

## Cook City – Silver Gate Fire District

Cook City – Silver Gate Fire District hazardous fuel mitigation projects are located along the Bannak Trail road, and at the Yellowstone National Park NE entrance.

The Bannak Trail Project is located adjacent to the Bannak Trail Road which is the egress route for the residences located along the road. If the Bannak Trail road is



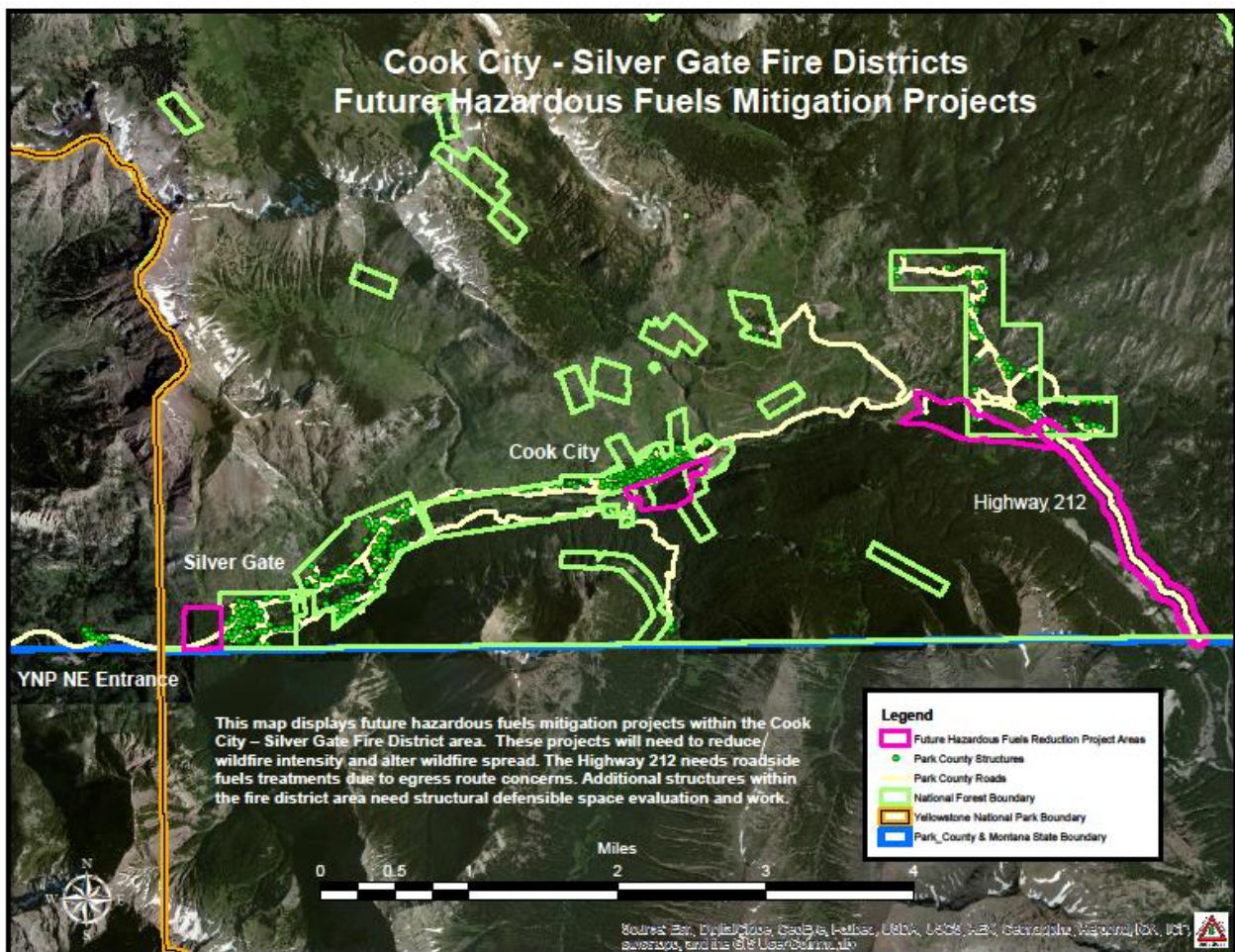
compromised at either end. Residences need a safe route to evacuate. Residences in the area need structural defensible space evaluation and work. The road needs roadside fuel treatments to allow safe travel during a wildfire event. The road bed needs to be kept in a condition to allow safe travel. The road bed needs structural work at the east end. Fuel reduction work needs to be done within the project area to reduce wildfire intensity and alter wildfire spread. There has been defensible space work done within the project area, financed through the RC&D fuel mitigation program.

The Yellowstone NE Entrance Project is located adjacent to the Park Service buildings at the Northeast Entrance. The structures have already had some defensible space work completed around them. The project is a fuel reduction treatments to reduce wildfire intensity and alter fire behavior before a wildfire impinges on the structures

# Park County Community Wildfire Protection Plan 2014

## Cook City – Silver Gate Fire District Future Hazardous Fuel Mitigation Projects

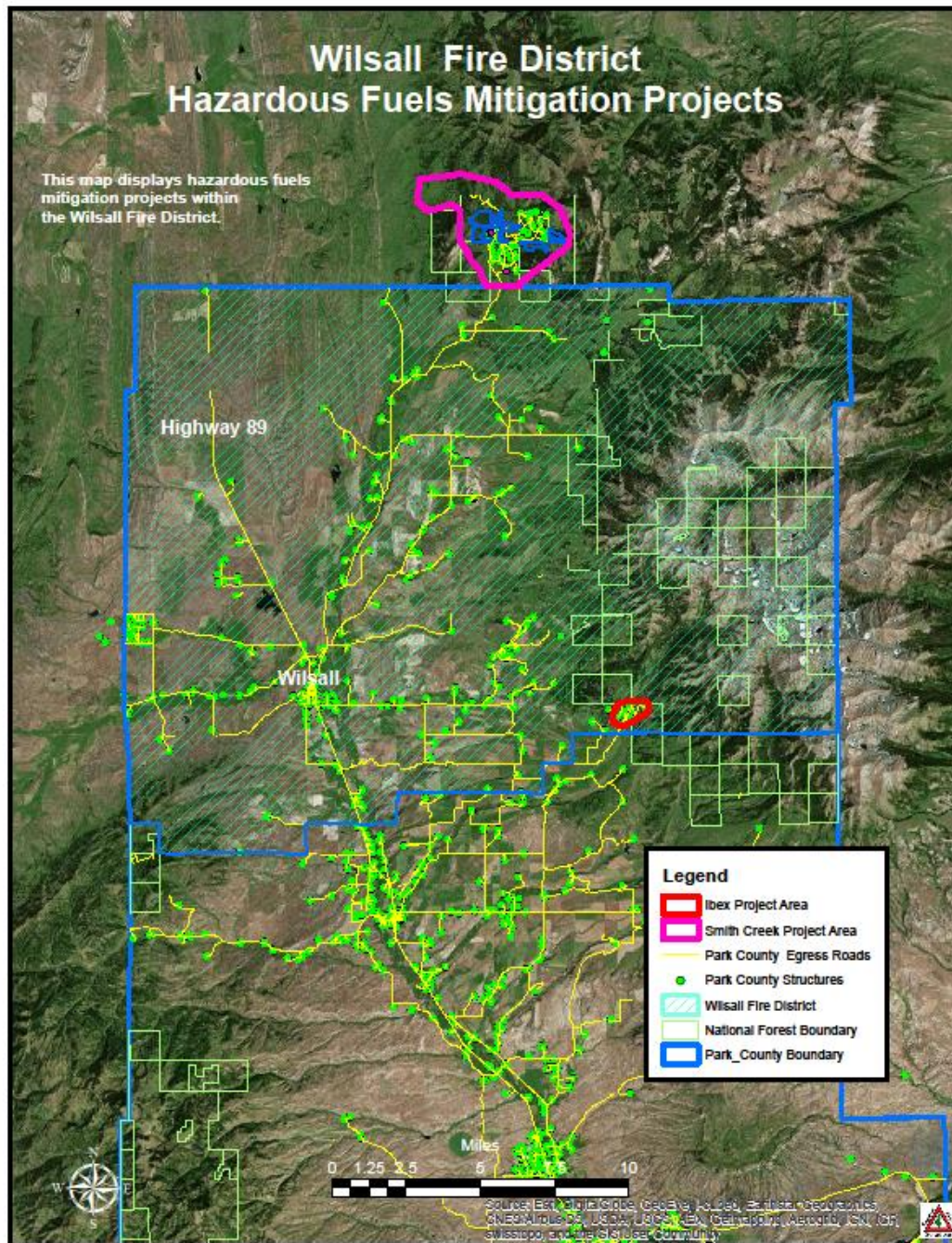
Future hazardous fuel mitigation projects within the Cook City – Silver Gate Fire District area are needed to further reduce the effects of wildfire. These projects will need to reduce wildfire intensity and alter wildfire spread adjacent to and up wind of areas of structures and other values at risk. The Highway 212 needs roadside fuel treatments due to egress route concerns. Additional structures within the fire district area need structural defensible space evaluation and work. Hazardous fuel mitigation treatments need maintenance in the future. Structural defensible space projects need maintenance yearly.



# Park County Community Wildfire Protection Plan 2014

## Wilsall Fire District

The Wilsall Fire District hazardous fuel mitigation projects are located in the Smith Creek and Ibox areas. Residences in the area need structural defensible space evaluation and work. The road needs roadside fuel treatments to allow safe travel during a wildfire event.





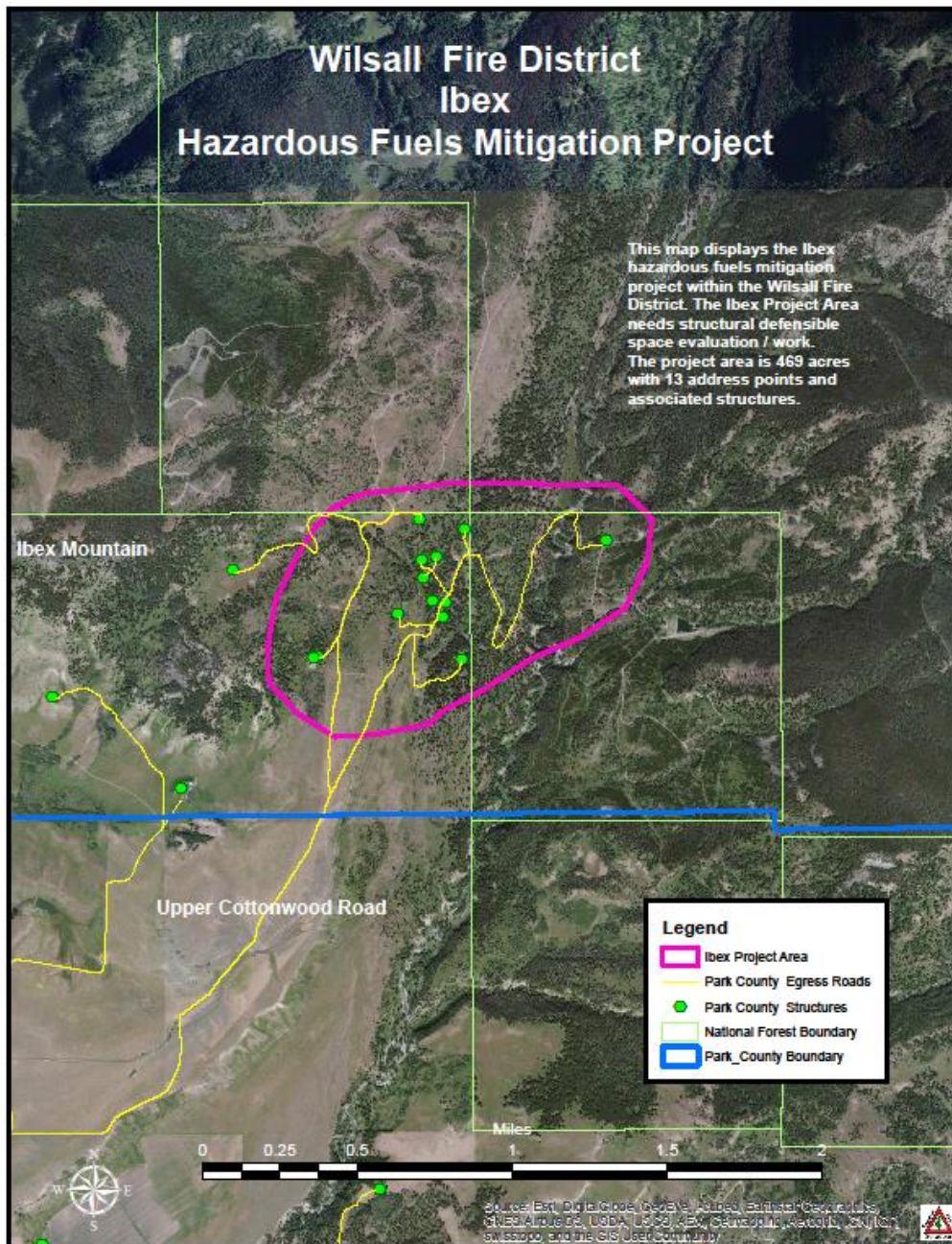


# Park County Community Wildfire Protection Plan 2014

## Ibex Project Area

The Ibex Project area is located in Cottonwood Creek drainage, east of Ibex Mountain.

Residences in the area need structural defensible space evaluation and work. The road needs roadside fuel treatments to allow safe travel during a wildfire event.

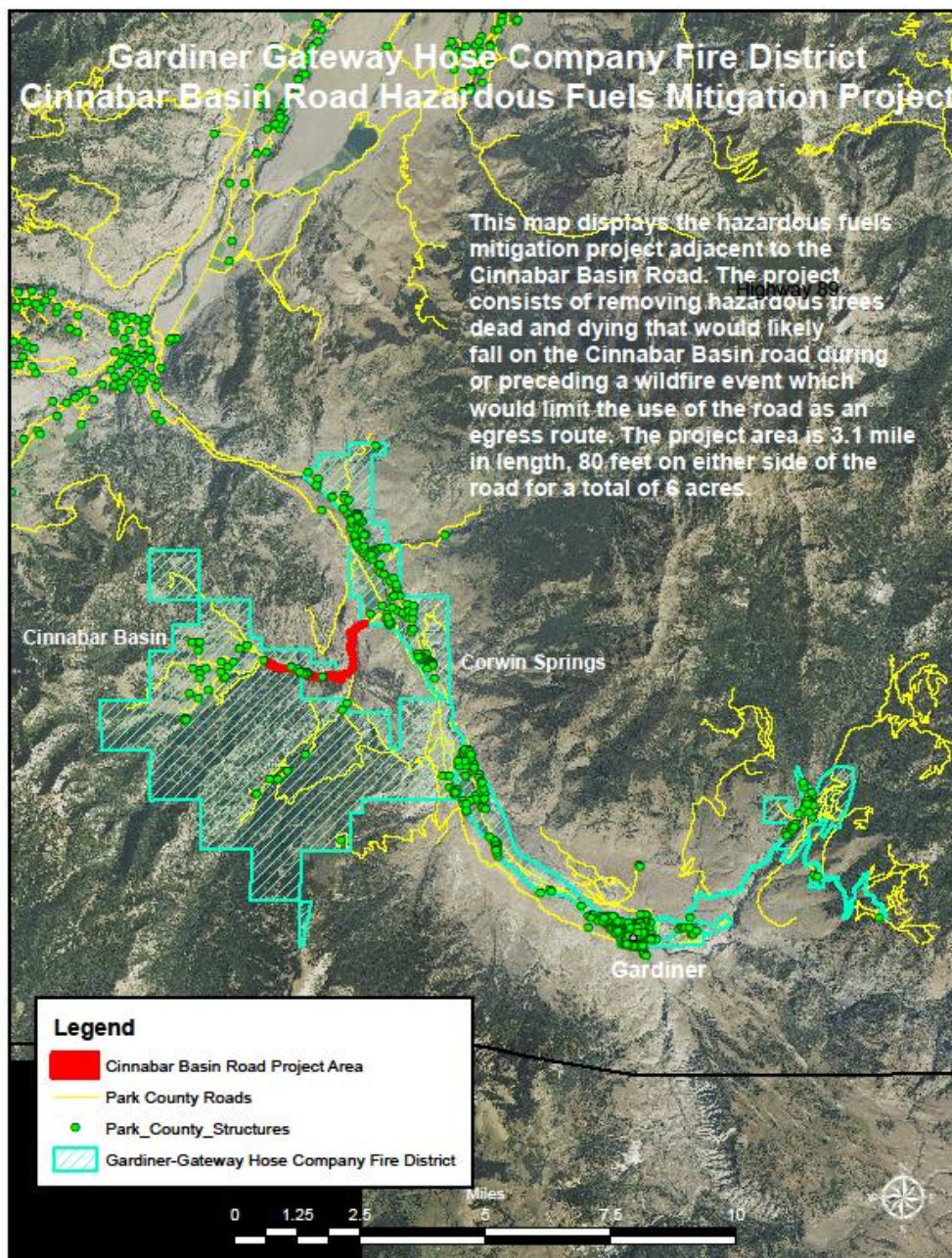


# Park County Community Wildfire Protection Plan 2014

## Gardiner-Gateway Hose Company Fire District

Gardiner-Gateway Hose Company Fire District hazardous fuel mitigation project is a roadside fuel treatment project along the Cinnabar Basin road. This road is the egress route for the residences in the Cinnabar Basin, along Cinnabar Creek and in the Mol Heron Creek drainage. The project consists of the identification and removing

hazardous dead and dying trees that would likely fall on the Cinnabar Basin road during or preceding a wildfire event which would limit the use of the road as an egress route. The project area is 3.1 mile in length, 80 feet on either side of the road for a total of 6 acres. The Cinnabar basin road is a county road. Most of the project would be within the county road right of way.



# Park County Community Wildfire Protection Plan 2014

## Reducing Structural Ignitability and Strengthening Homeowner Fire Preparedness

This section provides strategies to help identify and implement approaches to reduce structural ignitability. An approach to reduce structural ignitability and overall community vulnerability depends on citizens to engage in fuel reduction efforts around the home and reduce the ignitability of the components of the home.

### Public Preparedness and Education

Public education and outreach to residents about how homes ignite and how to reduce ignition potential is the first step toward enabling property owners to modify their homes and surrounding landscapes most effectively. During extreme wildland–urban fires, homes ignite in two principal ways: 1) directly from flame heating, and 2) from direct firebrand ignition (burning ember spot ignitions). If a homeowner modifies both the structure itself and its immediate surroundings, the home is much less likely to ignite during a wildfire, and thus has a much greater chance of surviving a wildfire.

Public education can be furthered with the use of the “Ready Set Go Montana program: Your Personal Wildland Fire Action Guide,” available at:

<http://dnrc.mt.gov/Forestry/Fire/Prevention/Documents/Final%20Montana%20RSG%20Guide.pdf> .

This program and the associated link to Fire Safe Montana <http://firesafemt.org/> provide resources to display to the public. Fire prevention programs in Park County schools, information booth at community events, (farmers market). Ready Set Go Action Guides can be distributed to individuals in high risk areas through mailings or during site visits. Education efforts should target homeowners, contractors, realtors, and insurance companies, emphasizing the homeowners’ responsibility to protect their homes.

### Private Property Owners Responsibility

Individual responsibility is paramount in reducing structural ignitability. As stated in Montana State Policies 76-13-115, State fire policy (6), “all private property owners and federal and state public land management agencies have a responsibility to manage resources, mitigate fire hazards, and otherwise prevent fires on their property.”

Fire science research has demonstrated that the ignition potential of structures, including homes, can be minimized by modifying the home itself and the area within 100 to 200 feet around the structure. A home should be examined for its vulnerabilities

# Park County Community Wildfire Protection Plan 2014

to firebrands and flames. Firebrand ignition factors include structure locations for firebrand accumulations on flammable surfaces and unscreened openings allowing firebrand entry.

Homeowners have control over the structural components of their homes and the “home ignition zone.” The effectiveness of fire suppression/protection is subordinate to the individual’s responsibility for ignition resistance of their home. Replacing flammable or highly ignitable components of the home and removing fuel from around the home minimizes the ignition potential of the home. The Ready Set Go Montana program provides information for homeowners to make decisions on mitigation efforts. Most Effective Changes to Home Ignition Zone

- Class A roofs: any roof covering that does not self-sustain an ignition and spread fire is an appropriate 'non-ignitable' roof covering
- Screen openings to prevent ember intrusion
- Install non-flammable siding
- Install double-paned windows
- Reduce fuel around structures
- Maintain vegetation modifications

For additional information, refer to Fire Safe Montana (Living with Fire - HOMEOWNERS' FIRESAFE GUIDE FOR MONTANA)

<http://firesafemt.townsquareinteractive.com/files/2012/05/Living-w-Fire-FSM-2009-1.pdf>.

Technical assistance and advice can be accessed through the Park County Fire Warden, Park County Fire Chiefs, and/or the RC&D Hazardous Fuel Reduction Grant Program to develop and implement (funding) a hazardous fuel mitigation plan or a forest stewardship plan. Contact Brad Bauer phone 1-406-388-3213, [brad.bauer@montana.edu](mailto:brad.bauer@montana.edu)

<http://www.msuextension.org/gallatin/naturalresourcesfire.html>

# Park County Community Wildfire Protection Plan 2014

## Plan Monitoring and Review

The Disaster Mitigation Act of 2000 requires that this plan be updated every five years. This does not mean rewriting the plan or redoing this entire process, but rather to review your mitigation plan. The hazardous fuel mitigation projects should be updated as the keeper of the plan becomes aware of new projects that might be implemented to mitigate a wildfire problem. The prioritized project list should be revised every year based on new data and available dollars. The entire plan should be reviewed and updated every five years. A review of this plan should be scheduled for no later than spring of 2019.

There are many opportunities for success in this plan. As those opportunities become reality, they need to be documented.

## Summary and Conclusions

The complexity of the wildfire environment has changed in Park County due to the increase of homes built in the WUI, changes in the wildland ecosystems and shifting weather patterns. The leadership and the level of fire preparedness within Park County have been able to keep pace with this changing environment through the efforts of the Park County Fire Warden, Park County FireSafe Coalition (PCFSC) and cooperative agencies. Continued support and increasing level of preparedness will be needed in the future.

# Park County Community Wildfire Protection Plan 2014

## Appendices

### Park County Rural Fire Department / Service (districts) Areas Contact and Fire Department Information

#### Park County Fire Warden

Gregory Coleman  
414 E. Callender  
Livingston MT, 59047  
(406) 222-4188

email: [gcoleman@parkcounty.org](mailto:gcoleman@parkcounty.org)

#### Cooke City Rural Fire District

Chief Dale Dempsey  
P.O. Box 106  
Cooke City, MT 59020  
(406) 838-2077

email: [dndemp1@centurylink.net](mailto:dndemp1@centurylink.net)

Volunteers in department: 13

Apparatus: Fire engine Type 3 (1) Park Service  
Fire engine Type 5 (1)  
Fire engine Type 6 (1)

#### Clyde Park Rural Fire District

Chief Tony Bailey  
P.O. Box 36  
Clyde Park, MT 59018  
(406) 686-4750

Volunteers in department: 9

Apparatus: Fire engine Type 2 (1)  
Fire engine Type 5 (1) DNRC  
Fire engine Type 6 (4)  
Water Tender Type 2 (1)

#### Gardiner-Gateway Hose Company

Chief Robert Kopland  
P.O. Box 307  
Gardiner, MT 59030  
(406) 848-7357

email in care of: [jsharrow@fs.fed.us](mailto:jsharrow@fs.fed.us)

Volunteers in department: 12

Apparatus: Fire engine Type 1 (3) one is located in Jardine.

# Park County Community Wildfire Protection Plan 2014

## Paradise Valley Fire Service Area

Gregory Coleman  
414 E. Callender  
Livingston MT, 59047  
(406) 222-4188

email: [gcoleman@parkcounty.org](mailto:gcoleman@parkcounty.org)

Volunteers in department: 14

Apparatus: Fire engine Type 1 (1)  
Fire engine Type 2 (1)  
Fire engine Type 3 (1) DNRC  
Fire engine Type 6 (2)  
Water Tender Type 2 (2)

## Park County Rural Fire District #1

Chief Dann Babcox  
304 East Park Street  
P.O. Box 1134  
Livingston, MT 59047  
(406) 222-0562

email [dbabcox@parkcounty.org](mailto:dbabcox@parkcounty.org)

Volunteers in department: 16

Apparatus: Fire engine Type 1 (2)  
Fire engine Type 2 (4)  
Fire engine Type 3 (1)  
Fire engine Type 4 (1)  
Fire engine Type 6 (1)  
Fire engine Type 7 (2)

## Wilsall Fire District

Chief Calvin Sarver  
P.O. Box 142  
Wilsall, MT 59086  
(406) 686-4570

email: [calnmarymt@hotmail.com](mailto:calnmarymt@hotmail.com)

Volunteers in department: 16

Apparatus: Fire engine Type 1 (1)  
Fire engine Type 2 (1)  
Fire engine Type 5 (1) DNRC  
Fire engine Type 6 (2)  
Water Tender Type 1 (1)  
Water Tender Type 2 / Fire engine Type 4 (1)  
Water Tender Type 3 / Fire engine Type 4 (2)



# Park County Community Wildfire Protection Plan 2014

## Reference Materials

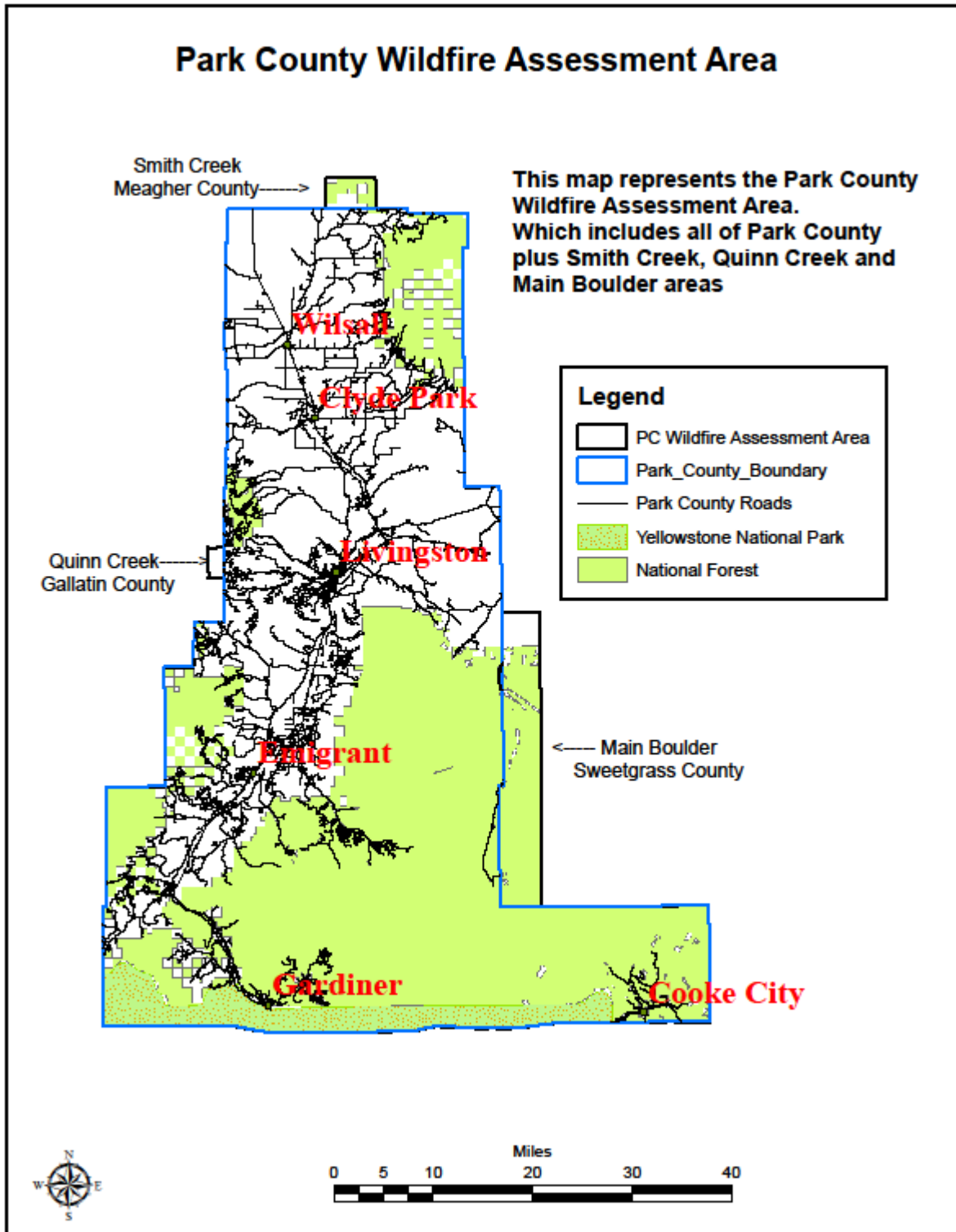
The following documents were used as references for the writing of the 2014 Park County Community Wildfire Protection Plan.

- COMMUNITY GUIDE to Preparing and Implementing a Community Wildfire Protection Plan August 2008
- Preparing a Community Wildfire Protection Plan – A Handbook for Wildland-Urban Interface Communities. March 2004
- A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Strategy Implementation Plan, December 2006
- Wildland Urban Interface Wildfire Mitigation Desk Reference Guide PMS 051 August 2014
- READY, SET, GO! Montana Wildland Fire Action Guide January 2014
- Predicting Behavior and Size of Crown Fires in the Northern Rocky Mountains. Richard Rothermel, 1991.
- The Healthy Forests Initiative and Healthy Forests Restoration Act, Interim Field Guide. February 2004.
- Field Guidance, Identifying and Prioritizing Communities at Risk. National Association of State Foresters, June 2003.
- Federal Registry, Part III, Urban Wildland Interface Communities within the Vicinity of Federal Lands That Are at High Risk from Wildfire. August 2001.
- Reducing the Wildland Fire Threat to Homes: Where and How Much? Jack D. Cohen, 1990.
- What is the Wildland Fire Threat to Homes?, Presented as the Thompson Memorial Lecture, April 10, 2000, at School of Forestry, Northern Arizona University, Flagstaff, AZ. Jack D. Cohen.
- 2006 Park County Community Wildfire Protection Plan.
- 2009 Winter Update Park County Community Wildfire Protection Plan.
- Fire Regime Condition Class Definition. Hann and Bunnell 2001.
- Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model by Joe H. Scott, and Robert E. Burgan. [http://www.fs.fed.us/rm/pubs/rmrs\\_gtr153.pdf](http://www.fs.fed.us/rm/pubs/rmrs_gtr153.pdf)
- FireFamily Plus Version 2.0 Larry Bradshaw, Erin McCormick 9/2000
- National Fire Danger Rating System (NFDRS) (Deeming and others 1977, Bradshaw and others 1984).

# Park County Community Wildfire Protection Plan 2014

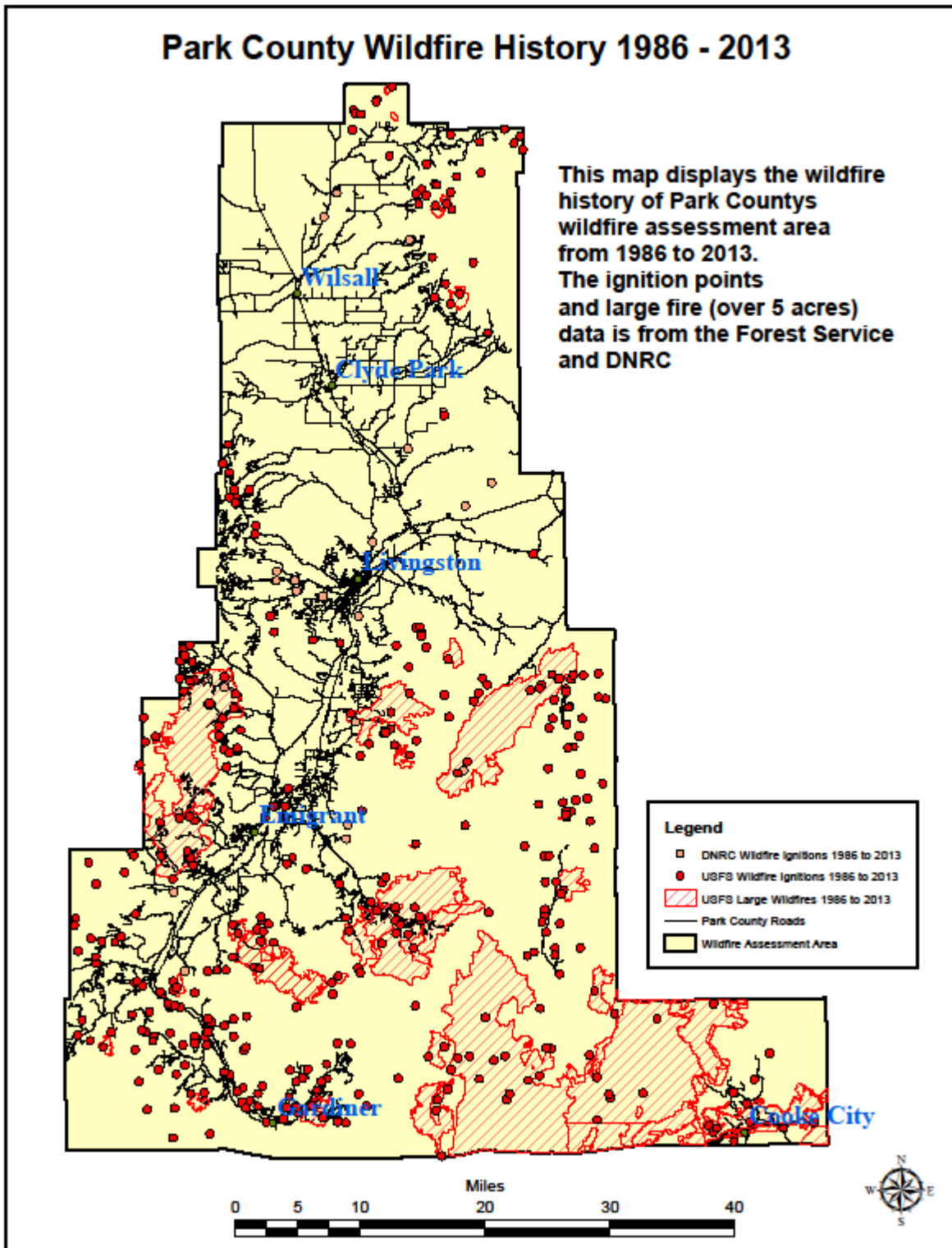
## Maps

### Park County Wildfire Assessment Area



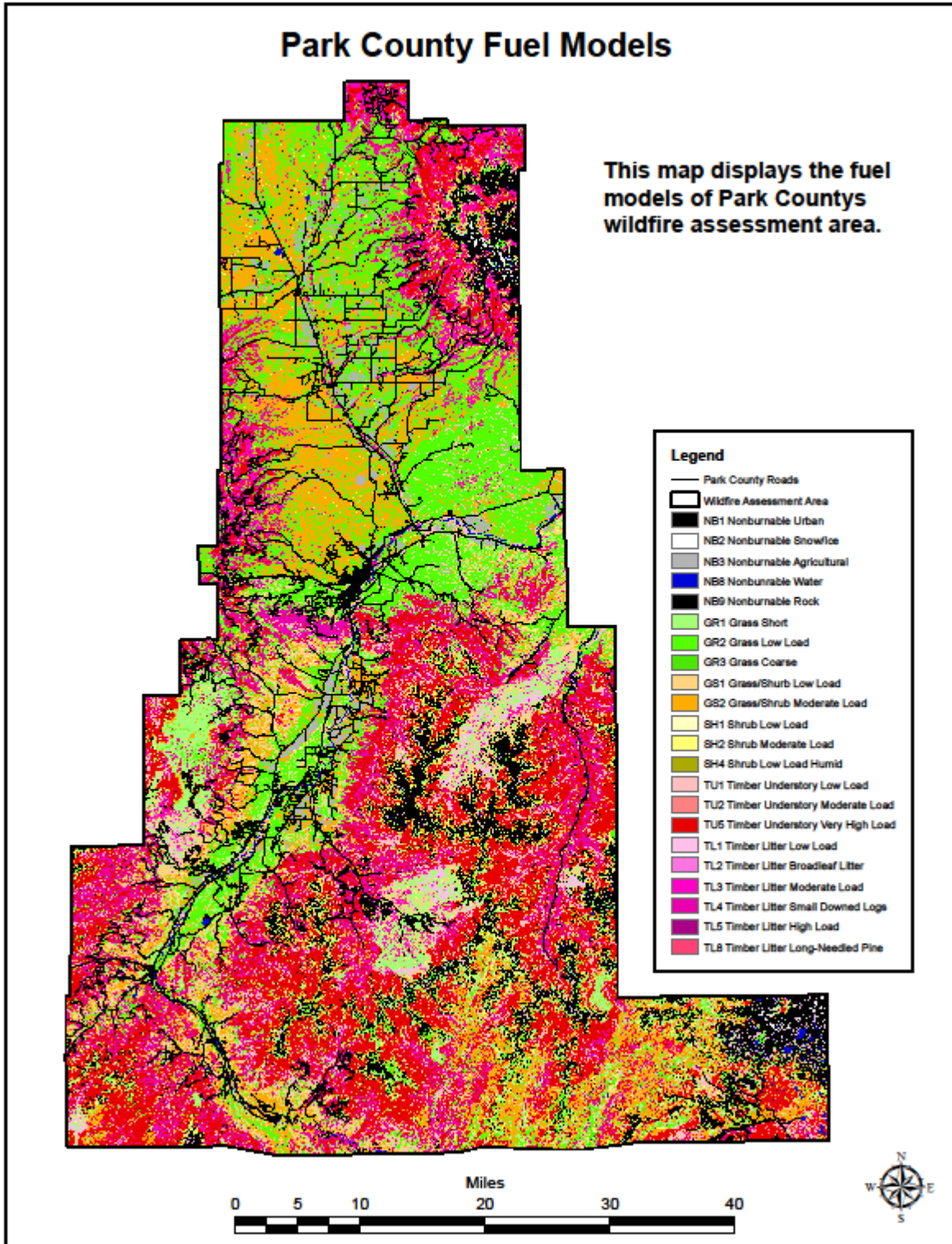
# Park County Community Wildfire Protection Plan 2014

## Park County Wildfire History 1986 - 2013



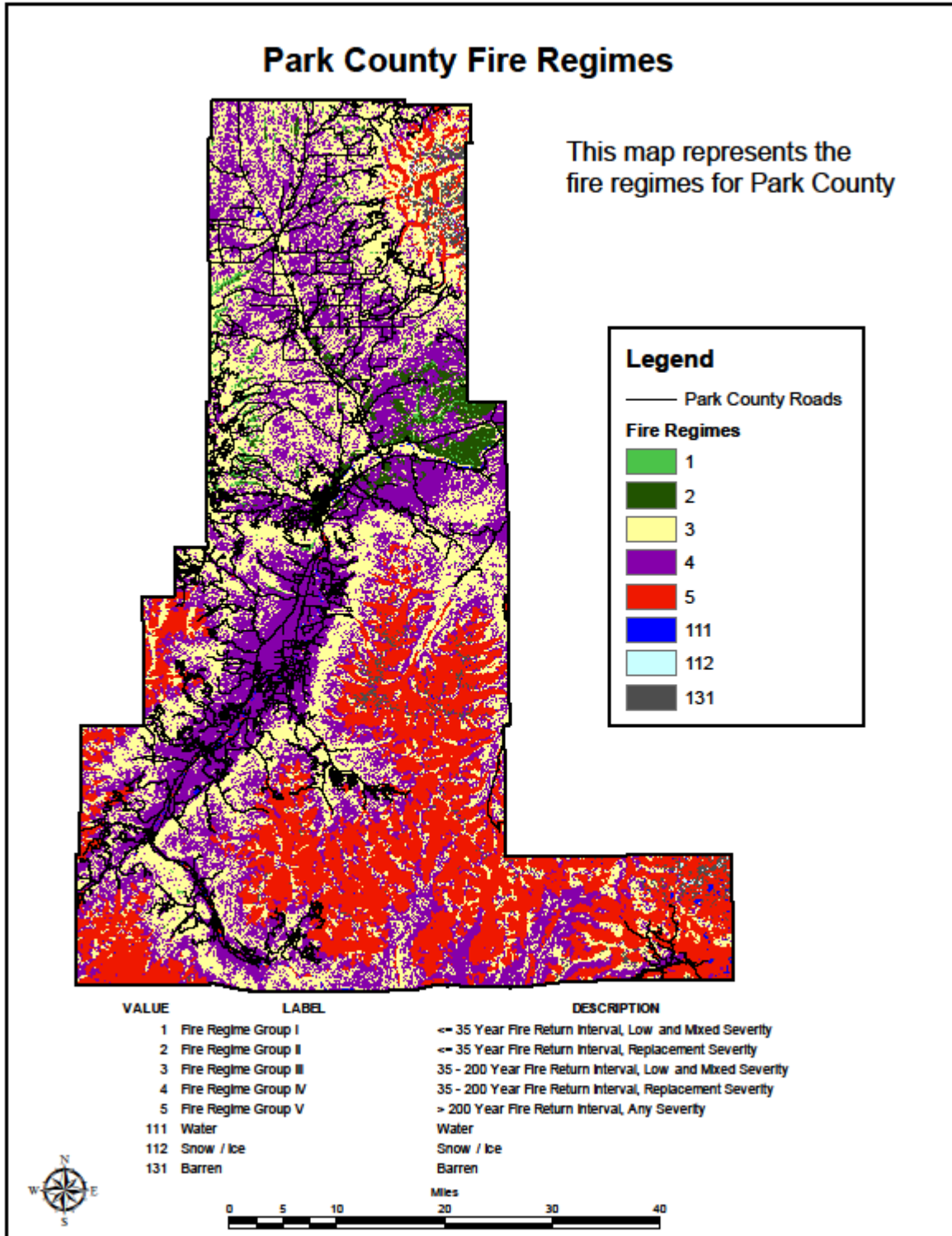
# Park County Community Wildfire Protection Plan 2014

## Park County Fuel Models



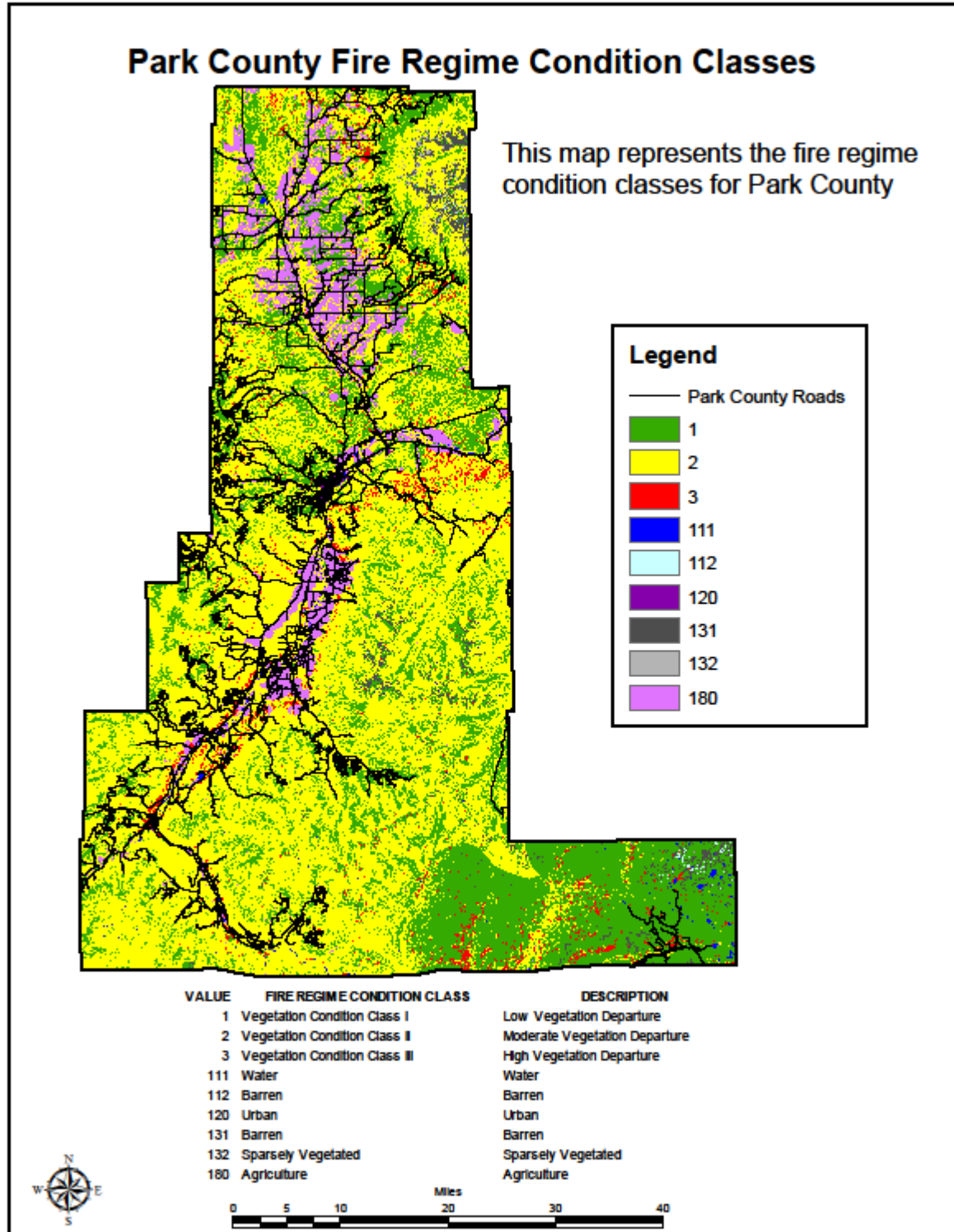
# Park County Community Wildfire Protection Plan 2014

## Park County Fire Regimes



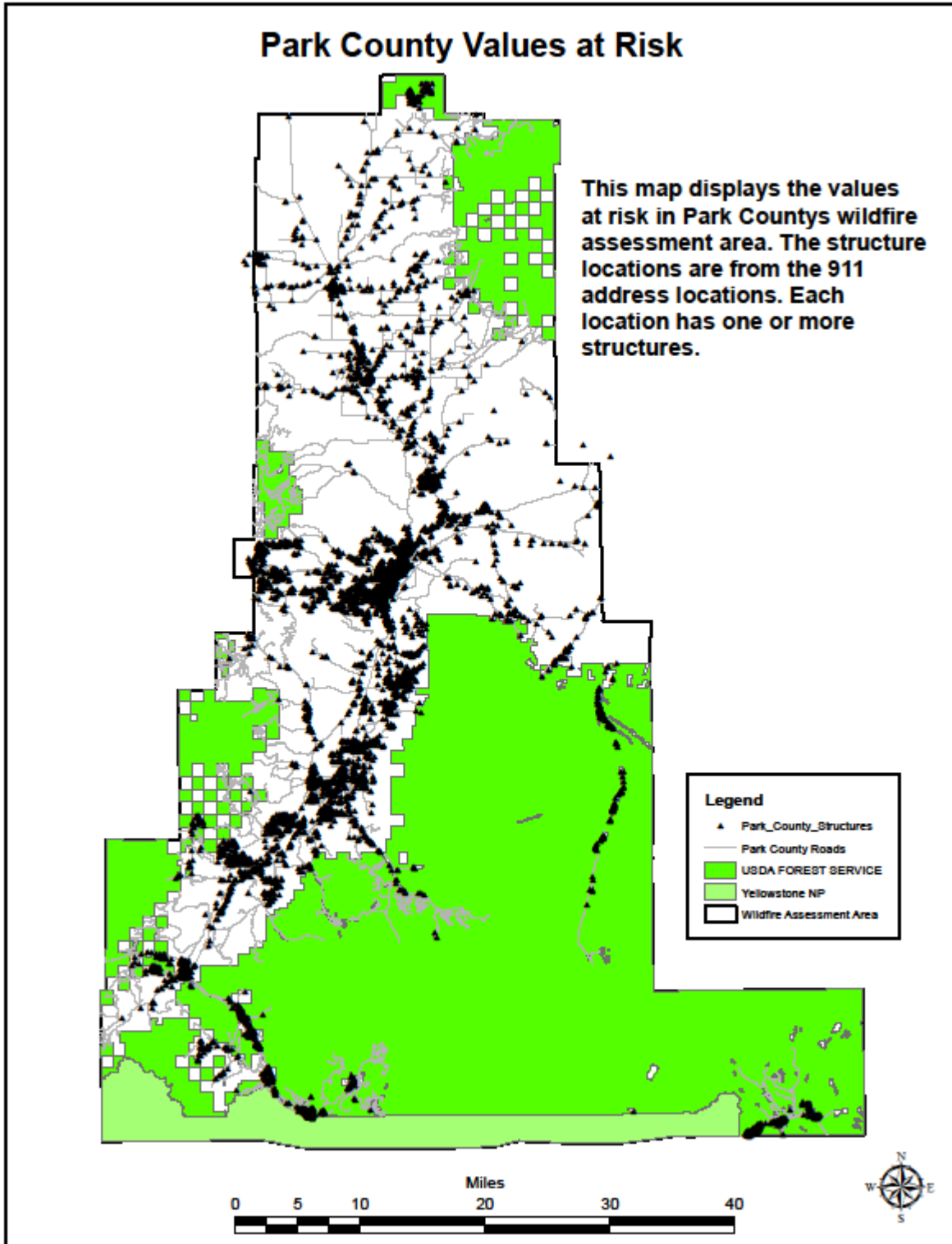
# Park County Community Wildfire Protection Plan 2014

## Park County Fire Regime Condition Classes



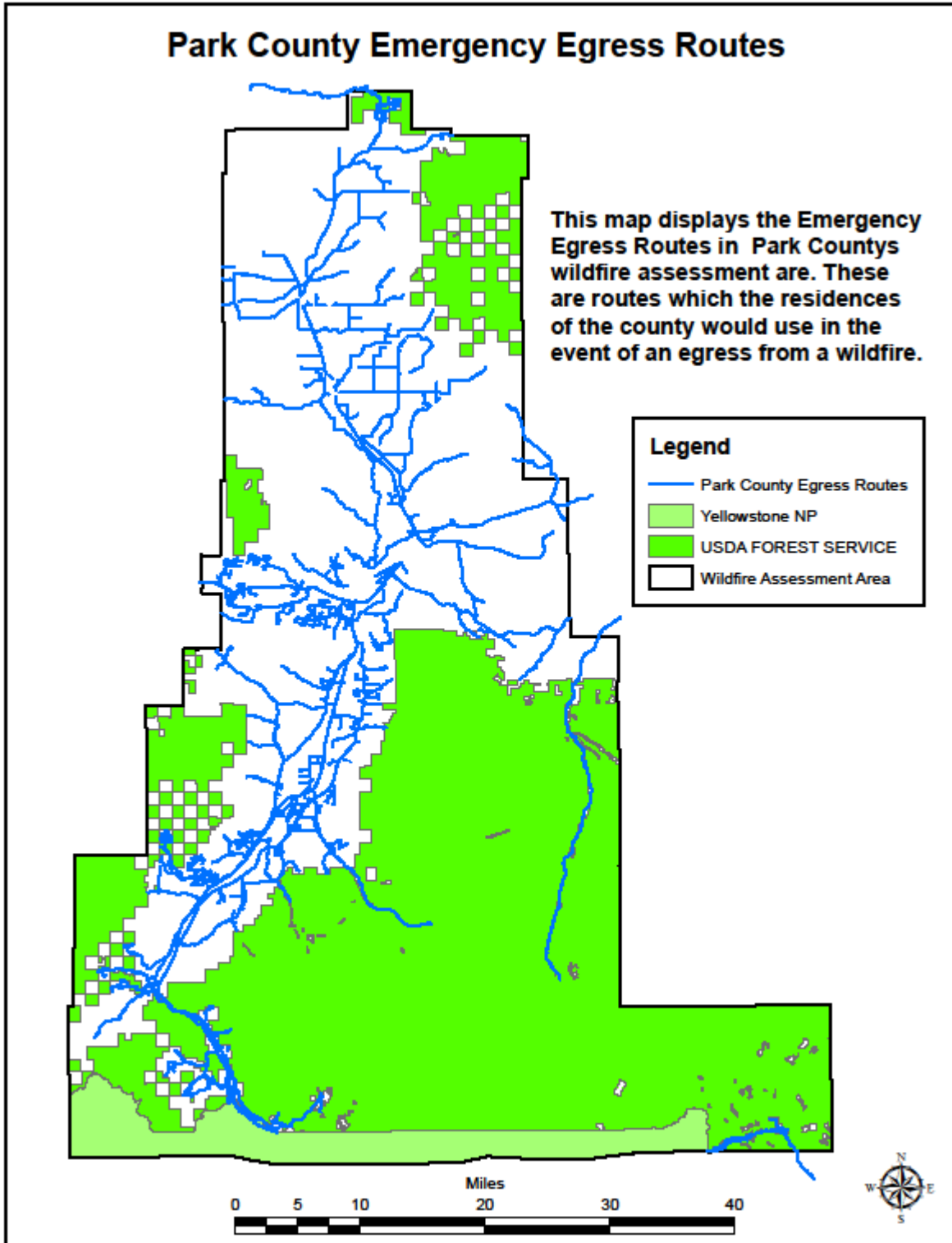
# Park County Community Wildfire Protection Plan 2014

## Park County Values at Risk



# Park County Community Wildfire Protection Plan 2014

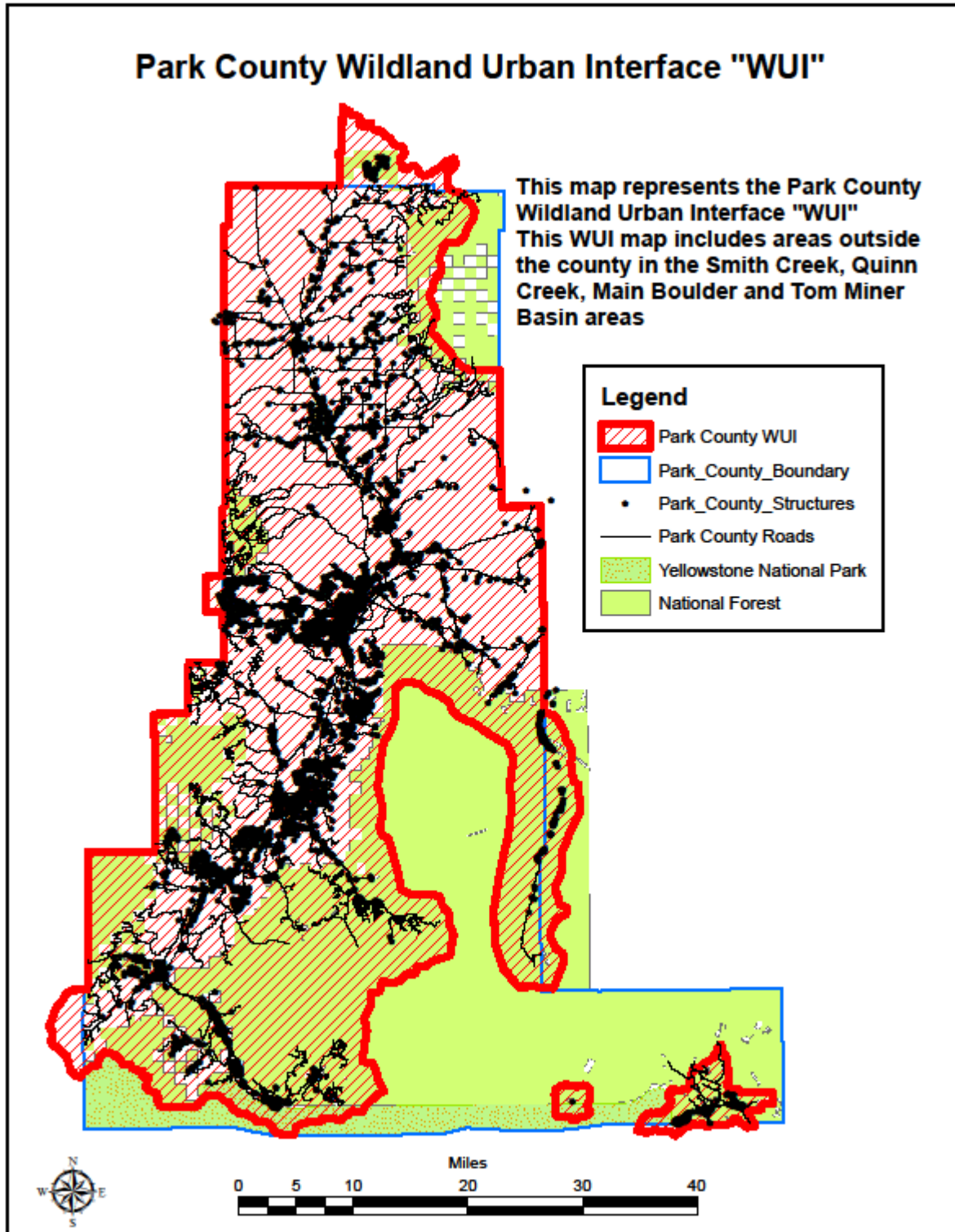
## Park County Emergency Egress Routes





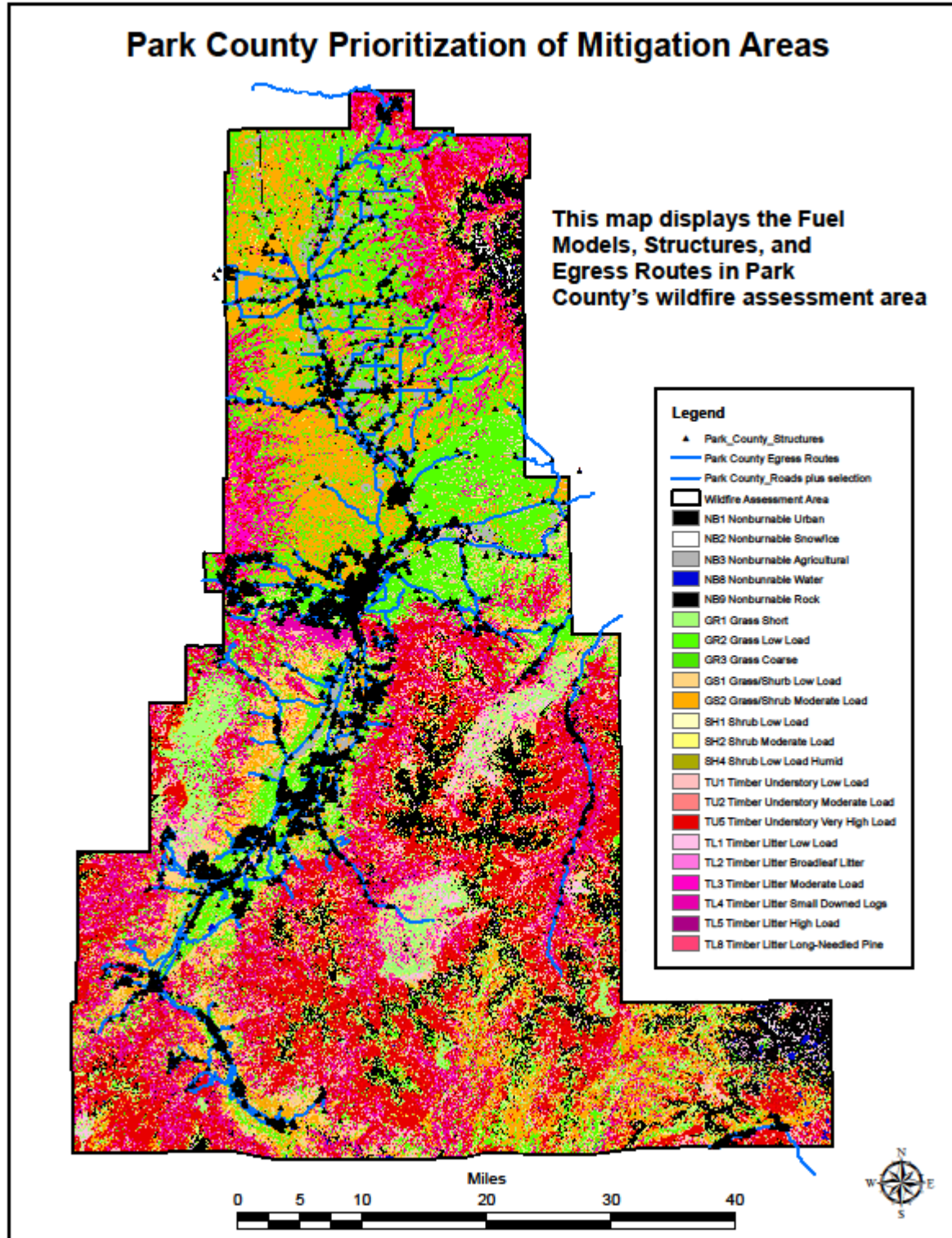
# Park County Community Wildfire Protection Plan 2014

## Park County Wildland Urban Interface "WUI"



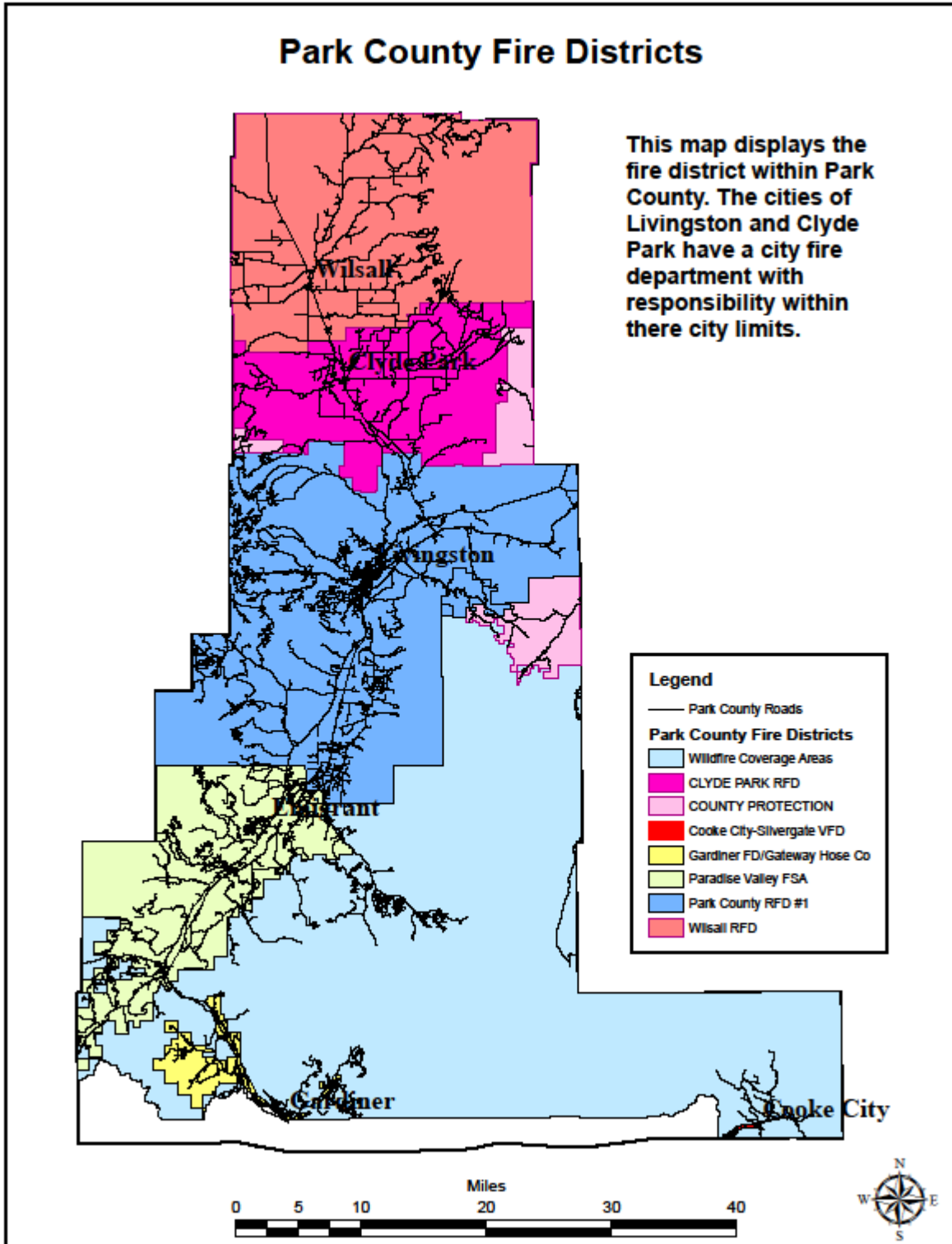
# Park County Community Wildfire Protection Plan 2014

## Park County Prioritization of Mitigation Areas



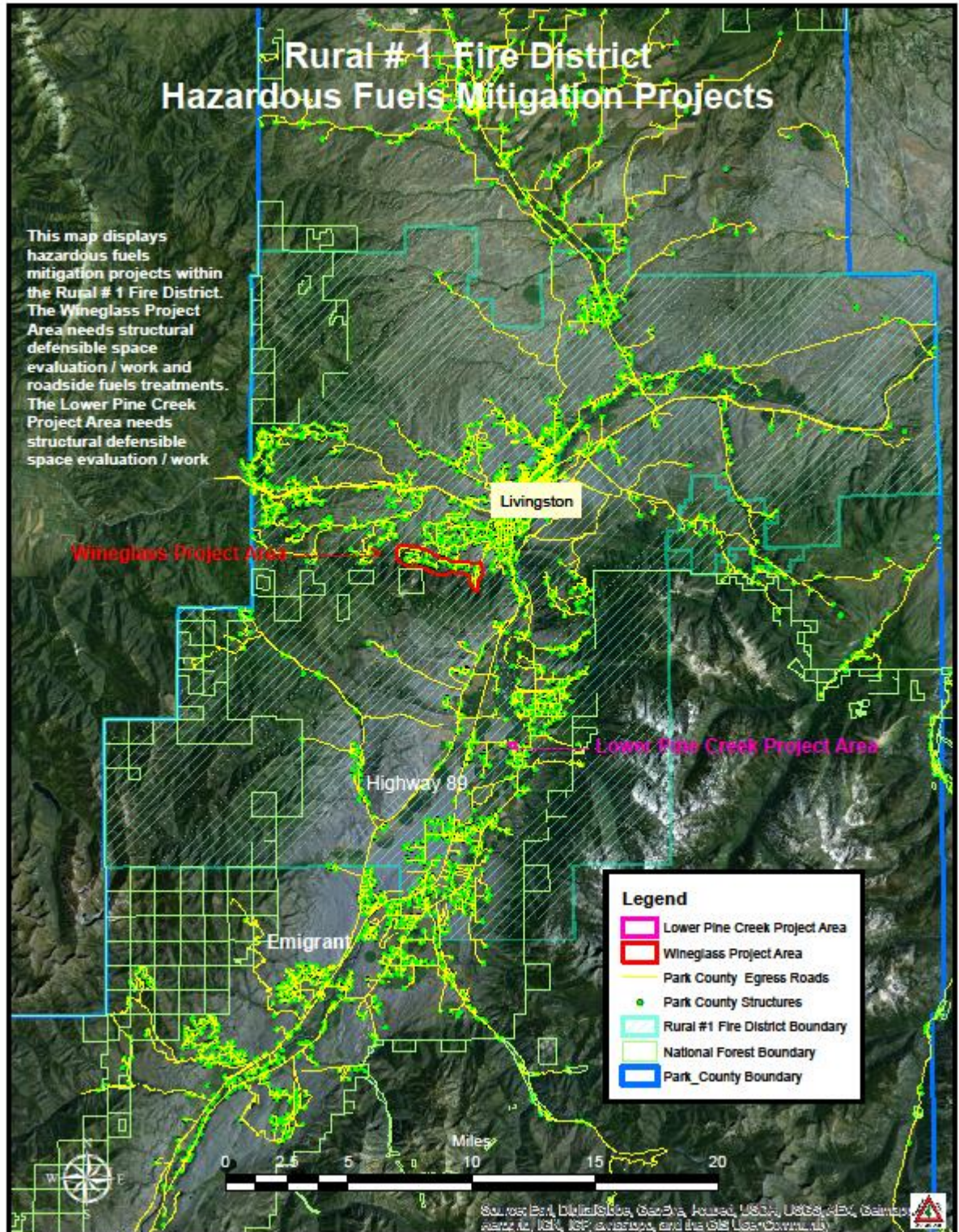
# Park County Community Wildfire Protection Plan 2014

## Park County Fire Districts



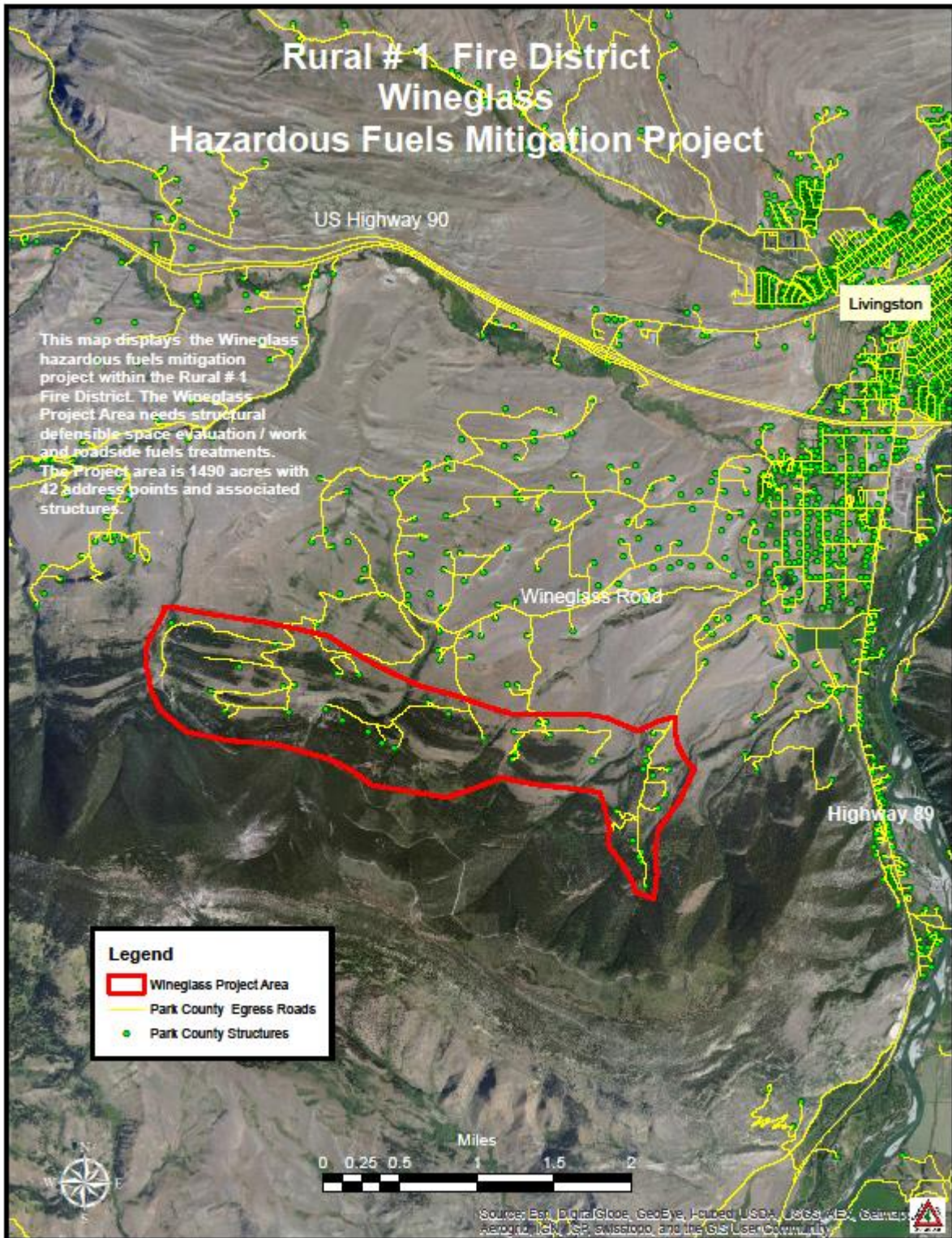
# Park County Community Wildfire Protection Plan 2014

## Rural #1 Fire District Hazardous Fuels Projects



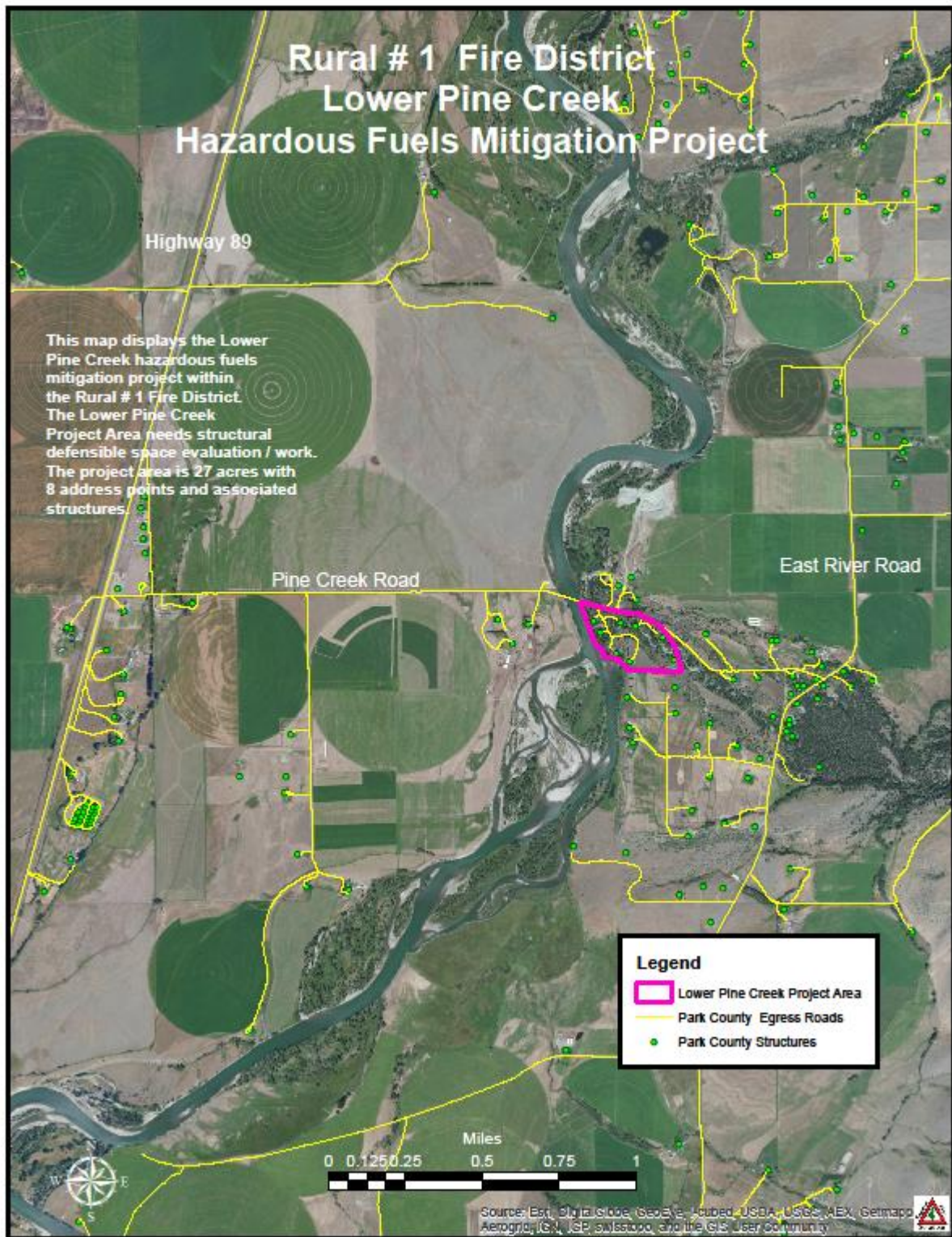
# Park County Community Wildfire Protection Plan 2014

## Rural # 1 Fire District Wineglass Hazardous Fuels Mitigation Project



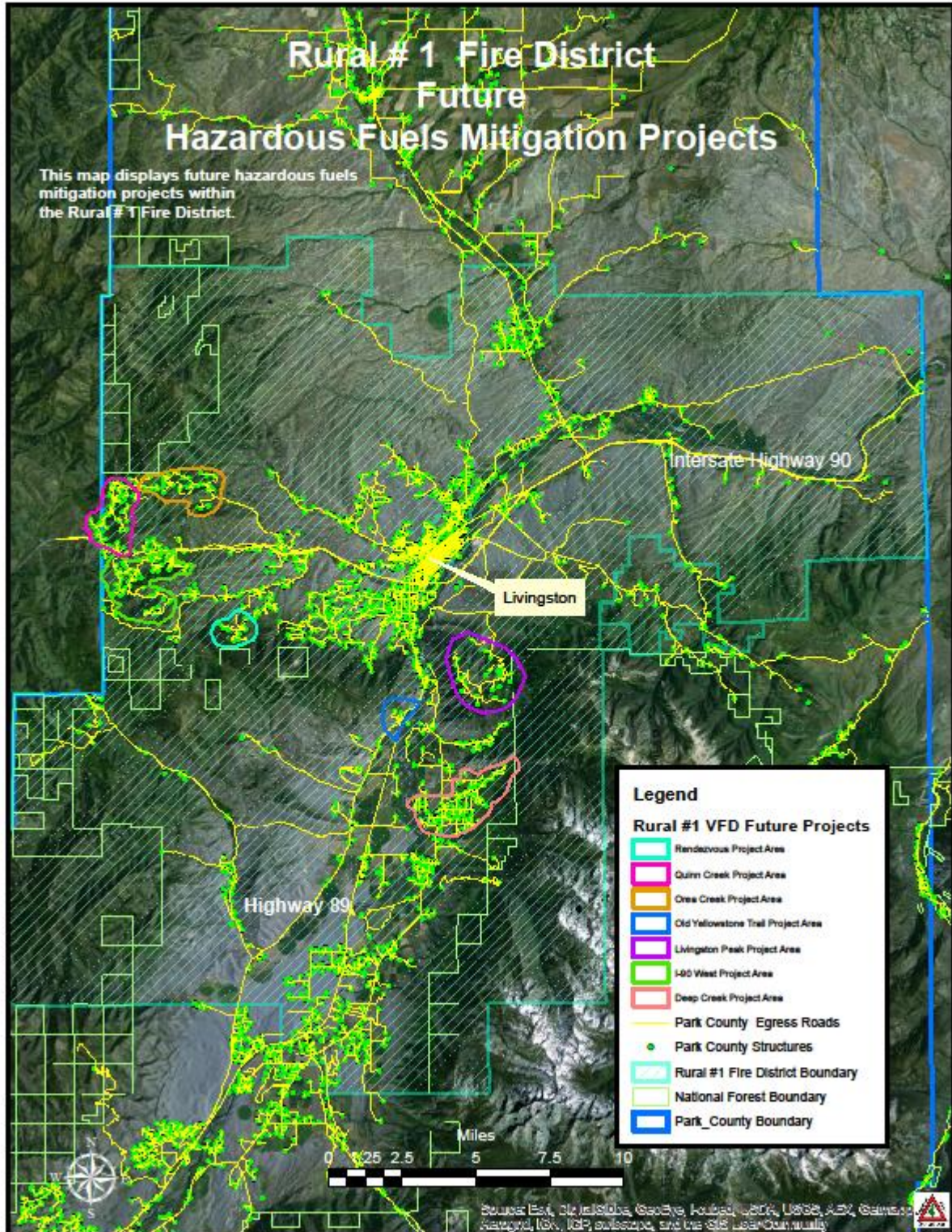
# Park County Community Wildfire Protection Plan 2014

## Rural # 1 Fire District Lower Pine Creek Hazardous Fuels Mitigation Project



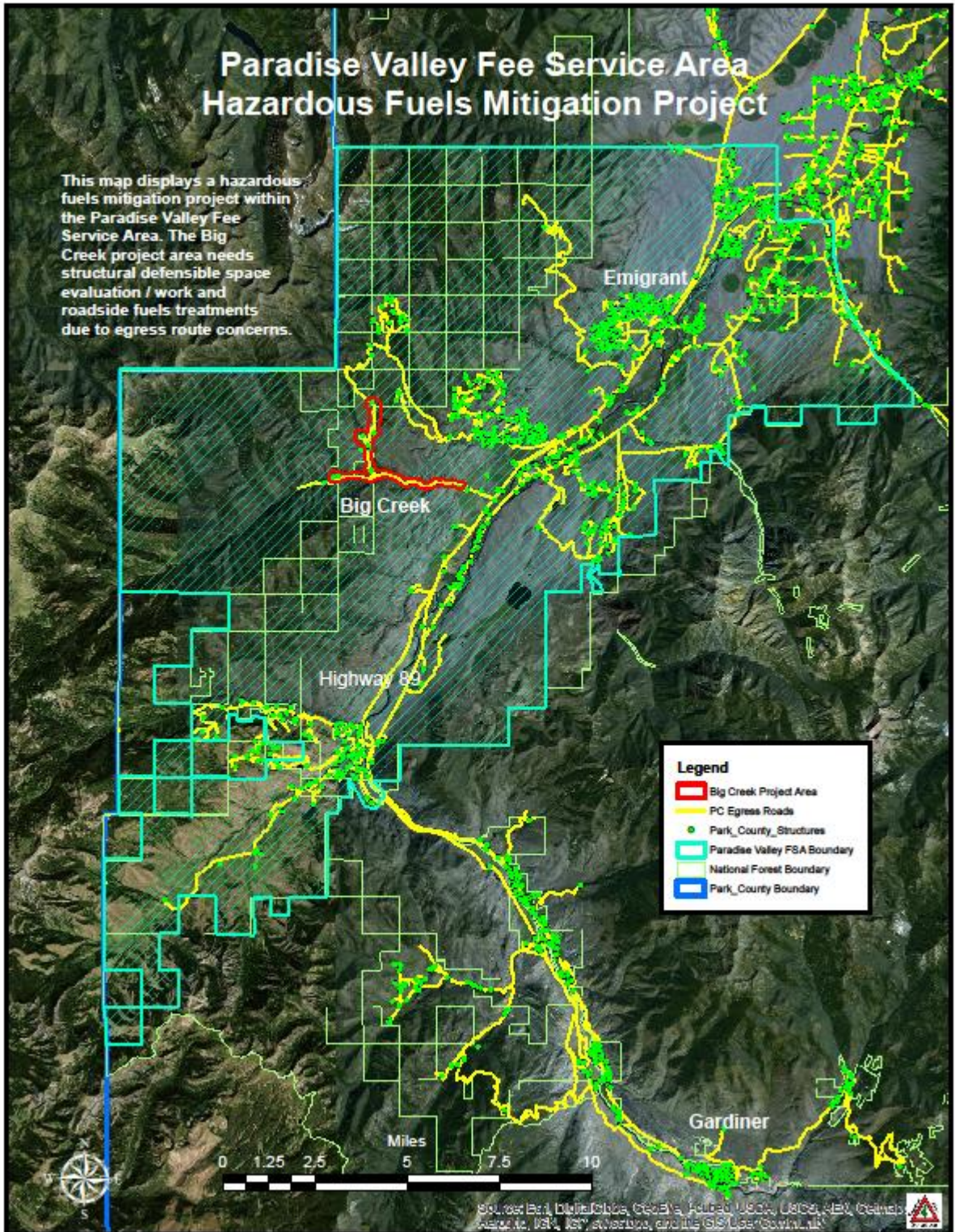
# Park County Community Wildfire Protection Plan 2014

## Rural # 1 Fire District Future Hazardous Fuels Mitigation Projects



# Park County Community Wildfire Protection Plan 2014

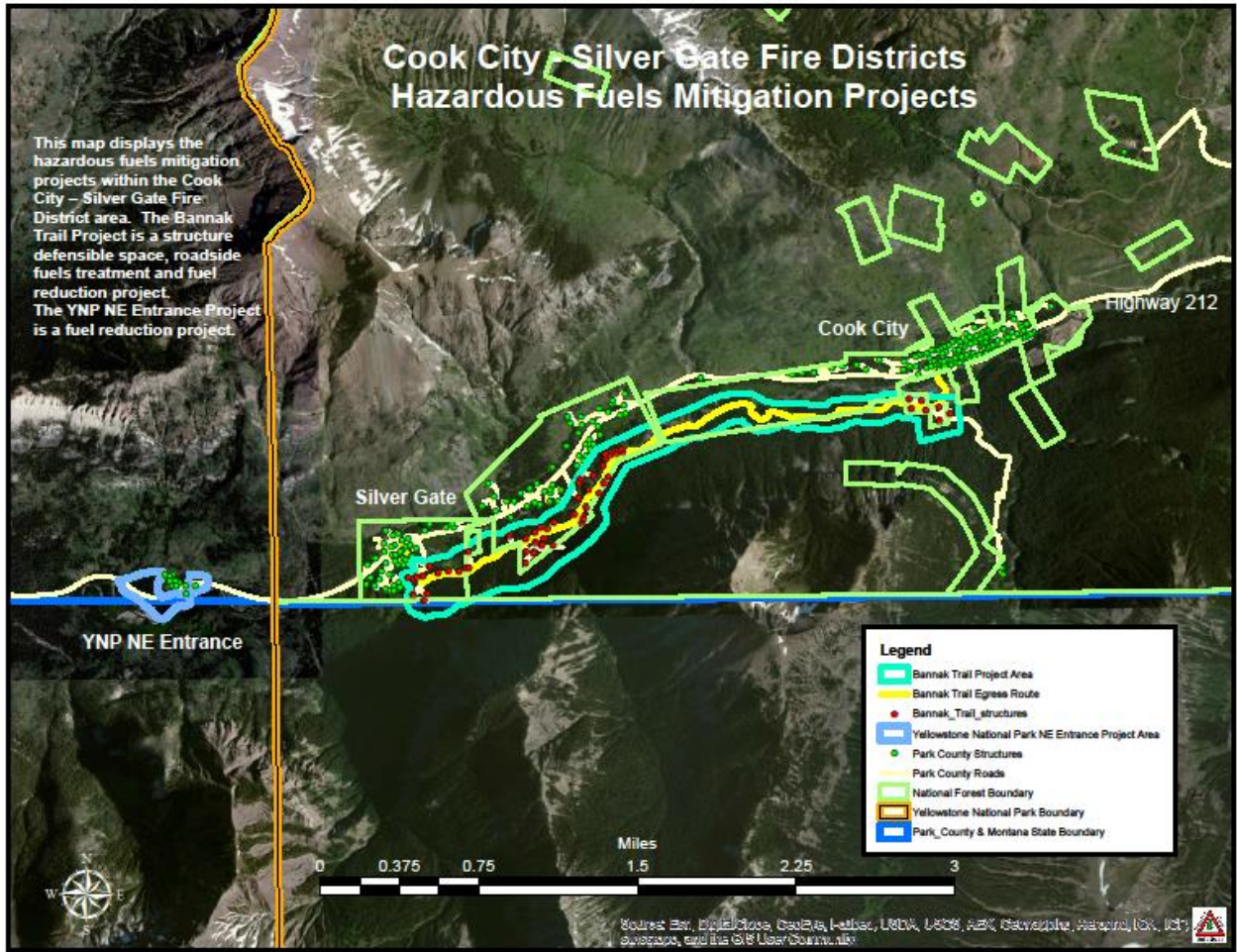
## Paradise Valley Fee Service Area Hazardous Fuels Mitigation Project





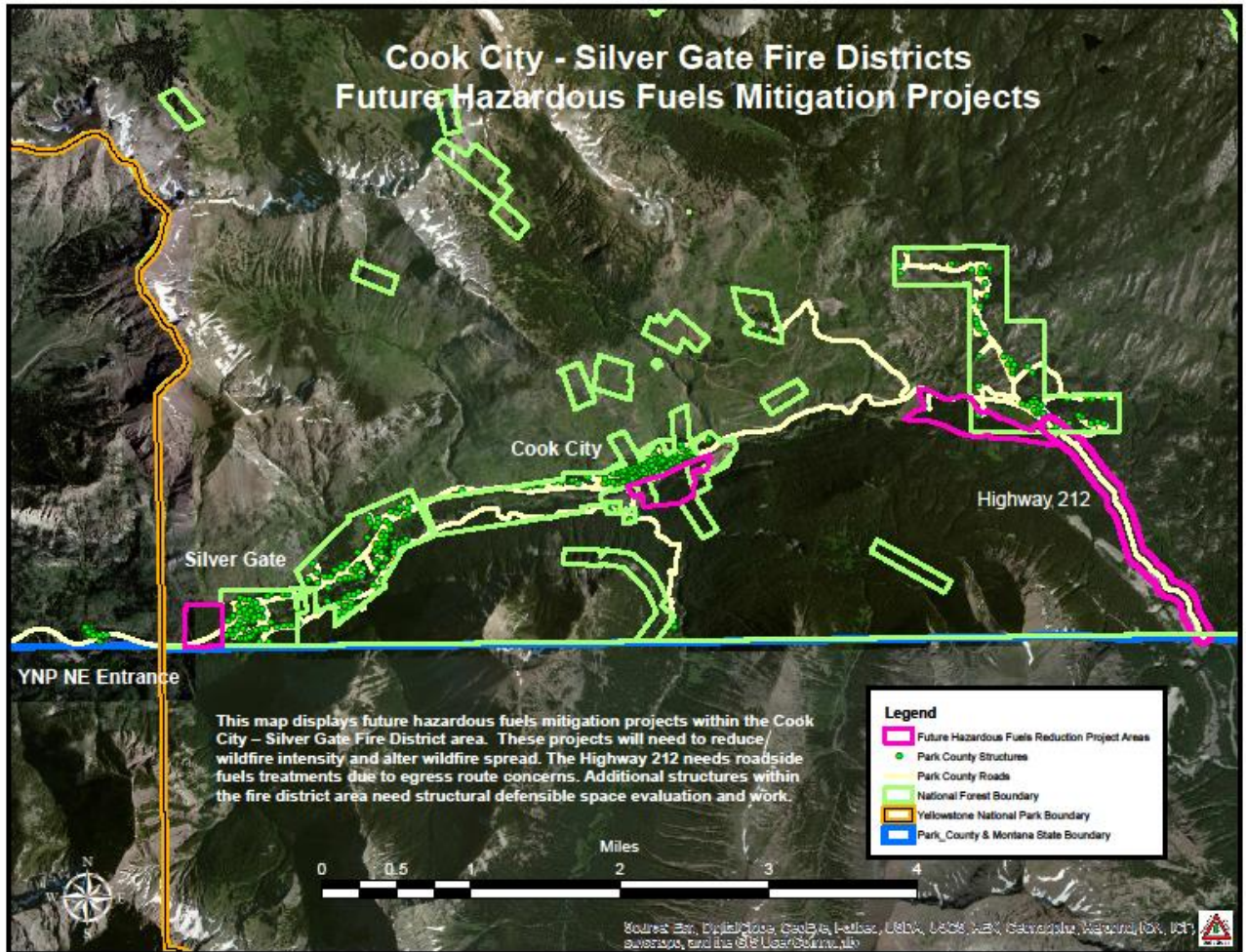
# Park County Community Wildfire Protection Plan 2014

## Cook City – Silver Gate Fire Districts Hazardous Fuels Mitigation Projects



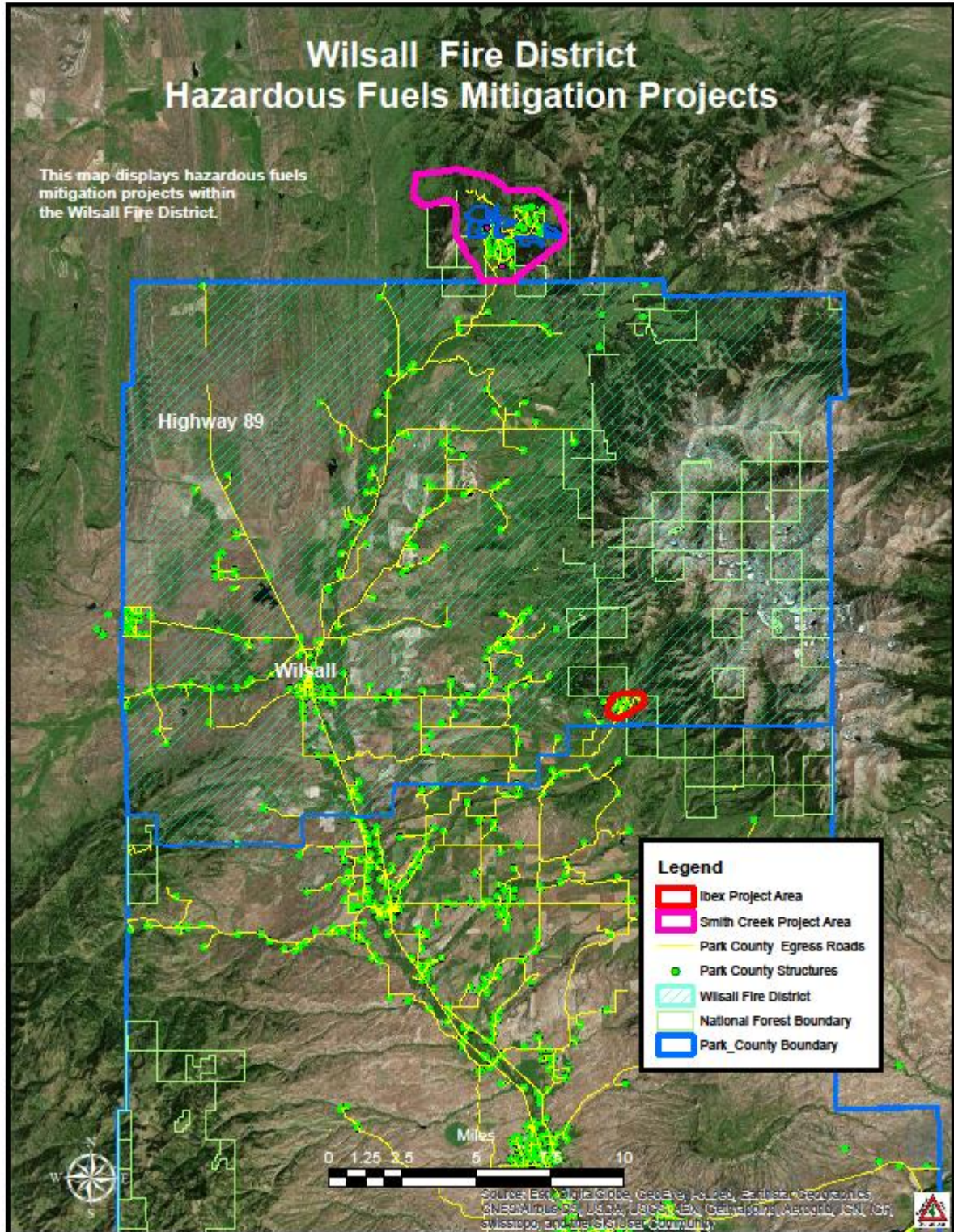
# Park County Community Wildfire Protection Plan 2014

## Cook City – Silver Gate Fire Districts Future Hazardous Fuels Mitigation Projects



# Park County Community Wildfire Protection Plan 2014

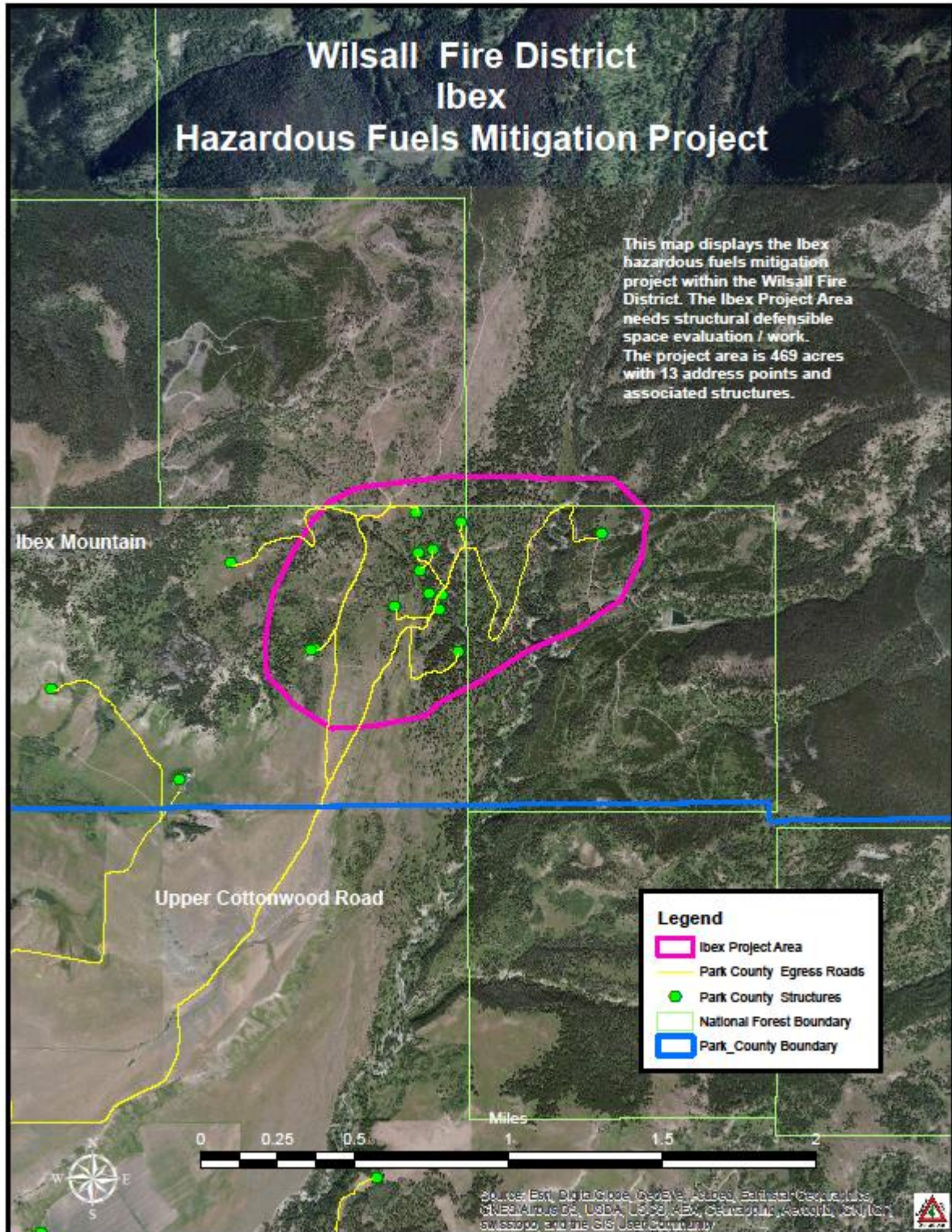
## Wilsall Fire District Hazardous Fuels Mitigation Projects





# Park County Community Wildfire Protection Plan 2014

## Wilsall Fire District Ibox Hazardous Fuels Mitigation Projects



# Park County Community Wildfire Protection Plan 2014

## Gardiner Gateway Hose Company Fire District Cinnabar Basin Hazardous Fuels Mitigation Project

