COMMUNITY WILDFIRE PROTECTION PLAN (CWPP)

Powell County, Montana

Prepared by: Planning Department of Powell County, Montana

March 2021

THIS PAGE INTENTIONALLY LEFT BLANK

PLAN
ACCEPTANCE

Local Government

Commissioner Doug Crachy

Commissioner, Ralph "REM" Mannix

Commissioner, Dan Sager

Local Fire Departments / Emergency Services

Avon Volunteer Fire Department
Chief, Reece Price

Ovando Volunteer Fire Department
Chief, Tony Lapka

Elliston VolunteerFire Department
Cheif, Ed Vanek

Race Track Volunteer Fire Department
Chief, Elmer McGhee

Garrison Volunteer Fire Department
Chief, Tom Gilbert

Rock Creek Cattle Company Fire Department
Chief, Willie Johnson

Helmville Volunteer Fire Department
Chief, Ty Daniels

County Fire Warden, Andy Scharff

Disaster and Emergency Services
County Coordinator, Britni Evans

Contents

1. Executive Summary

The Community Wildfire Protection Plan (CWPP) for Powell County, Montana has been updated by the Powell County Planning Department. This plan updates comes with the anticipation of a full rewrite after funding has been secured.

Purpose Statement

The purpose of the CWPP is to develop and implement management strategies that protect assets at-risk from wildfire in the wildland-urban interface (WUI). These assets including lives, homes, businesses, and essential infrastructure with appropriate consideration for other community values. The overall goal is a collective effort to help make Powell County more prepared for wildfires and reducing potential impacts.

Overview

Development at the edge of forest or grassland areas is what is referred to as the Wildland Urban Interface (WUI). The WUI is a unique zone where structures are near undeveloped wildland or vegetative fuels. These areas experience a greater potential risk of wildfire. The WUI is an attractive area to live, due to the proximity to nature. This can make firefighting and emergency response delayed, difficult, and very expensive. Through the development of a CWPP, Powell County aims to reduce the risk of 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:

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; and
3. Recommends measures to reduce the chance that a fire will ignite structures throughout an at-risk community.

Stakeholders and Plan Development

The development of the CWPP required active collaboration of interested Powell County stakeholders. Principal CWPP stakeholders included the local government, the local fire departments, and the Montana Department of Resources and Conservation (MT DNRC), with technical support and resource management input also received from the United States Department of Agriculture: Forest Service (USFS).

The Planning Department used historical and local knowledge to develop this plan to identify areas of increased risk. Input from public stakeholder groups was additionally encouraged through public notices published in the Silver State Post (Appendix A).

To further maximize stakeholder outreach, a draft of the Powell County CWPP was emailed to a group of core stakeholders on March 25, 2021. A two-week review period happened after and stakeholder comments were incorporated, and on April 20, 2021 the Final Draft, was posted via the Powell County website and accepted through resolution 2021-12. Notification of the posting was issued through public notice.

Montana Forest Action Plan (2020)

The purpose of the Montana Forest Action Plan (MFAP) is to help identify areas that are at risk for wildfire and where to utilize mitigation activities to make Montana forests a safer and healthier place.

The MFAP aims to provide financial aid to communities and landscapes that have areas of higher wildfire risk in the state of Montana. The Montana Forest Action Plan convened key statewide stakeholders and tribal nations to reassess statewide forest conditions, identify priority areas for treatment, and develop a cross-boundary plan to accomplish landscape-scale forest restoration.

The plan consists of three main parts.

- Montana Forest Action Plan: The Montana Forest Action Plan provides recommended goals and strategies to help promote cross-boundary, landscape scale forest restoration and management.
- The Priority Areas: The Priority Areas for Focused Attention show the places in Montana that would benefit most from cross-boundary work.
- The Assessment: The Statewide Assessment of Forest Conditions provides an updated analysis of forest conditions and trends.

The Wildland-Urban Interface

Section 101(16)(B)(ii)) of the HFRA offers a definition of Wildland-Urban Interface (WUI) but communities are also encouraged to use the CWPP process to derive their own definition of WUI within their county. The WUI is defined as "the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels," as stated in the Glossary of Wildland Fire Terminology. Powell County has defined its own WUI. The methodology and a map showing the WUI area in Powell County are contained within the CWPP in Chapter 4.

Implementation, Monitoring, and Review

County stakeholders generated a list of wildfire mitigation strategies in the original CWPP, that may be used to reduce WUI risk conditions. Further higher detail planning will need to be completed before mitigation activity can occur. Higher detail plans will incorporate one or many of the following strategies:

- Fuels Management

- Education/Prevention
- Planning
- Development
- Training
- Inter-Agency Cooperation

Building on the mitigation strategies outlined above, the CWPP also contains information on reducing risks to structures. The planning department also provides a wildfire checklist for all new residential builds within Powell County. Concepts introduced are primarily borrowed from the Firewise™ program and was developed with Headwaters Economics.

To ensure appropriate implementation of the Plan, the formation of a Monitoring Committee is recommended. This committee should be formed under the County Fire Council, and should conduct a minor review every year and a major review of the Plan in year 9 of implementation. Major review can also be initiated at any time during the life of the CWPP as determined by the Monitoring Committee.

2. Background

General Information

Located in west-central Montana, Powell County is a long, narrow county extending north to within the Bob Marshall Wilderness and south to the city of Deer Lodge. Powell County encompasses approximately 2,330 square miles and contains mid to high-elevation mountain ranges that extend to greater than 9,000 feet above mean sea level. Habitats range from dry grassland in the southern portion of the County to snowy alpine areas primarily in the north.

The City of Deer Lodge, located in the south extent of the County, is the county seat and the largest city in the County. Historically ranching, timber harvesting, and the railroad were responsible for the County's development. Today government is the leading employer. The State of Montana is a major County employer with the State Prison west of Deer Lodge, and the State Hospital in adjacent Anaconda-Deer Lodge County.

Ranching and timber harvesting remain the major natural resource uses in Powell County. The largest corporate employer in the County is Sun Mountain Lumber, Inc. Ranching remains a significant way of life for many Powell County resident's.

In an effort to foster economic growth within the County tourism and recreation are currently being encouraged. Changes associated with a growing tourism industry will likely present new interface challenges as more people and development come into contact with wild areas.

Climate

The United States National Weather Service station in Deer Lodge has maintained records since 1959. The area is subject to a continental weather regime experiencing a maximum annual average daily temperature of 55.5 degrees Fahrenheit and minimum of 26.0 degrees Fahrenheit. The warmest month of the year is July with an average maximum temperature of 80.1 degrees

Fahrenheit and the coldest is January with an average low of 8.7 degrees Fahrenheit. Average annual precipitation in Deer Lodge is
10.66 inches. June is the wettest month with 1.84 inches and February is the driest with 0.33 inches.

The large-scale weather patterns in Powell County are greatly variable and influenced by the Flint Creek Mountain Range to the west and the Continental Divide to the east; the Garnet Mountain Range is to the north and the Pintler Mountain Range is to the south. Local small-scale variability in temperature and moisture occur throughout the County because of natural terrain variation. Generally, moisture levels tend to be highest at middle elevations, on north-facing slopes, and in sheltered valleys. Relatively dry sites can be found on low south-facing sites and high-elevation windy ridges. Temperature is also affected by terrain. High-elevation terrain and shaded, north-facing slopes at lower elevations exhibit colder temperatures. Low-elevation sites and south-facing slopes tend to be warmer. A greater discussion about how the climate affects the WUI is found in Chapter 4.

3. Population and Development

Total County-wide population in 2019 was estimated by the U.S. Census Bureau at approximately 6,854 people. The city of Deer Lodge remains the largest city in Powell County, with a population of 2,934 or 43% of the County total.

Although Powell County has not experienced the population influx seen in many communities in western Montana, the County has seen growth in the number of developments in the WUI. During 2020-2021 Powell County saw an increase in septic permits and development certificates.

Land and Fire

The terrain in Powell County consists of rolling hills or rugged mountains separated by areas of broad open valley. The upland area of the county consists of a sagebrush-juniper habitat, coniferous forest, and in many places, coniferous forest with a deciduous quaking aspen or mountain alder component. Tree species found in the County include Douglas-fir, black cottonwood, juniper, lodgepole pine, quaking aspen, ponderosa pine, sub-alpine fir, western larch, western red cedar, and whitebark pine. Wildland structure and composition are highly variable and change naturally with elevation, aspect, geology, and fire history.

Public land management agencies and private landowners once intensively managed large portions of County forest for natural resource production. Recently much of the historic large-scale forest resource industry has ceased to exist. Agriculture continues to play an important economic role in Powell County with much of the valley bottomland and inter-mountain prairie, located primarily in the south, and around Ovando in the north, remaining in livestock and crop production. Most of these agricultural lands are privately owned, with many also being covered with conservation easements.

Land Ownership/Administration

Land in Powell County is owned/managed by six primary entities: private non-industrial landowners, USFS, BLM, Montana State, U.S. Fish and Wildlife Service,

and timber companies. Part of the Bob Marshall and Scapegoat Wilderness areas administrated by the USFS (276,504 Acres) exist in the northern portion of the County.

Table 1: Land Ownership & Acreage

Administration Agency / Owner	Acres	% of Total
The United States of America	749,342	50.25
State of Montana	104,986	7.04
Other (Private Landowners & Railroad)	636,636	42.71
TOTAL	1,490,964.	

The majority of fires that affect Powell County occur in July, August, and September. These months have a higher temperature, drier air, and an increased incidence of lightning strikes. These factors create an increased risk and conditions conducive to the ignition and rapid spread of wildfire.

Fire suppression has denied the natural role of a major ecological force in forests and has generally resulted unhealthy forested growth. The negative impact of fire suppression can be observed in the forested areas of Powell County. The impacts can be seen in areas that are over-stocked, insect- and disease-infested, and fire-prone.

Deteriorating forest health along with increased development in remote areas has resulted in a higher risk of wildland fires. Continued public education and outreach effort should further emphasize the natural role of fire and other mitigation strategies in the WUI landscape.

Values at-Risk

Powell County stakeholders have identified values at-risk to loss during catastrophic wildfire. As set forth in the Montana Code Annotated (7-33-2202), Powell County is responsible for the protection of the County's range, farm, and forestlands from fire. This statute aims to protect areas with manmade and natural values at-risk from wildfire. Specific values at-risk within the WUI include lives, homes, businesses, historic structures/districts, and essential infrastructure. Natural values at-risk include surface water quality, ecological stability, and forest resource health.

Human Life

It is estimated that almost 1,500 structures are with the Powell County WUI. Although the residents are not likely to stay in harm's way during a wildfire they may be inadvertently at risk of being trapped during a catastrophic fire. Evacuation plans are in place for the County and are discussed at greater length in the Emergency Operations Plan (EOP).

Civilians are not likely to be present during a wildfire event, however, firefighters will likely be in the area. Firefighters are faced with trying to protect natural and manmade values from wildfire. Wildland firefighters are well-qualified and trained to do their job but the dangerous conditions they encounter are continually changing and pose a constant threat to life.

Factors that increase firefighter danger vary with geographic region, local weather, vegetation type, slope, time of year, and time of day. An index such as the energy release coefficient (ERC), derived on a day-to-day basis by fire behavior specialists, is given to firefighters at the daily fire event briefing. An interpretation of fire danger can be made from that day's index.

Significant Sites

The National Register of Historic Places contains 13 listed sites in Powell County, 9 of which are located within the city of Deer Lodge. The remaining four sites are scattered across the County and include the Charter Oak Mine and Mill near Elliston, Fitzpatrick Ranch Historic District northwest of Avon, the Grant Kohrs/Warren Ranch located at the edge of Deer Lodge, and the Northern Pacific Railroad Completion site at Gold Creek off of I-90.

Developing a monetary value for historic sites is trivial, as their benefits to society are invaluable.

One other important structure, located in the WUI, not of historic importance but of high value to Powell County and the State of Montana is the Montana State Prison. The Prison is located 3.5 miles west of Deer Lodge.

Forest Resources

The monetary value of the forest in Powell County is difficult to assess. The values for recreation and aesthetic alone, are difficult to assign monetary values to, let alone the natural processes the forests facilitate.

Fire Preparedness

A community's ability to fight any fire once ignited is determined by its capacity to respond, confine, and extinguish a fire incident. Powell County has thirteen fire departments. The department crews also work with USFS, BLM, and MT DNRC to provide initial attack response and support for these fire incidents. Wildfire protection agreements are in place to provide mutual aid between all capable response departments and agencies for the County and adjacent counties. Fire suppression jurisdictions for each of the agencies or departments are depicted in Figure 1. These districts are response only and do not show the legal fire districts of Powell County.

Powell County gained entry to the Montana State/County Cooperative Firefighting Program by action of the 1993 Legislature. Through the "County Coop" program, Powell County provides protection to all state and private lands in the county that are not protected by the USFS or DNRC (all BLM lands within the county are protected by DNRC). Powell County's local government fire forces provide primary initial fire attack and, in most cases, extended attack on wildland fires in their respective jurisdictions. In return for this service, cooperating counties receive DNRC support in the form of organizational and technical assistance, equipment, training, and direct fire control assistance when needed. When a wildland fire exceeds the capacity of the County, the DNRC will intervene to assist, bringing to bear the considerable resources of the State and its federal partners at no cost to the benefitting county.

Figure 1: Dispatch Districts, Powell County

During bad wildfire years, crews and equipment are often pushed past the limit of their response capabilities. Continued interface development, further forest condition deterioration, increasing live and dead forest fuel concentration, and sustained drought have the potential to place even greater demands on fire response crews.

Powell County has completed a pre-disaster mitigation plan (PDM) with the aim to improve overall emergency preparedness for the County. The PDM recommendations and conclusions overlap the CWPP in the area of County fire defense and preparation.

Critical Facilities At-Risk

Fire preparedness depends on resources being available for firefighting. Critical facilities in the WUI that are at-risk to potential catastrophic wildfire include the MT DNRC Offices near Clearwater Junction and MT DNRC Garrison Initial Attack Station near Garrison. The MT DNRC Offices and Initial Attack Station are critical to fighting wildfires and loss of the structures as a result of fire would in turn leave inadequate firefighting resources within the County. The MT DNRC has created an area around the structures that will enable defense from wildfire.

Please refer to the PDM for further information and discussion of critical- and non-critical facilities and vulnerable structures in the remainder of the County.

Evacuation Plan

Powell evacuation policies have been developed in the County EOP. It is suggested that further wildfire specific evacuation planning be undertaken. Wildfire evacuation routes, marshalling points, and procedures need to be pre-established for the County.

WUI residents and homeowner associations should also be encouraged to preplan for evacuation scenarios and familiarize themselves with the EOP.

Critical Egress/Ingress Routes

Access to and from populated areas of the County is important for emergency response for firefighters and for residents during a catastrophic fire event. Firefighters need trouble-free access to and from subdivisions so that they may provide the most effective response for structure and life protection. Residents also need the opportunity to retreat from WUI areas in the face of wildfire.

Many populated areas throughout western Montana, including Powell County, have subdivisions with only one route of egress/ingress, roads of inadequate width, bridges of limited weight-bearing capacities, and high fire fuel loads within close proximity to the roadway. These are just some of the many situations that may compromise the protection and evacuation of WUI areas.

Though there are numerous roads in Powell County that may be compromised in the event of wildfire, of significant importance, in an area of elevated risk are US Interstate 12 between Avon and Elliston and Montana State Highway 200 from Ovando to Lincoln. Passage over portions of this highway could be compromised by wildfire, which would limit its use as a primary access route through this area of Powell County.

Fire Fighting Equipment

The fire departments in the County are equipped with numerous wildland firefighting tools and techniques. Information gathered from the fire chiefs through meetings and correspondence indicated no major wildfire fighting equipment shortages are present but did indicate that training and volunteer recruitment, and general equipment inventory is always in need of improvement. It is recommended that excessively old engines/tenders in questionable condition or equipment with outdated or with hard to find parts, must be upgraded within the next five years.

Development Requirements

Current subdivision policy regarding wildfire and fire suppression uses wording from the Powell County Wildfire Development Checklist provisions for wildfire. Refer to the Powell County Subdivision Regulations and the Powell County Zoning and Development regulations for further information.

4. Powell County Wildland-Urban Interface

Referenced WUI Methodology appendixes are contained within Appendix D. The WUI report was developed in 2019 to give a greater definition of WUI in Powell County.

Introduction

This report will lay out the process used to define the Wildland Urban Interface (WUI) map for Powell County, Montana. WUI is the area where houses meet or intermingle with undeveloped wildland vegetation. The WUI is thus a focal area for human-environment conflicts, such as the destruction of homes by wildfires, habitat fragmentation, introduction of exotic species, and biodiversity decline (Radeloff, et. al, 2005). The beginning of this process was born out of discussions at a Powell County Planning Board meeting. The Planning Board desired a tool to assist in the assessment of a new structure's wildfire risk. These discussions led to the idea that the Powell County WUI map needed to be updated. Initial research began by looking at the current Powell County WUI map. The original Powell County WUI map had been produced, according to REM Mannix the presiding county commissioner in 2019, by creating a four-mile buffer around the community centers of Racetrack, Deer Lodge, Gold Creek, Garrison, Avon, Elliston, Helmville, Ovando and Woodworth. The original Powell County WUI can be found in Appendix A as Figure 1. While structure density and population centers are an important part of WUI mapping, it is inadequate as the sole factor for designating WUI areas. The 2019 WUI Assessment Report takes into consideration additional factors such as geography, fuel sources, vegetation cover, and population centers.

The Powell County Planning Department consulted with Earl Hall (Powell County Fire Warden), Brian Collins and Elizabeth Hertz of the Montana Department of Natural Resource Conservation. Ms. Hertz has been undertaking the effort to update the WUI maps for the state of Montana and has accomplished much of the data mining process. Data and methodology was taken from the LANDFIRE.gov website, the Montana State Library and the University of Wisconsin Madison Silvis Lab websites.

LANDFIRE.gov, the Landscape Fire and Resource Management Planning Toolbox, is a shared program between the wildland fire management programs of the U.S. Department of Agriculture

Forest Service and the U.S. Department of the Interior, providing landscape scale geo-spatial products to support cross-boundary planning, management, and operations (LANDFIRE.gov, 2000). The LANDFIRE database has many of the factors that play into fire behavior as downloadable raster dataset layers. The layers that were used in the Powell County analysis were the Fuel Characteristics Classification System (FCCS), Fire Behavior Fuel Model 40 (FBFM40) and Fire Regimes. These datasets and informational connections assisted the department's effort to create a WUI and Wildfire Susceptibility Map for Powell County.

The LANDFIRE.gov website also provides access to many other layers. Due to factors such as proximity to collection stations and the desire to provide an easily replicable methodology with no requirements for high level fire behavior modeling, which is outside the capacity of the county, other factors were not considered. However, while this map is a static look at the wildfire concerns as of 2019 in Powell County, it is a current assessment that should continually be updated and improved.

Data Sources

40 Scott and Burgan Fire Behavior Fuel Model

The FBFM40 classifies vegetation to represent what the fuel capabilities are in case of a wildfire event. This dataset is concerned with the fuel's average moisture content and diameter. The original FBFM40 map for Powell County can be found in Appendix A as Figure 2.

Fuel Characteristic Classification System

The FCCS provides data on the available wildfire fuel amounts of an area in tons per acre. Heavily timbered areas return an approximate value of 300 tons per acre. The original FCCS map for Powell County can be found in Appendix A as Figure 3. Fire Regime data displays the potential for a wildfire to ignite, based off of the available vegetation, in a given number of years similar to the floodplain classification system. Fire Regimes are put into five classes based on vegetation types and a sixth class for non-flammable land covers, such as ice and open water. The original Fire Regimes map for Powell County can be found in Appendix A as Figure 4.

SILVIS Lab

The Silvis Lab at the University of Wisconsin-Madison focuses on spatial analysis and remote sensing to promote conservation and sustainability. The analysis began by using Powell County data and used the Silvis Lab metadata for their factors, methodology and end classifications. Silvis lab breaks WUI areas into classifications based on structure density, a buffering analysis that calculates the proximity to areas of 75% or greater wildland vegetation, and percentage of wildland vegetation in a set boundary. Much of Powell County fell into the low and medium density structure density categories due to the small population. Because of this, structure density was reclassified for the county, as explained below, and the official Silvis classifications were not used. Powell County did not fall within the exact category definitions used by the Silvis Lab in a way that was useful for the county and were, therefore, not used.

The first iteration WUI map for Powell County was constructed using Silvis methodology solely. The analysis process took many iterations. This initial iteration was discarded due to the lack of reasonable bounding polygons. Census blocks in Powell County do not serve to give an adequate view. The first iteration WUI map for Powell County can be found in Appendix A as Figure 5.

Silvis uses the census block as their primary boundary shape due to the availability of nationwide data. Census block polygons did not give an accurate view of Powell County due to the county's

rural landscape. Therefore, Public Land Survey System (PLSS) sections were used as the polygon unit for mapping. PLSS section data was downloaded from the Montana State Library Clearinghouse. The Montana State Library maintains GIS data for download in the Montana Spatial Data Infrastructure (MSDI). The Planning Department was not limited to Census blocks due to the department's responsibility to maintain the GIS data structures point file for the county. The structures point file is verified using aerial imagery and Powell County development certificate records and serves as the official database for addressing and emergency purposes. This enabled Powell County to bypass the constraints of only using census blocks to incorporate PLSS section boundaries. Powell County has a predominantly rural landscape and wanted to have a WUI map that would consider the entire county area not just areas of higher population.

After deciding to utilize PLSS sections, the Silvis lab was contacted for assistance. David Helmers is the lead on the Silvis lab's nation-wide WUI mapping efforts and has worked in the Silvis lab since 2008. He stated that their classifications of structure densities were taken from federal standards described in the U.S. Census. Mr. Helmers also explained the other factors: Wildland Vegetation Percentages and the Buffer Criteria.

Wildland Vegetation

Wildland Vegetation Percentage was identified through use of land cover classifications taken from the Montana Land Cover Framework found in the MSDI. The state of Montana last updated their land cover database in 2016. This database is made up of attributes that describe data in different levels of detail ranging from large ecological groups to individual species types.

The original Land Cover Level 1 map for Powell County can be found in Appendix A as Figure 6. To calculate the Wildland Vegetation Percentage per PLSS section in Powell County, the Level 1 Land Cover classes were converted from a raster to a polygon using the *Raster to Polygon Tool* in ArcPro. *Select by Attribute Function* was then used to select the fields that were considered wildland vegetation based on the Silvis definitions. A new layer was created from this selection. Then the *Intersect Tool* was run between the PLSS Section shapefile and the Wildland Vegetation shapefile that had just been created. The *Split Tool* was run using the FIRSTID attribute as the unique field name. The *Merge Tool* was then used to combine the *Split Tool* output. *Calculate Geometry Function* was used to find the area of wildland vegetation for each parcel after being split. Then a *Field Join Function* was performed to each PLSS section in Powell County to combine the newly created Wildland Vegetation Percentage shapefile to each PLSS section. A new field was added to the PLSS Sections attribute table and the *Calculate Geometry Function* was used to find the area (km^2) of each PLSS section. Then, using *Field Calculator Function* the percentage of area of each PLSS section was calculated by taking the area of the Wildland Vegetation intersect file divided by the total area of each PLSS section. This gave a decimal number that was converted to whole numbers by multiplying by 100. The *Int Function* in *Field Calculator Function* was used to convert the percentages into values that could be converted to a raster. To get the data back to usable format for end analysis *the Polygon to Raster Tool* was used. The newly created Percent of Wildland Vegetation shapefile was converted to raster and the value field was set to the percent of wildland vegetation per PLSS section.

Level 2 Land Classifications

Level 2 Land Cover classifications break down land cover into more detailed classes. This data is an attribute within the Montana Land Cover raster dataset. This data was used in the analysis to provide a more in-depth description of Powell County. The original Land Cover Level 2 map for Powell County can be found in Appendix A as Figure 7.

Buffer

The Silvis lab methodology also included a buffer in their analysis. The buffer was looking to identify any area that is within 2.414 kilometer (1.5 miles) of an area that has 75% or higher wildland vegetation cover. If an area fell within the buffer it was deemed at a higher risk than an area that was less than 75% wildland vegetation cover. Using PLSS sections as the polygon boundary area, this buffer analysis was conducted with Powell County data. The buffering analysis showed that there are no PLSS sections within Powell County that are not within the buffer criteria. Therefore, this factor was not included in the Powell County analysis. When speaking with Mr. Helmers about this fact he stated that most of the western portion of the United States is within the buffer criteria.

Aspect and Slope

Aspect and Slope layers were created in ArcMap Desktop using preloaded geoprocessing tools. A digital elevation model layer, which was downloaded from the MSDI, was used as the input dataset to create the Slope and Aspect layers. These are important factors when considering the spread of wildfires. The original Slope and Aspect maps for Powell County can be found in Appendix A as Figure 8 for Slope and Figure 9 for Aspect.

Structure Density

Structure Density was calculated as structures per km^2; the same methodology that the United States Census Bureau uses. The official Powell County structures point shapefile was used to calculate the structure density per PLSS section. The area in km^2 per PLSS section was calculated using the *Calculate Geometry Function* within the attribute table. Then a *Spatial Join Function* was done between the Structures and PLSS Section shapefiles using WITHIN as the criteria for selection. This method is consistent with the recommended methods by ESRI. The join count field, which summarizes how many point features (structures) are within the polygon features (PLSS sections), was then divided by the PLSS section's area. This calculation gave the structure density per km^2 for each PLSS section within Powell County.

The classifications for structure density were adjusted to fit the local Powell County dataset and therefore do not match the federal classifications. This alteration in the classifications was done due to the rural nature of Powell County. Outside of the city of Deer Lodge, there are no areas in Powell County that classify as anything other than very low or low structure density as classified by the Census Bureau. The Powell County structures map can be found in Appendix A as Figure 10.

These layers were selected due to their attribute data being the most recently updated on LANDFIRE's site. Datasets were also selected because the data was in a user-friendly format. Some datasets were excluded from the analysis due to the need for complex fire modeling, that requires unattainable resources. Factors were also excluded from the analysis due to datasets being out of date or not applicable for the county's desired outcome analysis.

Factors that were included in the final analysis were selected due to their understood effects on wildfire behavior, the most recently updated datasets, the data was in a usable format and the data was either maintained by the Powell County Planning Department or other reliable entities.

Data Reclassifications & Zonal Statistics

This chapter will describe the process that was used to get the raw data that was detailed above into classes and forms that could be used for final analysis. The chapter will give a breakdown of how data was converted, why it was converted, and the reasoning behind the classification and reclassification methods used. All processes were completed in ESRI ArcMap or ArcPro formats using preloaded geoprocessing tools. No new Python scripts were written, and tools were run in a step-by-step iterative process and were not entered into a model at the time of this report. Geoprocessing tools that were used include: Reclassify, Zonal Statistics, Polygon to Raster, Spatial Join, and Raster to Polygon. Attribute functions used in analysis process: Calculate Geometry, Join Field, and the Field Calculator.

As stated previously, the use of census blocks did not allow for an accurate analysis of Powell County and PLSS sections were used as the primary mapping polygon boundary. The PLSS sections of Powell County can be seen in Appendix A as Figure 11. Each of the data factors listed above were reclassified and split by section for the final analysis. Definitions of classes and attributes can be found in Appendix B. All reclassification tables can be found in Appendix C. Data factors were reclassified so that lower scores would be considered areas of lower risk to wildland fires.

Each LANDFIRE data set was downloaded as a raster dataset. The LANDFIRE toolbar extension in ESRI ArcMap was used to draw a selection rectangle around Powell County to download data. Raster datasets were then clipped to the official Public Safety Answering Point county boundary for Powell County that is maintained by the Montana State Library MSDI. This process was repeated for all LANDFIRE datasets (FCCS, FBFM40, & Fire Regimes).

40 Scott and Burgan Fire Behavior Fuel Model

Definition for the layer as provided by the LANDFIRE website “40 Scott and Burgan Fire Behavior Fuel Model (FBFM40) represents distinct distributions of fuel loading found among surface fuel components (live and dead), size classes, and fuel types” (LANDFIRE.gov, 2014). This dataset contains previously classified data and for the purposes of the Powell County analysis the reclassification mirrored the original models. After reclassification the *Zonal Statistics Tool* was used to split the data to the section boundaries. The *Zonal Statistics Tool* requires that the method for data summarization be chosen. For this analysis the functions of MEAN, MAJORITY and MAXIMIUM were chosen.

• MEAN—Calculates the average of all cells in the value raster that belong to the same zone as the output cell.
• MAJORITY—Determines the value that occurs most often of all cells in the value raster that belong to the same zone as the output cell.
• MAXIMUM—Determines the largest value of all cells in the value raster that belong to the same zone as the output cell.-(ESRI Tool Help Function, 2019)

For FBFM40, it was decided that a MAJORITY summary was the most applicable. The MAJORITY function was chosen for this dataset because it is comprised of a reclassified pre-existing range dataset. The classification break down with definitions can be found in Appendix B as Table 1. The reclassification methodology for the Fire Behavior Fuel Model can be found in Appendix C as Table 1c. The *Reclassify* and *Zonal Statistics Tools* output map of FBFM40 can be found in Appendix D as Figure 12.

Fuel Characteristics Classification System

For the FCCS data the attribute that was selected was the total above ground attribute in the data set. This attribute details the tons per acre of wildland fuel that is above ground and includes tree canopies as well. This dataset was not reclassified and was added to the model as raw numbers. The MAXIMUM function was chosen for this dataset due to the dataset maintaining its discrete data. This allowed the analysis to be run without being affected by areas of extreme low outliers. Areas such as a mountain top, cliff or areas regularly covered by snow and ice. They record a value of 0 while forested areas returned a much higher value-in the hundreds. MAXIMUM was chosen to limit the effect of areas that were predominantly forested with mountain peaks or an ice sheet contained within the section. The MAXIMUM function and not the MAJORITY function were chosen because the FCCS dataset was not reclassified and its data represent a discrete point and not a range. When planning for large disasters such as a wildfire, it is best to prepare for the worst scenario so that response units are as highly efficient as possible. The Zonal Statistics Tool output map of FCCS can be found in Appendix D as Figure 13.

Fire Regimes

Fire Regimes were reclassified to reflect the frequency potential for a fire. Fire Regimes were reclassified to a numeric value for end use analysis. All nonflammable areas were reclassified as class 1. The reclassification table can be found in Appendix C as Table 2c. This data was summarized using a MAJORITY function within the *Zonal Statistics Tool*. The MAJORITY function was chosen for Fire Regimes, like the example given above in the FCCS explanation. An area that is predominantly timber with just a small section of barren rock would be coded to the timber's Fire Regime because timber is the majority regime in that section. Fire
Regime data was classified off of a range dataset and not discrete data therefore, the MEAN function was not chosen. Using the MAJORITY function makes *Zonal Statistics Tool* pick from the reclassification values. This allows for cross referencing with the areas original Fire Regime classification. Fire Regime definitions can be found in Appendix B as Table 2. The *Reclassify* and *Zonal Statistics Tool* output map of Fire Regimes can be found in Appendix D as Figure 14.

Wildland Vegetation

Land Cover Level 1 data were reclassified as either wildland vegetation or areas of low wildfire fuel using Silvis definitions. The classification breakdown with definitions can be found in Appendix B as Table 3. Silvis defines wildland vegetation as any Level 1 area that is categorized as timber, shrubland or grassland. From the Silvis definition Level 1 categories of Shrubland, Steppe and Savannah Systems, Grassland Systems, Forest and Woodland Systems and Alpine Systems were considered wildland vegetation areas. The reclassification table can be found in Appendix C as Table 3c. A map of wildland vegetation areas can be found in Appendix D as Figure 15. This data was summarized using a MAJORITY function within the *Zonal Statistics Tool*. The use of MAJORITY also allows for cross referencing with the reclassified and original datasets to see how the area was originally coded.

Level 2 Land Classifications

Land cover Level 2 classifications were used due to concerns over the recently modified or disturbed Level 1 classifications. The definitions for the classifications were too vague to provide a reliable assessment for Powell County. Level 2 classifications take the Level 1 classes and split them into more detailed classes. The definitions of the land classes can be found in Appendix B as Table 4. These classifications were placed into 3 categories: Low, Medium, and High-risk areas. This classification was done by Dr. Scott Powell, professor of Environmental

Spatial Analysis at Montana State University. Dr. Powell stated that classifying these systems was a somewhat subjective process, but with using a three-level reclassification he felt content with this ranking. These attributes were reclassified to numeric values based off Dr. Powell's recommendation. The reclassification table can be found in Appendix C as Table 4c. The *Reclassify* and *Zonal Statistics Tools* output map of Level 2 Land Classifications can be found in Appendix D as Figure 16.

Slope

The slope dataset was split using zonal statistics before being reclassified. This decision was made to have the MEAN tool run as the summary statistic in the *Zonal Statistics Tool* because the mean slope per section at this stage was still a discrete dataset. This choice eliminated the weighting of outliers such as cliff faces with extreme slopes. Upon completing the zonal statistics analysis slope data was reclassified using the National Fire Danger Risk, a United States Forest Service (USFS), published classification system. These values can be viewed in Appendix C as Table 5c. The *Reclassify* and *Zonal Statistics Tools* output map of slope data can be found in Appendix D as Figure 17.

Aspect

The aspect dataset was reclassified to match the directional nature of the slopes. Using information from the Idahofire.org, a USFS wildfire prevention partner, website, aspects were ranked in Powell County. The reclassification table can be found in Appendix C as Table 6c. Then after coding the directions based on the USFS ranking information the dataset was summarized using a MAJORITY function within the *Zonal Statistics Tool*. The *Reclassify* and *Zonal Statistics Tools* output map of aspect data can be found in Appendix D as Figure 18.

Structure Density

Structure density was calculated using the official Powell County 911 structure file. This file is maintained by Powell County for emergency purposes and is regularly updated. Structure density was calculated on a structures per km^2 unit to match the US Census Bureau methodology. The Census Bureau calculates structure density within Census blocks as the bounding geometry, whereas the analysis done in Powell County used PLSS sections. Structure density was not classified using US Census Bureau classes because the only sections that classified above a low population density were the sections that make up the city of Deer Lodge. Structure density was reclassified using an equal interval method with five classes. The reclassification table with values can be found in Appendix C as Table 7c. The *Reclassify* and *Zonal Statistics Tools* output map of population density can be found in Appendix D as Figure 19.

Final Analysis and Adoption Process

The end maps were created using the *Weighted Sum Tool* on the ArcMap software. Each factor was given a weighting of 1 as advised by Mr. Helmers of the Silvis lab. He stated that trying to decide a weighting class for wildfire factors is not feasible due to the high level of differences between which factors are more influential on wildfire susceptibility on any given day. To create the final maps for Powell County, two versions were created. These maps will inform the viewer of an area's wildfire risk. The WUI map based off Silvis classifications uses the lab's methodology and only considers three factors. The "Wildfire Susceptibility Map" considers more factors that influence a fires behavior. Both maps can give an assessment of an area's wildfire risk. Powell County contains many large areas of low structure density so it became necessary to broaden the factors the methodology considers. Two maps were created due to the need to look at factors outside of traditional WUI

methods. Traditional WUI maps are looking to assess areas of human centric risk from wildfires. Many of Powell County's assets are large ranching areas. If these areas were to severely burn it would be incredibly detrimental to the ranchers, one of the largest industries in Powell County. Powell County wanted to understand the total wildfire risk for the region and chose to include more factors into the analysis. This was done in an effort to reduce the impact that population centers had on the end analysis and give a rural county the ability to assess its true wildfire risk.

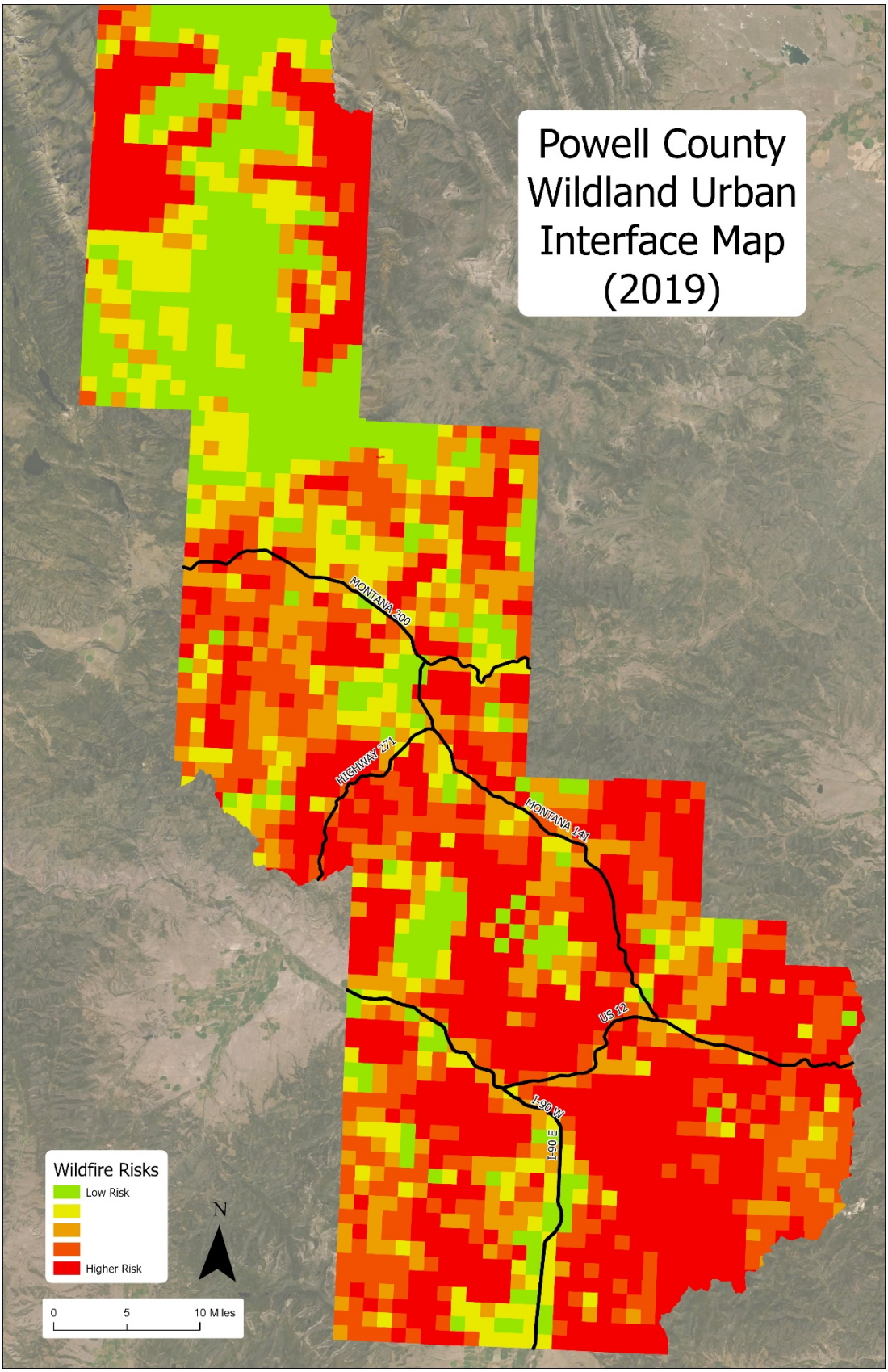
The first map, the "Wildland Urban Interface Map for Powell County, Montana", was based solely on the Silvis lab classification system and traditional WUI factors. The criteria that was used in this map were wildland vegetation percentage, structure density and the Level 2 land classifications from Dr. Powell. The buffer factor was not included in this analysis. The other map, the "Wildfire Susceptibility Map", encompassed many more factors. These factors were: FCCS, Fire Behavior Fuel Modeling, Fire Regimes, Slope, Aspect, Structure Density, & Wildland Vegetation Percentage. The output maps of the *Weighted Sum Tool* can be found in Appendix E as Figure 20 (Wildland Urban Interface Map for Powell County, Montana) and Figure 21 (Fire Susceptibility Map).

The "Wildland Urban Interface Map for Powell County, Montana" and the "Wildfire Susceptibility Map" should be used to assess an area's wildfire risk. These maps are a tool and should be used in conjunction with local knowledge and current conditions. Each layer created and the raw data used are maintained within the Powell County Planning Department servers. The classified data and the "Wildland Urban Interface Map for Powell County, Montana" and the "Wildfire Susceptibility Map" that were created are stored on the Powell County Organizational ESRI ArcOnline. These maps are maintained for the fire warden and the public to use for the assessment of an area's wildfire risk.

The maps represent an assessment of the current level of wildfire susceptibility for Powell County as of April, 2019. These maps provide a static representation of the county with the most current data available to the Powell County Planning Department. For future use, these maps should be updated incorporating the most recent data available to the county. A full data dictionary with the date of creation of the original datasets can be found in Appendix C, Table 8c. Any data evaluations regarding forest ecology or fire behavior was decided by consulting an expert and research from credible sources. For a list of the experts consulted, and their contribution see Appendix D, Table 9c.

This methodology was reviewed by Patrick Moody (Powell County Attorney Office), Earl Hall (Powell County Fire Warden), Kimiko Barret (Headwaters Economics), Carl Hamming (Powell County Planning Director), Ann O'Toole (Powell County Planning Department), and Scott Hazelton (Powell County Planning Department).

For further questions regarding this process, please contact the Powell County Planning Department:
409 Missouri Avenue
Suite 114
Deer Lodge, Montana 59722
Phone number: (406)-846-9795


Powell County
Wildland Urban
Interface Map
(2019)
MONTANA 200
HIGHWAY 271
MONTANA 141
US 12
I-90 W
I-90 E
Wildfire Risks
Low Risk
Higher Risk
N
0
5
10 Miles

5. Planned and Completed Mitigation Activities

Powell County has been proactive in its effort to reduce the size and frequency of fires in its WUI area. Through the efforts of the BLM, Forest Service, NRCS, DNRC, County Fire Warden, Blackfoot Challenge and many others, several fire reduction projects have been planned and many successfully implemented on hundreds of acres of private, state, and federally owned/managed land have been treated to reduce fire hazard throughout Powell County. The west central portion of the County is also covered under the 2008 Blackfoot/Clearwater Fuels Mitigation Plan. This higher detail plan was prepared by the Ecosystem Management Research Institute (EMRI) in collaboration between Missoula, Powell and Lewis and Clark Counties under direction of the Blackfoot Challenge. The plan targets detailed fuel hazard conditions to a sub-watershed level.

A statement of Powell County's commitment to WUI fire hazard reduction is the current County policy that requires new subdivision developments to adhere to the Montana Model Subdivision requirements for high fire hazard areas.

Past effort to quantify WUI risk/hazard issues transpired in 2005 with the development of the County's CWPP. The CWPP updates aims to mesh into currently functioning programs. Previously planned WUI mitigation activities in Powell County should be fulfilled and effective mitigation efforts or strategies continued while the CWPP is implemented.

6. Implementation, Monitoring, and Review

This section outlines recommendations for the implementation, monitoring, and review of mitigation activities outlined in the CWPP. These recommendations are intended to provide a starting point for the County to build upon. Revisions in the Plan should accommodate changing wildland conditions, new technologies, and evolving priorities within the County.

Implementation of on-ground action should be strategic and completed using the FMPR system with one or many of the prescribed activities in the following section of the CWPP.

CWPP management direction will be applied through a dual process of plan implementation and monitoring. Implementation is the responsibility of local government through a designated WUI coordinator, to be developed, to employ the CWPP strategies on priority land areas. The County as a whole has an ongoing responsibility in monitoring how effectively the government is implementing the plan and whether the stated management intent is being achieved. Through ongoing feedback, the implementation of the Plan can be adapted to increase its overall effectiveness.

Implementation

Successfully mitigating WUI wildfire risk and improving structure fire survivability/defense in Powell County is a collaborative process that should be multi-jurisdictional. Strategies discussed in this section will detail the types of activities that can be implemented to mitigate the risk of negative wildfire impact on WUI structures and values. Implementation of the CWPP risk reduction strategy can occur through a number of processes:

- Incremental mitigation activities implemented as specific CWPP projects

- More detailed plans, such as watershed wildfire plans, subdivision wildfire plans
- Subdivision development requirements
- County wildfire safety codes

Further higher detail planning will be necessary before on-ground mitigation action can occur. The creation of a WUI Coordinator or equivalent designate is recommended and should be developed for the County. This individual would serve to coordinate activities and ensure the expectation of the CWPP is met.

Wildland-Urban Interface Fire Hazard Mitigation

WUI protection and fire hazard reduction may be accomplished using different. Six general strategies to hazard reduction and risk mitigation are ranked from high to low priority below. The highest priority is assigned to strategies that result in the greatest reduction of WUI fire hazard with the least amount of time.

Table 2: Mitigation Strategies

Strategy	Priority	Activity Description
Fuels Management	1	• Continue/complete current mitigation activities. Initial focus will be on defensible space then rem oval of commercial value wood, pre-commercial thinning, prescribed burning, stream restoration, and weed control that promote the reduction of fire hazard. • Support new hazardous fuels treatment projects within the wildland urban interface and promote Firewise™ principles. • Encourage private landowners and agencies to address forest health issues and mitigate fire risk. • Encourage the development of subdivision level wildfire assessment and maintain current planning standards. • Reduce fuel hazard/WUI risk in the Avon to Elliston MT HWY 12 & HWY 200 corridor where necessary.
Education/ Prevention	2	• Introduce/maintain wildfire prevention education and training in the form of public school instruction and media outreach program s. • Expand County outreach or extension program s developed by federal and state agencies. • Design/conduct WUI residence hazard assessments in coordination with federal and state outreach program s. • Promote subdivision wildfire evacuation planning.
Planning	3	• Assign/Develop a WUI Coordinator designate by contract or from present public servants. • Improve road access in constrained areas of the W UI. • Install/improve dry hydrants in identified priority locations. • Assess and improve bridge capacities in the W UI. • Update fire department equipment resource inventories. • Update/initiate W UI structure mapping.
Development	4	• Establish guidelines possibly in the form of minimum codes for new structures and subdivision areas to ensure fire safe • characteristics (such as the NFPA 1144 standard) and/or implement FireWise™ standards. • Consider assessing WUI residences as part of a real estate transfer program.
Training	5	• Improve cross-training of firefighters who suppress forest and structure fires.

Inter-agency Cooperation	6	• Review, improve and revise mutual aid agreements between VFDs, municipal FDs, state, federal, and private firefighting resources where necessary.

Fuels management, a direct strategy, is assigned the highest priority. The five other strategies, indirect mitigation strategies, will lead to changes in policy and attitudes and ultimately result in the reduction of wildfire hazard and risk exposure. **Table 2** also describes activities that can be completed under each of the mitigation strategies.

Fuels mitigation activities are complex and numerous and should be tailored to terrain, habitat type and condition, ecology, or social situation. The following is a non-exhaustive list of activities that may be employed for direct fuels mitigation:

- Commercial and non-commercial timber thinning (including selective and group thinning)
- Pruning
- Under burning
- Creating shaded fuel breaks
- Mulching and chipping
- Grazing
- Brush/grass mowing
- Weed treatment

Combinations of activities, techniques, and tools used under the appropriate conditions as guided by the CWPP will reduce the identified fire hazard and risk exposure in an ecologically, environmentally, and socially responsible manner.

Structure Ignition and Fire-Risk Reduction

Much of the previous section addressed the mitigation of wildfire risk and/or impact of wildfire on the greater landscape beyond the individual structures in the WUI. This section builds on the landscape level mitigation strategy by making wildfire risk reduction recommendations that can be applied to individual structures and the area directly surrounding those structures. In the event of a major WUI fire involving numerous buildings, firefighters will likely prioritize the protection of homes and buildings based on ease of protection. Many of the strategies mentioned previously may also be used to reduce the risk of a potential loss of structure or to increase firefighter safety while engaging fire in the interface. Powell County Provides the Wildfire Checklist when development is expected and the document is available on the County's website for further information.

Timeline

CWPP mitigation actions will be implemented according to a time schedule addressing very high- and high-risk areas first.

CWPP-authorized fuels mitigation action by state and federal land management agencies on public land to reduce fuel hazard will place considerable justification on the FMPR system in determining priority land areas. State and federal agency activity planning on public land will meet Montana Environmental Planning Act (MEPA) and National Environmental Planning Act

(NEPA) policy, respectively, including public announcements and scoping documents the agencies use to develop mitigation projects.

Fire mitigation projects on private land follow a similar system of prioritization as outlined for state and federal projects. Private non-industrial forest WUI landowners who want to reduce the risk of loss to wildfire are directed to work with the Planning Department, DNRC Service Foresters, Blackfoot Challenge, NRCS district conservationist, or approved private contractor to generate a fire risk rating for their proposed project area and develop a fuels mitigation plan. The County Planner, or equivalent designate, will use site-specific scores on private properties to develop an unbiased ranking of site fire risk for allocating assistance.

Higher Detail Plans

As part of implementation, it will likely be necessary to refine the broad, strategic guidance and risk ratings in the CWPP and develop specific project level plans. Some of these detailed wildfire protection and project plans may include watershed level plans, subdivision plans, other managed area wildfire plans, and future local development plans to address area-specific fire issues.

In all cases, it is expected that the detailed planning initiatives and the resulting products will be guided by and be consistent with the intent of the CWPP. Where more detailed planning reveals new information, a minor revision or amendment to the CWPP may be warranted, in accordance with the criteria outlined in the Minor Revision section that follows.

7. Roles and Responsibilities

A number of different players are involved in implementation and monitoring of the CWPP. The roles and responsibilities of the various participants in the process are as follows:

Local Government

The County Commissioners will be kept informed about the implementation of the CWPP and are encouraged to participate in the implementation, ongoing monitoring, and review of the plan.

Federal and State Agencies

Government agencies are the primary vehicles for the implementation of the CWPP. Implementation is achieved through the ongoing delivery of government programs, policies and initiatives as well as agency application of prescribed fire mitigation activities on public land. The relevant agencies will:

- Carry out responsibilities under the plan;
- Prepare a Tactical Plan detailing tasks arising from CWPP objectives and strategies, including defining priorities for implementation and more detailed planning;
- Provide the CWPP document to resource agency staff, stakeholders, and interested public;
- Initiate, review and/or provide technical recommendations on proposed revisions and amendments to the plan.

Public
It is recognized that members of the public, in general, are important contributors to the effective implementation and monitoring of the CWPP in partnership with the local government, and the different government agencies. The nature and level of public involvement in more detailed planning will be determined in response to emerging issues, stakeholder interests, and agency resources.

8. Monitoring
The monitoring phase of the CWPP involves ongoing assessment of how well the primary purpose of the CWPP is being implemented. The public has an important role to play in monitoring and providing feedback for the CWPP.

There are two aspects to plan monitoring:

1. An assessment of CWPP implementation through agency projects and programs; and
2. The effectiveness of plan implementation in achieving the management intent of the plan.

If the desired outcomes of the CWPP are not being achieved, it may be necessary to consider revisions to the plan.

Adaptive Management
The risk assessment, mitigation prioritization, and implementation plan in the Powell County CWPP has been developed using the best information and knowledge available at this time. The CWPP endorses a process of adaptive management, in which implemented activities are monitored for effectiveness and changes are enacted when and where required. The use of an adaptive management monitoring strategy will allow continual improvement of management policies and practices. By monitoring key response indicators over time and incorporating new information and knowledge, the local government, and agencies will be able to analyze the outcome of their fire mitigation activity in light of the original CWPP intent and incorporate those results into future planning and approach to best practices in the WUI.

9. Plan Amendments
Proposed revisions to the Plan as identified by the CWPP Monitoring Committee, agencies, or through more detailed planning will be identified. The Planning Department will review and approve minor revisions to the plan, but major amendments will need to be approved by the principal stakeholders.

Minor Revisions
The Monitoring Committee will make recommendations for minor revisions to the plan to the Planning Department. With Planning Department approval, minor revisions will have documented in the annual monitoring report. Examples of minor revisions include but are not limited to:

- Revised priorities for implementation;
- Refinements to objectives and strategies as suggested by higher plans; and
- Plan changes required to conform to new laws and regulations.

Major Revisions

A major revision to the Plan will be referred to as an amendment. The following are considered amendments to the plan:

- Major revisions to intent or prescribed mitigation activities;
- Changes to the WUI definition and boundaries; or
- Changes to WUI value priority zone boundaries.

Although the CWPP Monitoring Committee does not have the mandate to make land use planning decisions, it can make recommendations for revisions or amendments to the plan.

10. Plan Review

The Powell County CWPP is subject to a minor review yearly and a comprehensive review to commence in the 9th year of the plan and be completed by the 10th year. This update was reviewed by the Montana Department of Natural Resources, the Powell County Fire Warden, Powell County Fire Chiefs, the Powell County Commissioners and concerned stakeholders of Powell County.

Interpretation

From time to time, the public, local government, or agencies may become concerned about how the plan is being interpreted or about specific land and resource practices. In all instances of concern, the issues will be dealt with in a cooperative manner.

Interpretation of Priorities, Activities, and Strategies

The priorities, strategies, and activities in this CWPP should be interpreted at a broad or strategic level wherever possible. Where a concern is raised over the interpretation and/or implementation of priorities, strategies, or activities the concern should be addressed directly to the affected agency or the Planning Department. The agency or the Planning Department will respond to the concern in writing, consulting with the Powell County Commissioners for guidance where necessary.

11. Assistance Programs

Assistance is available from the federal and state government to non-industrial private landowners, landowner cooperatives, tribes, fire departments, state land managers, and state, city and county government. As these assistance programs change regularly it is best to check with Federal and State organizations that deal with fires and natural resources.

12. Active Stakeholders and Plan Development

The Powell County CWPP generation process has included the participation of many community entities. Generation of this plan has included the following primary stakeholders:

- Commissioners
- Disaster and Emergency Services
- Planning Department
- Fire Chiefs
- Fire Warden

- Montana Department of Natural Resources and Conservation

The Planning Department asked for discussions with and received feedback from the public, private organizations, and federal, state, and local agencies to identify wildfire risks, priority areas, priority projects, and mitigation activities. Input from public stakeholder groups was additionally encouraged through public notices published in local newspapers (Appendix A).

In mid-March 2021 a 1st Final Draft CWPP was circulated to core stakeholders for review and comment. In early-April 2021, after recommended changes were received and incorporated from stakeholders, a completed final version of the CWPP was posted via the Powell County website. Notification of the internet posting was issued through public notice.

13. References

Cohen, J. D., & Deeming, J. E. (1985). *The national fire-danger rating system: Basic equations*(United States, Forest Service). U.S. Dept. of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station.

ESRI. (2016). Help. Retrieved from http://desktop.arcgis.com/en/arcmap/10.3/tools/spatial-analyst-toolbox/h-how-zonal-statistics-works.htm

Idaho Fire Inc. (n.d.). Wildfire ignition, behavior and effects. Retrieved from http://idahofirewise.org/fire-ecology-and-management/wildfire-ignition-behavior-and-effects/

Montana Heritage Program, (2019). Montana Field Guide. Retrieved from https://mslservices.mt.gov/Geographic_Information/Data/DataList/datalist_MetadataDetail.aspx?did={ef50a002-8d09-4d17-8d14-9dfbff3aa93f}

Radeloff V. C., Hammer R. B., Stewart S. I. , Fried J. S., Holcomb S. S., And McKeefry J. F., (2005) The Wildland–Urban Interface In The United States, *Ecological Applications*, 15(3), Pp. 799–805, https://www.nrs.fs.fed.us/pubs/jrnl/2005/nc_2005_radeloff_001.pdf

United States Department of Agriculture., & United States Department of the Interior. (2000). About LANDFIRE. Retrieved from https://www.landfire.gov/about.php

United States Department of Agriculture., & United States Department of the Interior. (2010). Fire Regimes. Retrieved from https://www.landfire.gov/DataDictionary/frg.pdf

United States Department of Agriculture., & United States Department of the Interior. (2014). 40 Scott and Burgan Fire Behavior Fuel Models. Retrieved from https://www.landfire.gov/fbfm40.php