

# WILDFIRE MITIGATION PLAN

2022



Your Touchstone Energy® Cooperative 

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## Executive Summary

### *Objective*

United Power is committed to delivering safe, reliable, and cost-effective electric service to its members. This plan details the recommended response to the increasing threat of a wildfire and what actions are being taken to minimize risk. Though many elements of this plan focus attention on United Power's infrastructure and the effort to reduce fire ignitions, our primary objective is safety; to protect lives and property by reducing the risk of a utility involved wildfire.

The base of this Plan is mitigation of risk, resulting in a series of recommendations to:

- Protect United Power's Electric Infrastructure
- System Hardening and Improvements
- Enhance Vegetation Management
- Community Outreach and Emergency Response to Wildfires

### *Background*

In 2021, United Power updated the Wildfire Mitigation Plan, formally assembled in 2019. Our Plan reflects the Company's 80+ years' operating history combined with recent efforts to quantify safety, financial, and service reliability risks related to wildfires. Risks are not stagnant, and this plan will evolve over time to align with environmental, political, financial, and other factors that influence those risks.

### *Increase in Wildfire Activity*

In 2020, Colorado experienced three of the largest most destructive wildfires in state history – The Cameron Peak, East Troublesome, and Pine Gulch fires. A total of 6,761 fires were reported on all lands and burned a total of 744,120 acres.<sup>1</sup>

The Marshall Fire which started December 30, 2021, in Boulder County Grasslands is now considered the most destructive fire in state history. A total of 1,084 residential structures and 7 commercial structures were destroyed. Additionally, 149 residential structures and 30 commercial structures were damaged. Total of 6,026 acres burned and current estimated damage to residential property is over \$513 Million.

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<sup>1</sup> Colorado Division of Fire Prevention & Control

Climate conditions, drought, declining forest health and an increasing number of homes in the Wildland Urban Interface (WUI) areas have elevated wildland fires. The WUI describes areas where human structures and/or improvements intermingle with undeveloped wildland or vegetative fuels. Population growth within WUI increases wildfire risk substantially. The frequency and size of wildfires combined with development in fire prone areas is projected to make wildfires one of the most significant environmental threats in the western United States.

### *Power Shutoff*

A few neighboring State utilities have opted to ‘Public Safety Power Shutoffs’ based on weather and fire conditions. United Power is committed to providing safe and reliable electric service. Currently, we are not looking at Public Safety Power Shutoffs as an option for mitigating risk. However, we will continue to evaluate this option with our Board of Directors on an annual basis.

We have installed a specific type of relay which will detect a ‘high impedance fault’ on our reclosers at Crescent, Lincoln Hills, and Ralston Creek Substations. A recloser is a high voltage electric switch, like a household circuit breaker, that shuts off electric power when trouble occurs. A household circuit breaker remains shut off until it is manually reset. A recloser automatically tests the electrical line to determine whether the trouble has been removed. As an example, if a tree momentarily contacts the overhead electric line a recloser will ‘open or trip’ and then automatically ‘close’. If the tree is no longer in the line, a recloser will remain closed and energized. The automated reclosing can reduce outages and/or isolate the electric line if an issue occurs. Benefits of this special relay will be discussed in this plan.

### *Red Flag Warning Day*

National Weather Service will issue a Red Flag Warning when warm temperatures, low humidity, and strong winds are expected. When combined, these conditions produce an increased risk of fire danger.

When a Red Flag Warning impacts our service territory, United Power will adjust system settings and operating procedures. What this means; if a tree or foreign object contacts a power line, our substation recloser will open automatically and remain de-energized until the power line has been patrolled by United Power field personnel. If no cause is found and no hazard has been reported, our field personnel and system operator will close the substation recloser to restore power. After power has been restored, our field personnel will patrol the power line a second time to check infrastructure and field devices. Our second patrol may identify an issue and prevent another outage.

## Wildfire Mitigation Plan Goals

### *Objective*

This plan details United Power's response to the increasing threat of wildfires to our electric system and our commitment to provide safe, reliable electric service to members. The plan will be reviewed and updated annually to ensure it is consistent with industry best practices and standards.

### *Goals of the Wildfire Mitigation Plan*

- **Emergency Preparedness** – To recognize wildfire as a recurring threat to infrastructure, the communities we serve, employees and members.
- **Promote Public & Employee Safety** – To protect physical assets, property, and human lives against the danger of wildfires. Identify fire potential as a manageable risk element of United Power's operating and maintenance plans.
- **Financial Protection** – To mitigate the likelihood and aftermath of financial costs and potential liability associated with wildland fires.

# Risk Assessment

## Wildfire Risk Framework

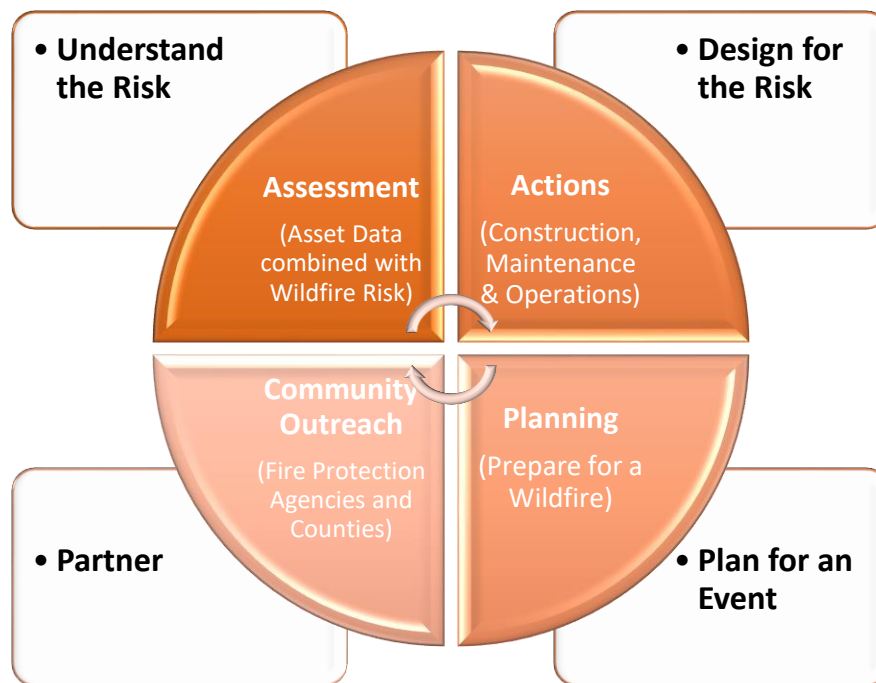
Actions recommended in this Plan are based on United Power’s Risk Analysis and Asset Management approach. Risk analysis establishes a guide for identifying, quantifying, and adopting recommendations.

**Understand the Risk** – Combining infrastructure data with wildfire risk, suppression difficulty and WUI to yield a ‘risk potential’ metric.

**Design for the Risk** – Alter Sub-Transmission and distribution materials and construction to minimize the potential for utility involved fire ignition.

**Plan for an Event** – Prepare field and office personnel through planning, training, and simulation exercises.

**Community Outreach** – Collaborate with Counties and Fire Protection Agencies regarding wildfire mitigation plans. Educate members regarding safe vegetation to reduce surface fuels and tree contact with powerlines.



## Risk Assessment Methodology

This plan is based on the ability to reduce operating and financial risks of a wildfire. Understanding how to quantify risk is essential to understanding the content of this report. The methodology for categorizing risk is calculated by combining infrastructure data, wildfire risk, WUI, and suppression difficulty.

The information below was collected from Colorado State Forest Service and is specific to our Mountain District.

**Wildfire Risk:** The overall composite risk occurring from a wildfire derived by combining Burn Probability and Values at Risk Rating.

**Burn Probability:** Annual probability of any location burning due to wildfire.

**Values at Risk Rating:** A composite rating of values and assets that would be adversely impacted from a wildfire by combining four main risk outputs – Wildland Urban Interface, Forest Assets, Riparian Assets and Drinking Water Importance Areas (watersheds).

**Suppression Difficulty Rating:** Reflects the difficulty or relative cost to suppress a fire given the terrain and vegetation conditions that may impact machine operability.

## Infrastructure Data

United Power provides electric service to over 5,500 meters in our Mountain District. The table below is infrastructure data for sub-transmission and distribution assets.<sup>2</sup>

Asset Classification	Asset Description
Substation Assets	Assets include Station transformers, protective devices, voltage regulators, capacitors, structures, relays, switchgear, and control houses.
Sub-Transmission Line Assets	Assets include conductor, structures, and switches operating at 69kV and 34.5kV.
Distribution Line Assets	Assets include overhead conductor, underground conductor, structures, fiber optic cable, transformers, voltage regulators, capacitors, switches, line protective devices, meters, and streetlights.

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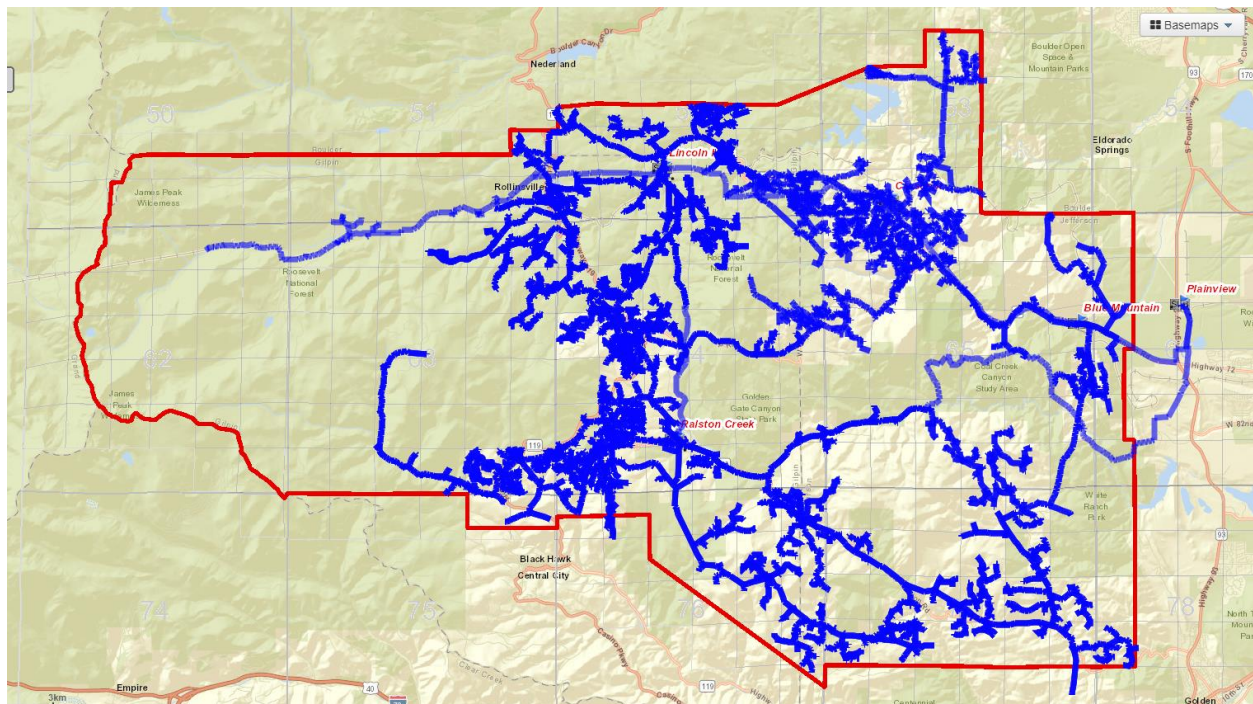
<sup>2</sup> Infrastructure Data from 2021

## Mountain District Infrastructure Data

Asset	Miles of Conductor	Miles of Conductor in Wildfire Risk Area	Percentage in Wildfire Risk Area
Sub-Transmission Conductor	55	45	80%
Distribution Conductor	405	363	100%
Fiber Optic Cable	14	5	35%

Asset	Quantity	Percentage in Wildfire Risk Area
Substations	5	100%
Structures	8913	100%

The following picture is United Power's Mountain District. The blue highlight indicates our Powerlines both Sub-Transmission and Distribution circuits.





## Risk Assessment – Mountain District

Wildfire Risk is the overall composite risk occurring from a wildfire derived by combining infrastructure data, wildfire risk which includes burn probability and values at risk ratings along with suppression difficulty. The risks are categorized in four tiers: low, medium, high, and severe.

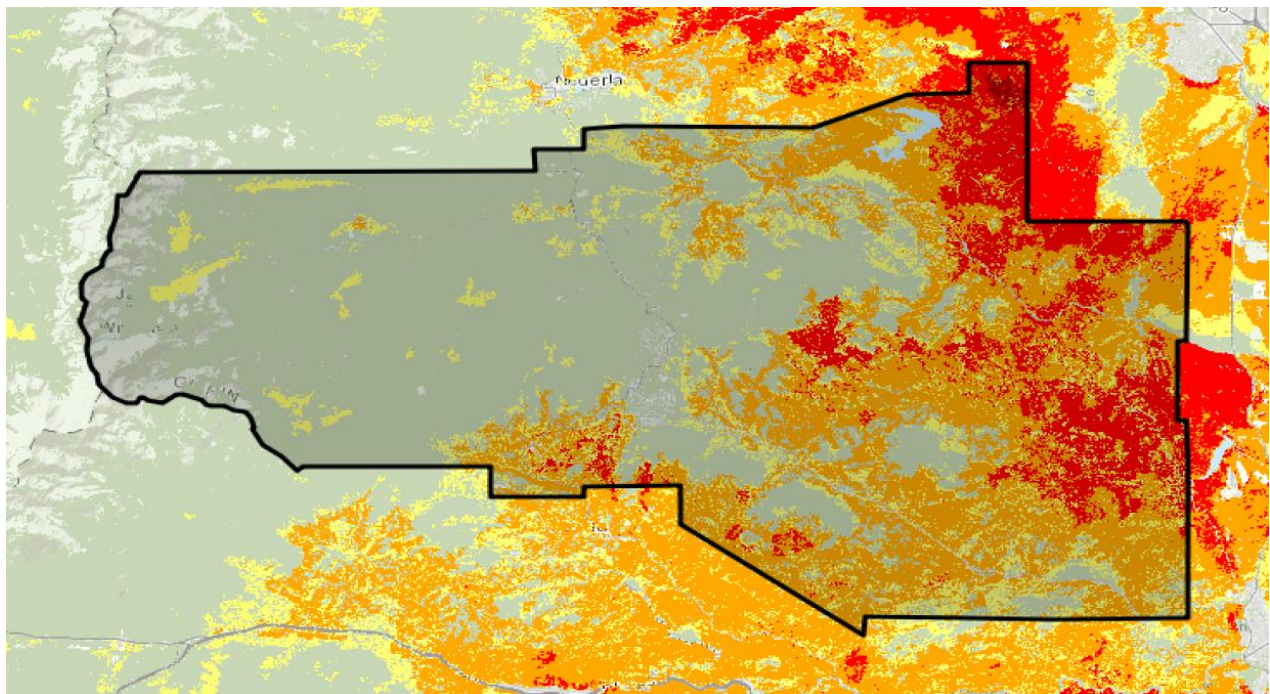
**Tier 1** – Low levels of fuel and low housing densities (low)

**Tier 2** – Moderate levels of fuel and low to moderate housing densities (medium)

**Tier 3** – Moderate to high levels of fuel and medium housing densities (high)

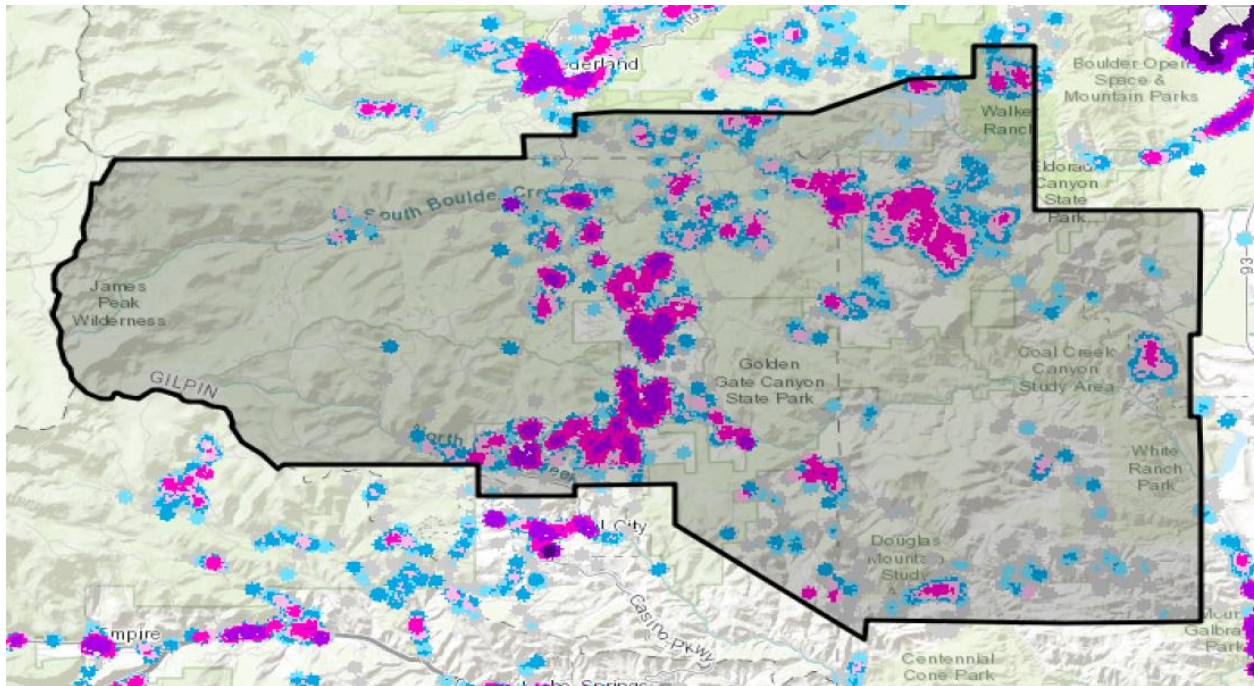
**Tier 4** – High to Severe levels of fuel and high housing densities (severe)

*The following picture depicts an overall Wildfire Risk in our Mountain District.*



Wildfire Risk Class	Rating	Acres (Approximate)	Percent
Tier 1	Low	70,927	51%
Tier 2	Medium	16,406	12%
Tier 3	High	37,106	27%
Tier 4	Severe	13,511	10%
<b>Total</b>		<b>137,950</b>	<b>100%</b>

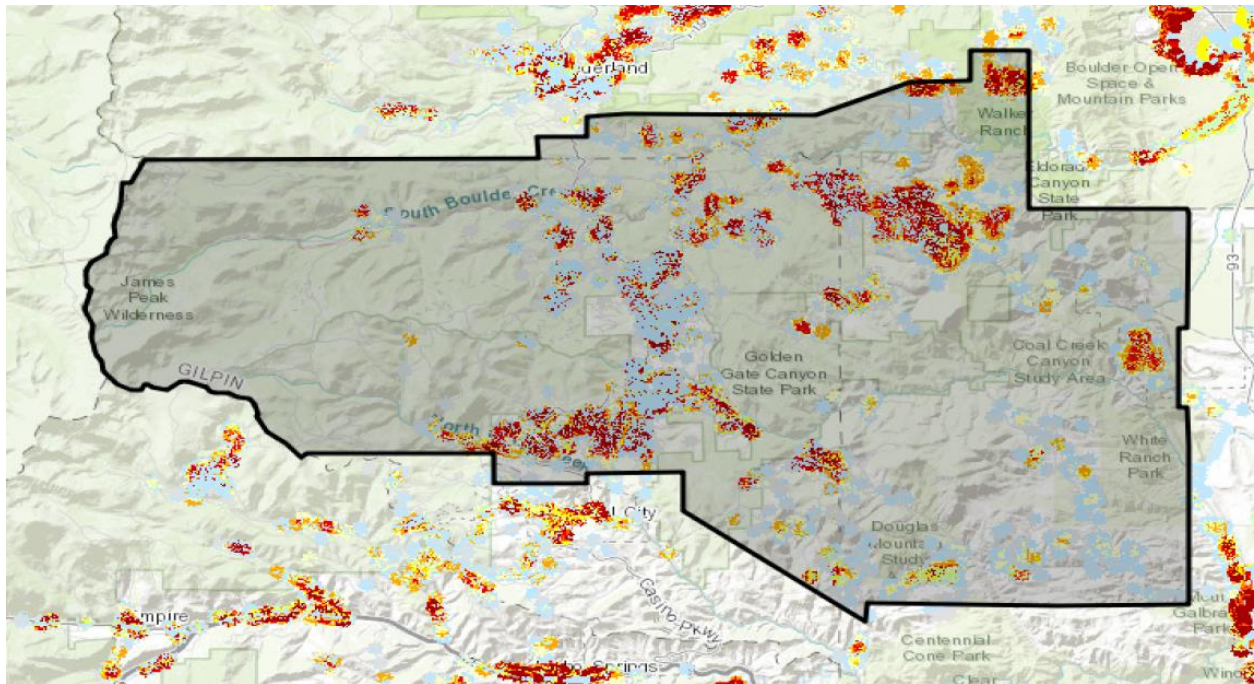
The following picture depicts Wildland Urban Interface in our Mountain District.



Housing Density	Percent of WUI Population	WUI Acres (approximate)	Percent of WUI Acres
Less than 1 house/40 acres	3%	10,980	33%
1 house/40 acres to 1/20 acres	4%	4,930	15%
1 house/20 acres to 1 house/10 acres	9%	5,660	17%
1 house/10 acres to 1 house/5 acres	17%	5,235	15%
1 house/5 acres to 1 house/2 acres	35%	4,970	15%
1 house/2 acres to 3 houses/1 acre	32%	1,670	5%
<b>Total</b>	100%	33,445	100%

Wildland Urban Interface (WUI) reflects housing density where humans and their structures intermix with wildland fuels.

The following picture depicts the WUI Risk Index in our Mountain District.

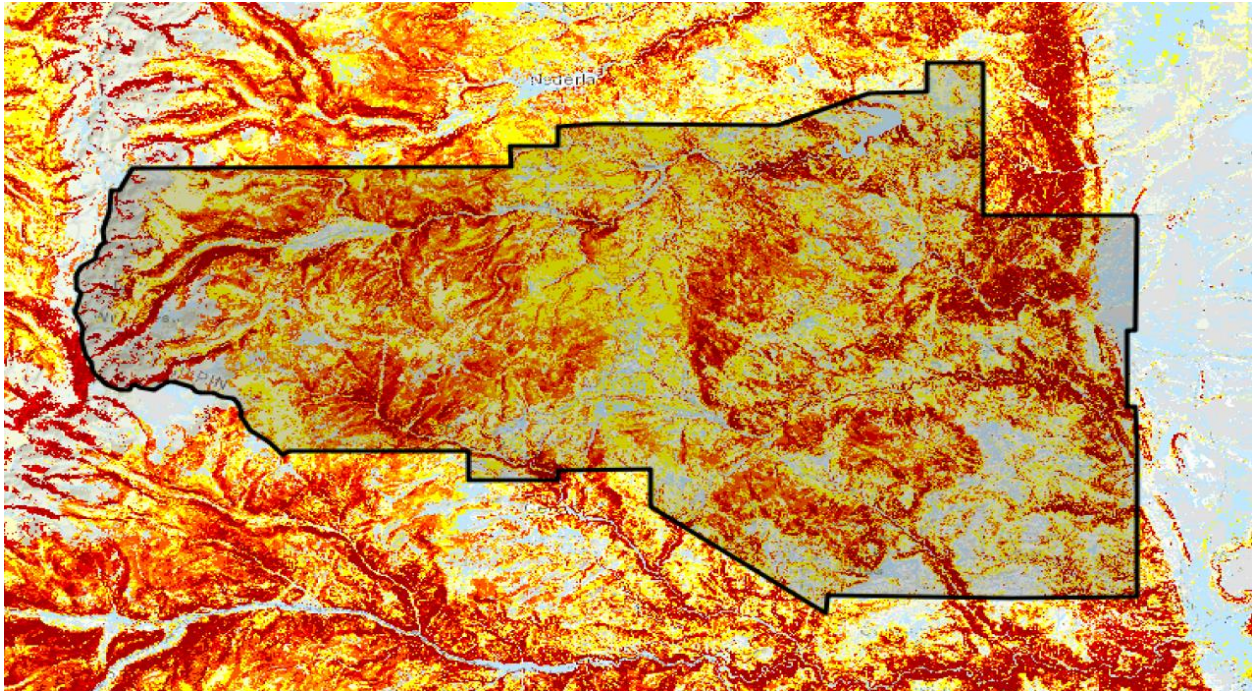


WUI Risk Class		Rating	Acres (approximate)	Percent
Tier 1		Low Negative Impact	20,170	59%
Tier 2		Medium Negative Impact	4,280	13%
Tier 3		High Negative Impact	4,520	14%
Tier 4		Severe Negative Impact	4,475	14%
<b>Total</b>			<b>33,445</b>	<b>100%</b>

The Wildland Urban Interface Risk Index layer is a rating of the potential impact of a wildfire on people and their homes. The key input, WUI, reflects housing density consistent with the Federal Register of National Standards. The location of people living in the wildland urban interface and rural areas are essential for defining potential wildfire impacts to people and homes.<sup>3</sup>

<sup>3</sup> Colorado Wildfire Risk Assessment Summary Report based off United Power’s Mountain District

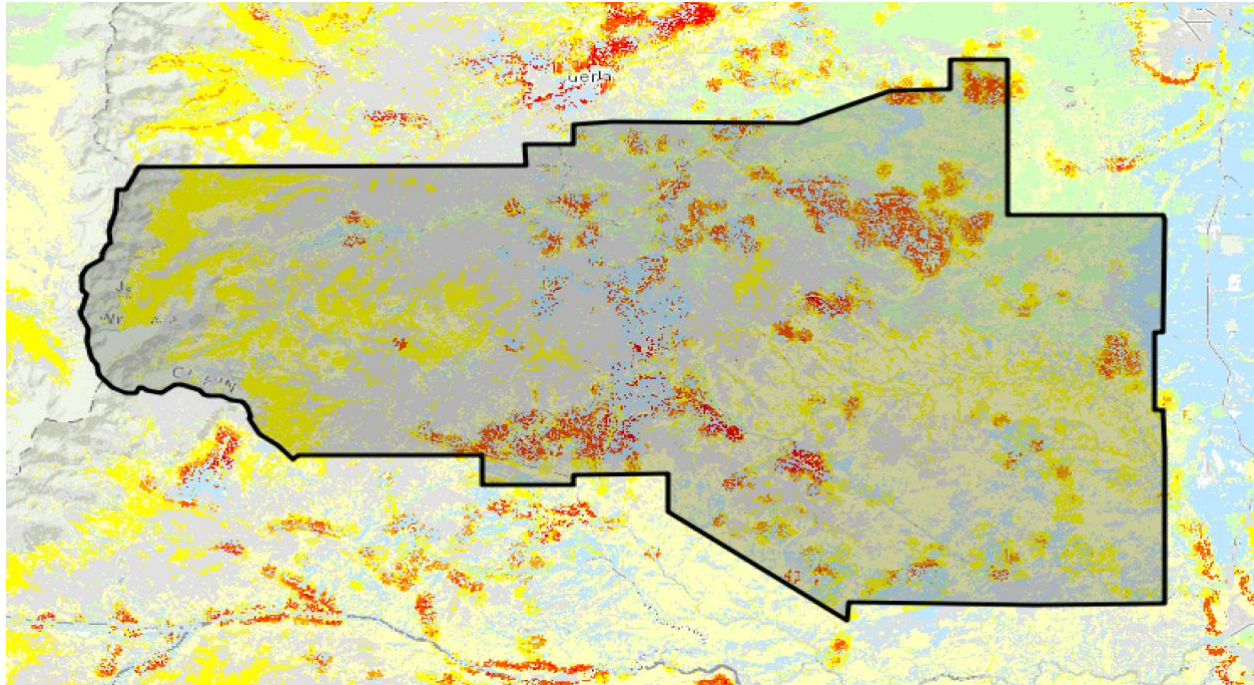
The following picture depicts the Suppression Difficulty in our Mountain District.



Suppression Difficulty Class			Rating	Percent
Tier 1			Slight to Moderate	17%
Tier 2			Moderate to Significant	47%
Tier 3			Significant to Severe	28%
Tier 4			Inoperable	8%
<b>Total</b>				100%

The Suppression Difficulty Rating reflects the difficulty or relative cost to suppress a fire given terrain and vegetation conditions. This rating combines slope steepness, vegetation, and fuel type characteristics to identify areas where it would be difficult or costly to suppress a fire.

The following picture depicts the Values at Risk Rating in our Mountain District.



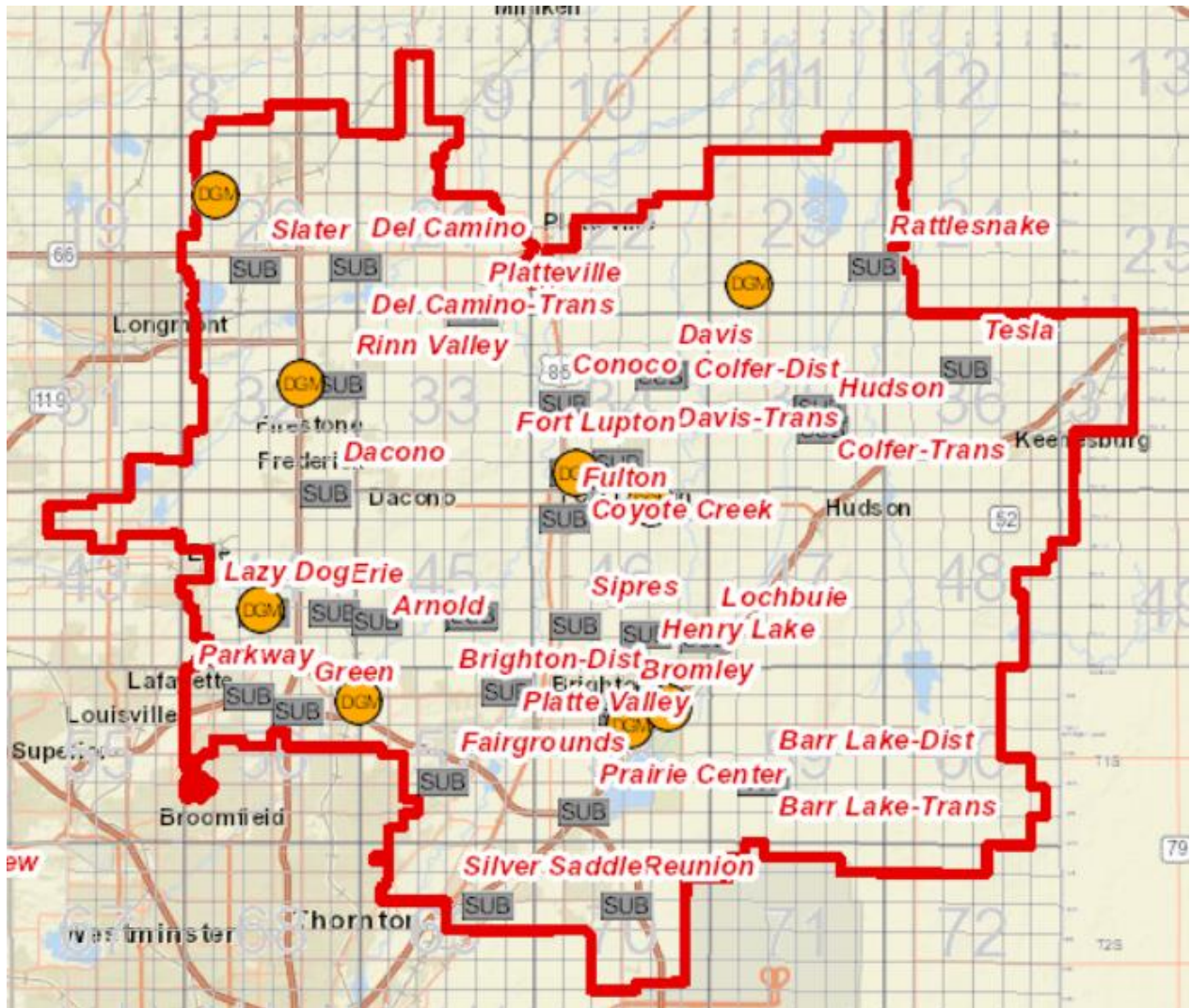
Values at Risk Class			Rating	Percent
Tier 1			Low Negative Impact	51%
Tier 2			Medium Negative Impact	41%
Tier 3			High Negative Impact	6%
Tier 4			Severe Negative Impact	2%
<b>Total</b>				100%

Values at Risk Rating represents other assets that would be adversely impacted by a wildfire. These assets are Wildland Urban Interface, Forest Assets, Riparian Assets and Drinking Water Importance Areas. Calculating the Values at Risk Rating requires spatially defined estimates of the intensity of fire integrated with the identified resource value. The fire intensity level is based off flame length for a location.

## Plains District Risk Data

While our Plains District does not have a high Wildfire Risk, the possibility of a Grassland Fire exists and potentially more destructive. We evaluated the risk areas and included the data in our Fire Mitigation Plan. We have taken a proactive approach to mitigate risk in our Plains territory.

*The following picture depicts United Power's Plains District.*



# Risk Assessment – Plains District

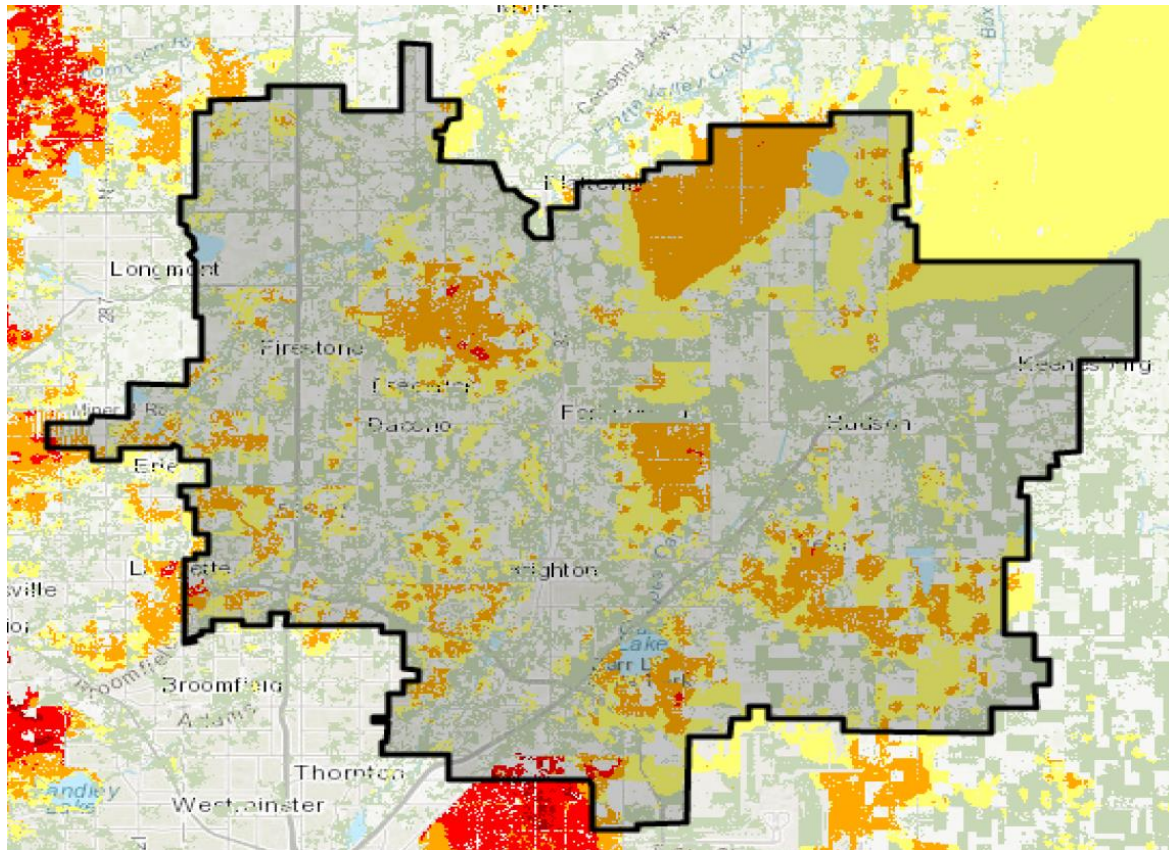
**Tier 1 – Non-Burnable/Lowest Risk**

**Tier 2 – Low Risk**

**Tier 3 – Medium Risk**

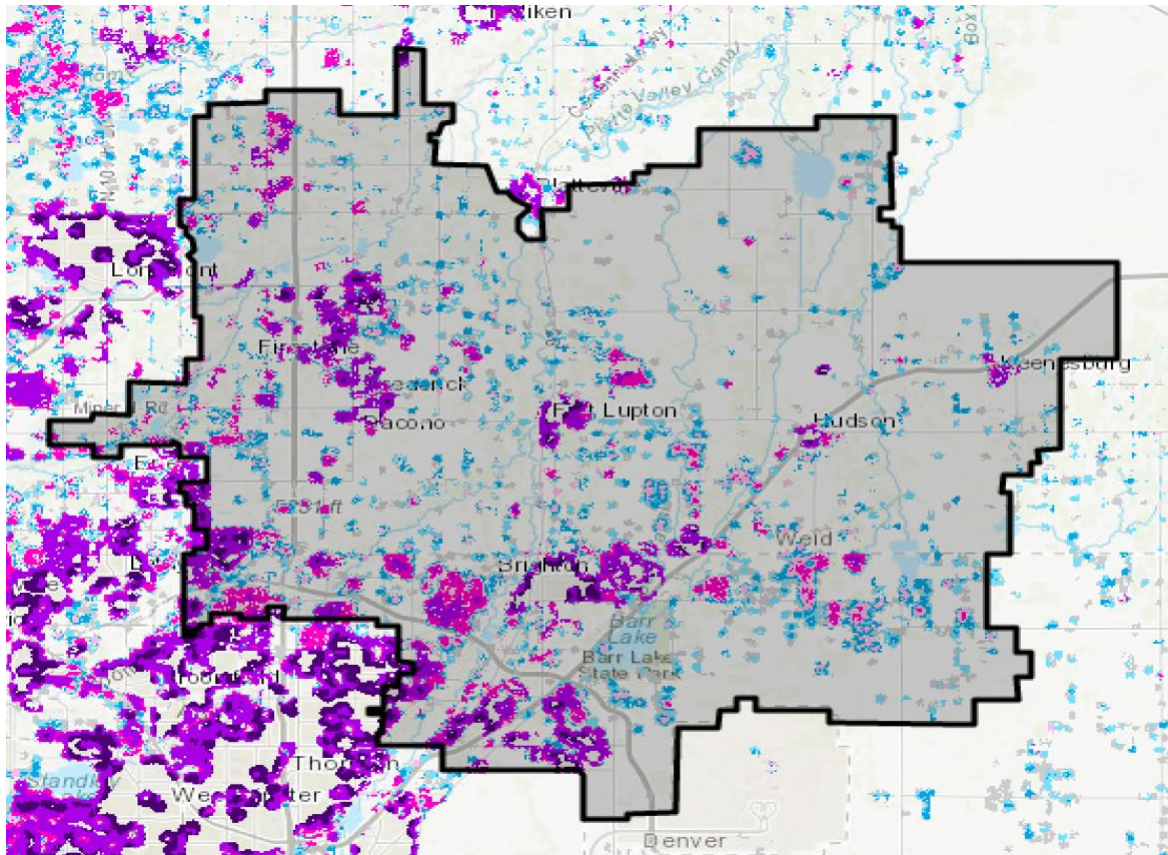
**Tier 4 – High Risk**

*The following picture depicts the overall Wildfire Risk in our Plains District.*



Wildfire Risk Class		Rating	Acres (Approximate)	Percent
Tier 1		Non-Burnable/Lowest	303,665	69%
Tier 2		Low	79,295	18.5%
Tier 3		Medium	53,710	12%
Tier 4		High	1,660	0.5%
<b>Total</b>				<b>100%</b>

The following picture depicts Wildland Urban Interface in our Plains District.

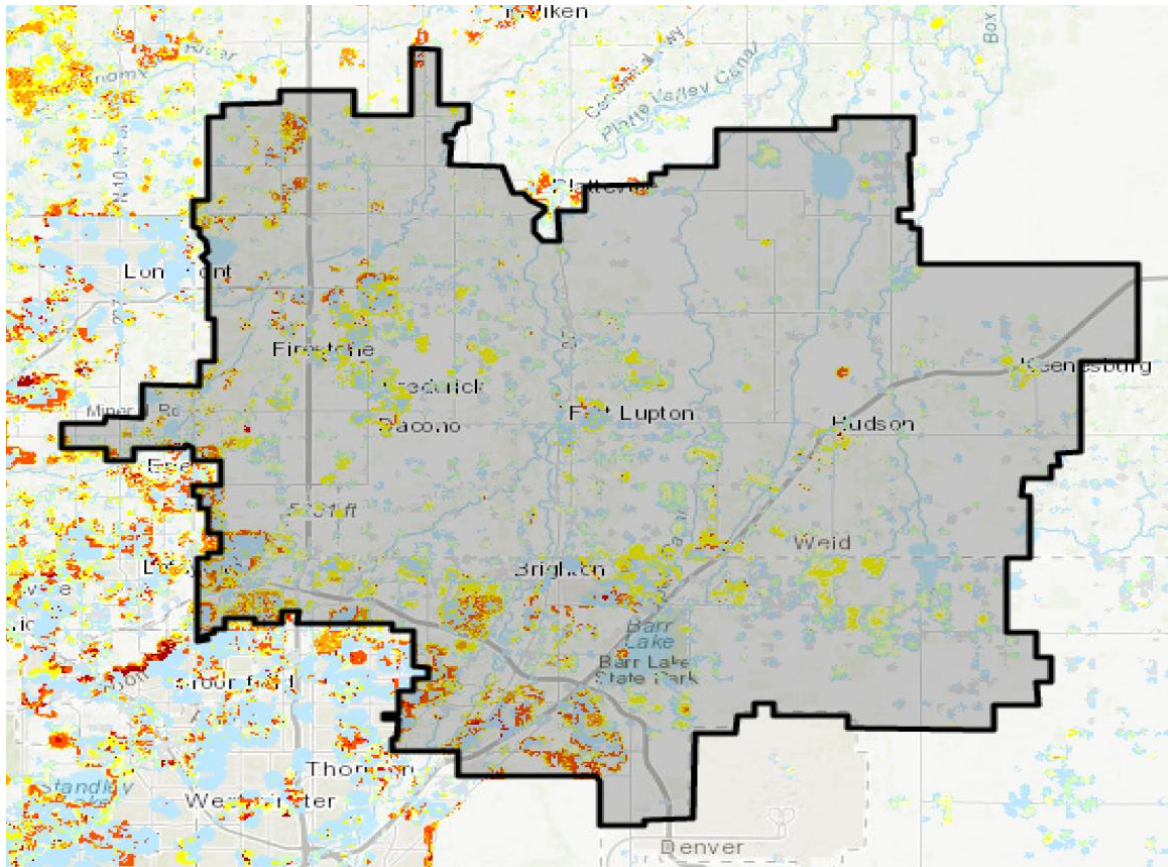


Housing Density		Percent of WUI Population	WUI Acres (approximate)	Percent of WUI Acres
Less than 1 house/40 acres	to 1 house/20 acres	3%	38,620	37%
1 house/20 acres to 1 house/10 acres		3%	16,150	16%
1 house/10 acres to 1 house/5 acres		4%	13,315	13%
1 house/5 acres to 1 house/2 acres		9%	13,400	13%
1 house/2 acres to 3 houses/1 acre		45%	17,050	17%
More than 3 houses/acres		36%	3,540	4%
<b>Total</b>		100%	102,075	100%

Wildland Urban Interface (WUI) reflects housing density where humans and their structures intermix with wildland fuels.



The following picture depicts the WUI Risk Index in our Plains District.

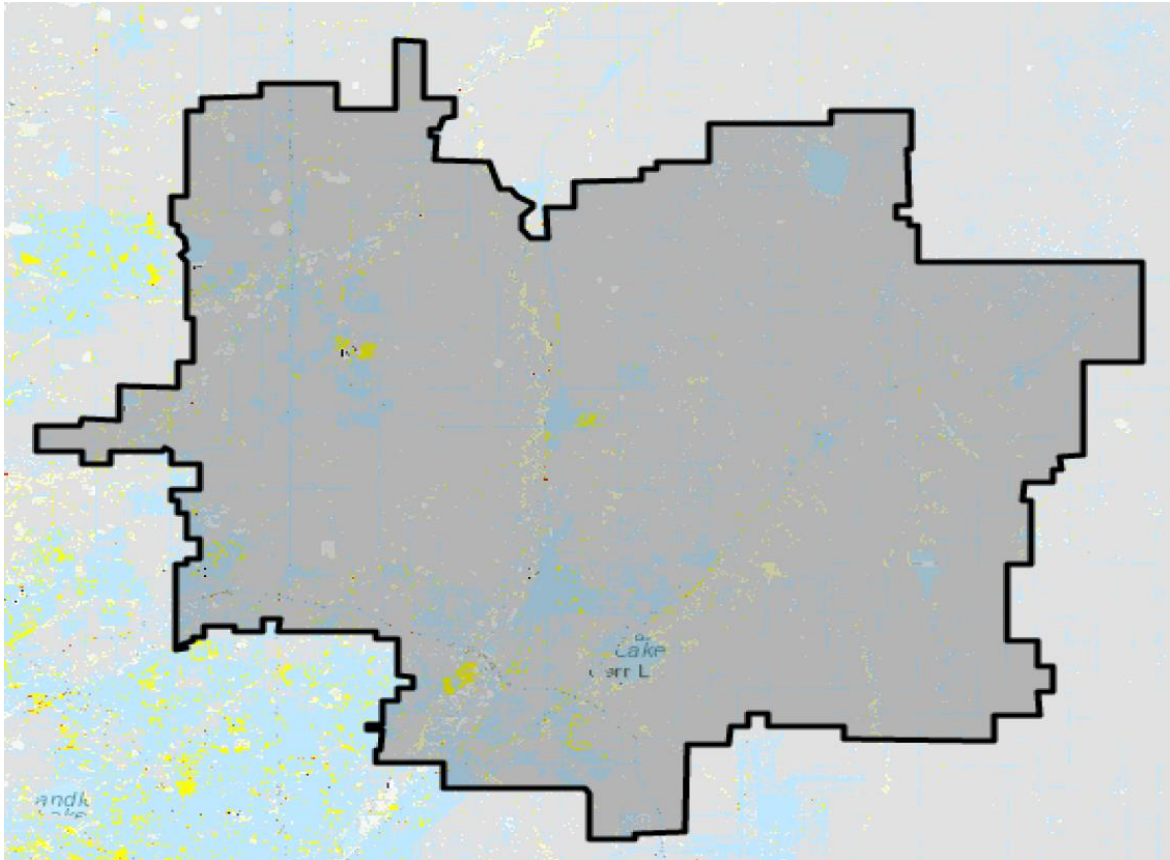


WUI Risk Class		Rating	Acres (approximate)	Percent
Tier 1		Least Negative Impact	54,210	51%
Tier 2		Low Negative Impact	26,250	26%
Tier 3		Medium Negative Impact	21,225	22%
Tier 4		High Negative Impact	390	1%
<b>Total</b>			102,075	100%

The Wildland Urban Interface Risk Index layer is a rating of the potential impact of a wildfire on people and their homes. The key input, WUI, reflects housing density consistent with the Federal Register of National Standards. The location of people living in the wildland urban interface and rural areas are essential for defining potential wildfire impacts to people and houses.<sup>4</sup>

<sup>4</sup> Colorado Wildfire Risk Assessment Summary Report based off United Power’s Plains District

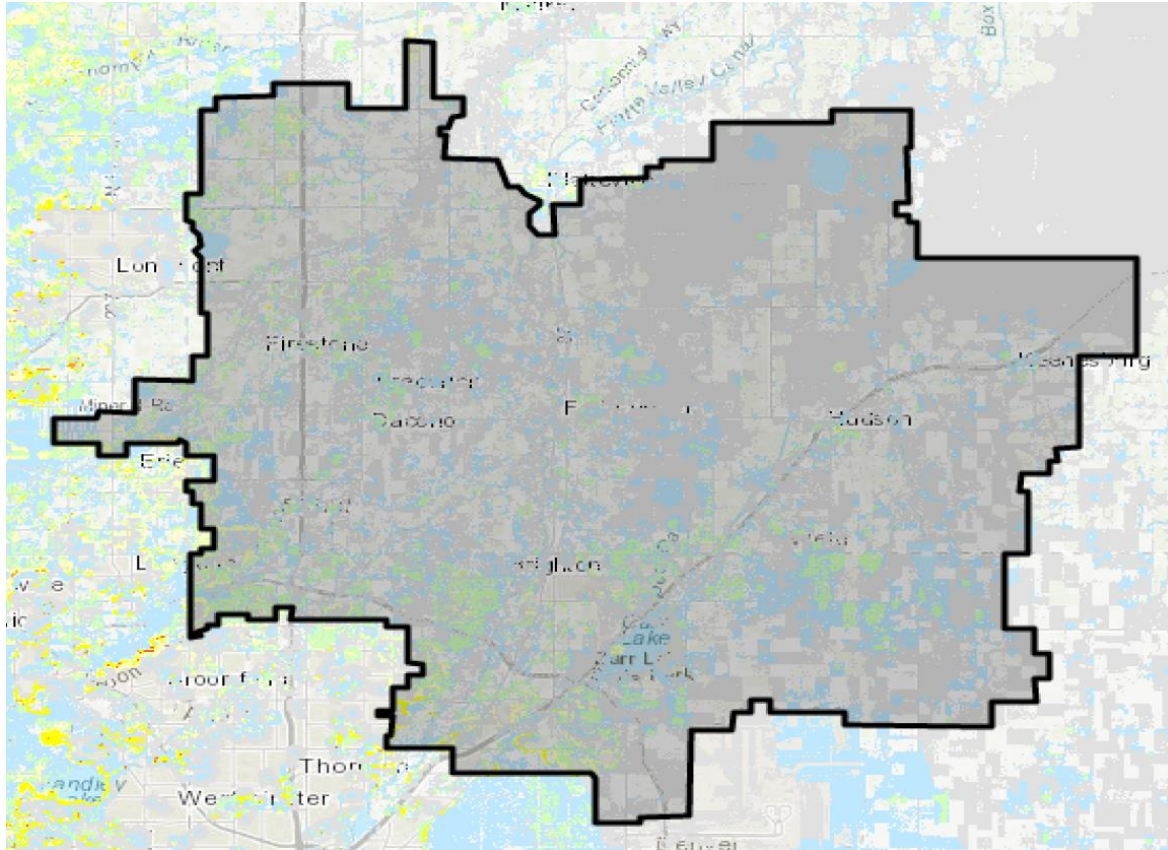
The following picture depicts the Suppression Difficulty in our Plains District



Suppression Difficulty Class			Rating	Percent
Tier 1			No to Slight Limitations	98.8%
Tier 2			Moderate to Significant	1.2%
Tier 3			Significant to Severe	0.0%
Tier 4			Inoperable	0.0%
<b>Total</b>				<b>100%</b>

The Suppression Difficulty Rating reflects the difficulty or relative cost to suppress a fire given terrain and vegetation conditions. This rating combines slope steepness, vegetation, and fuel type characteristics to identify areas where it would be difficult or costly to suppress a fire.

The following picture depicts the Values at Risk Rating in our Plains District.



Values at Risk Class			Rating	Percent
Tier 1			Low Negative Impact	98.2%
Tier 2			Medium Negative Impact	1.8%
Tier 3			High Negative Impact	0.0%
Tier 4			Severe Negative Impact	0.0%
<b>Total</b>				100%

Values at Risk Rating represents other assets that would be adversely impacted by a wildfire. These assets are Wildland Urban Interface, Forest Assets, Riparian Assets and Drinking Water Importance Areas. Calculating the Values at Risk Rating requires spatially defined estimates of the intensity of fire integrated with the identified resource value. The fire intensity level is based off flame length for a location.

## Plan Recommendation Summary

Recommendations might be in the planning stages, on-going construction or completed and will be grouped into four categories. While fire mitigation is a high priority for our Mountain District, our Plains District can also be affected by fires. Recommendations for both districts are included and stated in this plan summary.

- **System Hardening** – Replace infrastructure in fire prone areas, which mitigates the likelihood of a spark-ignition source. By undergrounding electric power lines, we dramatically reduce the impact of a wildfire. Routine inspections and maintenance of electrical system help ensure safe reliable electric service. Protect critical infrastructure from the impacts of a fire.
- **Vegetation Management** – Identify potential vegetation encroachment, plan, prioritize and eliminate risks based on criticality score. Create fire breaks for defensible space near critical infrastructure. Reduce vegetative fuels while cycle trimming or removing trees.
- **Situational Awareness** – Add technology and field equipment allowing company personnel to monitor and respond efficiently to variable weather and fire threat conditions. Ensure field personnel and contractors are prepared during fire season.
- **Community Outreach** – Communicate with various groups, such as County Office of Emergency Management, Fire Departments and Members regarding United Power’s Wildfire Mitigation Plan. Participate in wildfire preparedness committees and task forces. Build partnerships to ensure a resilient community.

The following tables provides information about the recommendations.

<b>SYSTEM HARDENING</b>			
<b>RECOMMENDATIONS</b>	<b>BENEFITS</b>	<b>STATUS</b>	<b>DISTRICT</b>
Fire Protection Wraps for Wood Poles	Helps reduce the cost of post fire pole repairs and replacements	On-going Installation	Mountain District
		Installation to begin in 2022	Plains District
Hendrix Covered Cable System	Reduces outages caused by high winds and/or momentary tree contact.	On-going Installation	Mountain District
ELF – Current Limiting Dropout Fuse	Internally contains the possible arc during a fault interruption and limits the amount of fault current.	On-going Installation	Mountain District
Covered Conductor	Prevents faults due to contact by trees or animals, resists abrasion, electrical tracking, and UV degradation.	On-going Installation	Mountain District
Underground Cable	Significantly reduce the impact of a wildfire, improve reliability, and reduce vegetation maintenance costs.	On-going Installation	Mountain District
			Plains District
Schweitzer Arc Sense Technology	High-impedance fault detection	On-going Installation	Mountain District
Power Pole Inspections	Identify decay or defects in wood poles. Apply remedial treatments to extend the life of pole and ensure safety.	On-going	Mountain District
		On-going	Plains District
Substation Inspections	Visual inspection and condition-based maintenance to check the reliability of equipment. Infrared cameras to detect hot spots.	On-going	Mountain District
		On-going	Plains District
Drone Inspections	Obtain visual photos of structures and attached hardware. Thermal imaging detects heat or hot spots to ensure system integrity.	On-going	Mountain District
		On-going	Plains District

<b>VEGETATION MANAGEMENT</b>			
<b>RECOMMENDATIONS</b>	<b>BENEFITS</b>	<b>STATUS</b>	<b>DISTRICT</b>
Digital Data Collection	Helps detect vertical clearance between power lines and trees.	On-going	Mountain District
Cycle Trim	Analysis for future trim year at circuit, line segment and span level.	On-going	Mountain District
		In Planning	Plains District
Hazard Tree Management	Remove dead, dying or diseased trees from power lines.	On-going	Mountain District
			Plains District
Planning and Tracking Actions for Contractors	Verify Pre-trim and Post-Trim inspections through Intelligent Vegetation Management System.	On-going	Mountain District
Fire Break at Critical Infrastructures	Remove vegetation around Substations and near Coal Creek Canyon Office.	On-going	Mountain District
Dig Safe, Plant Safe	Safe tree planting information guide.	On-going	Mountain District
			Plains District
Fuel Reduction	Track quantities of vegetative fuels being removed during cycle trims/tree removals.	On-going	Mountain District
		In Planning	Plains District

<b>SITUATIONAL AWARENESS</b>			
<b>RECOMMENDATIONS</b>	<b>BENEFITS</b>	<b>STATUS</b>	<b>DISTRICT</b>
Supervisory Control & Data Acquisition (SCADA)	Allows monitoring of Substation equipment and specific field devices.	On-going	Mountain District
			Plains District
Fire-Weather Dashboard	Weather forecast and active fires in Colorado. Remote Automated Weather Stations with temperature, humidity, wind speed, and vegetative fuel moisture.	In Planning	Mountain District
			Plains District
Wildfire Cameras	Detect, verify, and monitor wildfires, lightning strike data and alerts.	In Planning	Mountain District
			Plains District
Wildfire Sensors	Chem Node Sensor for wildfire and particulate detection.	In Planning	Mountain District
Backpack Fire Pump	Access to water in case of emergency.	On-going	Mountain District
			Plains District

<b>COMMUNITY OUTREACH</b>			
<b>RECOMMENDATIONS</b>	<b>BENEFITS</b>	<b>STATUS</b>	<b>DISTRICT</b>
Colorado Utility Wildfire Summit	Discuss Fire Mitigation, joint efforts, and lessons learned with neighboring utilities.	On-going (Annual)	Mountain District
			Plains District
Gilpin County Hazard Mitigation Committee	Coordinate with Gilpin County and affected entities to update the Hazard Mitigation Plan.	On-going	Mountain District
Office of Emergency Management	As a stakeholder be involved with training, coordinating efforts, and preparation if an emergency occurs.	On-going	Mountain District
Fire Protection Agencies	Discuss fire mitigation with first responders.	On-going	Mountain District
		On-going	Plains District
Red Cross Disaster Shelter	Training to aid Red Cross in the event of an emergency.	Complete	Mountain District
Fire Mitigation Flyer	Information for our communities regarding our Fire Mitigation.	On-going	Mountain District
			Plains District
Community Events	Meet, inform, and build relationships with our Member's at Community Events.	On-going	Mountain District
			Plains District



## Plan Recommendations by Category

### *System Hardening*

- **Wood Pole Protection** – United Power has installed Osmose Fire-Guard Wood Pole Protection on approximately 120 Power Poles in our Mountain District. Fire-Guard Wrap protects the power pole from damage when exposed to fire. It is breathable and does not encapsulate moisture or promote decay. Other products are available to protect wood power poles. Benefits include reducing the cost of post fire pole repairs and replacements. Products can withstand years of outdoor weathering, multiple burns depending on intensity and duration of the burn. We are in the planning process of adding wood pole protection on critical infrastructure in our Plains District.
- **Hendrix Covered Cable System** – Also known as Spacer Cable has been installed in our Mountain District on both Sub-Transmission and Distribution Circuits. Benefits include durability, the high-density outer layer resists abrasion, electrical tracking, and UV degradation. It can withstand high winds, temporary contact with trees and limbs which helps prevent faults due to contact.
- **ELF – Current Limiting Dropout Fuses** – We are replacing standard expulsion fuses with new Current Limiting Dropout Fuses in our Mountain District. This type of fuse has two main benefits for fire prevention. First, the fuse will internally contain the resulting arc during a fault interruption. Second, the fuse will limit the amount of fault current that goes through a fuse prior to the fuse blowing, which limits the amount of heat energy given off at a fault location. Additionally, the ELF Fuse operates silently, unlike expulsion fuses.
- **Covered Conductor** – Is like Hendrix Covered Cable System. The difference is we can use standard construction when installing covered conductor. We have rebuilt areas in our Mountain District and will continue rebuilding necessary overhead lines with covered conductor. If possible, we will install underground cable. In the Plains District if we are unable to install underground cable, we may install overhead covered conductor to mitigate grassland fire risk.
- **Underground Cable** – There are many benefits to underground cable such as less maintenance cost for vegetation management and longer useful life. Although, initial cost to install underground cable is greater the useful life is more than 50 years. Improve public safety and appearance, the lines basically invisible. Underground cable improves reliability and reduces service interruptions caused by wind, ice, heavy snow, and lightning. Lastly, the impact of a wildfire is dramatically reduced.
- **Schweitzer Feeder Protection Relay** – Special relay used on protection devices, like substation reclosers. In our Mountain District at Crescent, Lincoln Hills, and Ralston Creek Substations, we have installed reclosers with Schweitzer Relay Arc Sense Technology. This technology looks for high impedance fault, such as downed conductor or a line in contact with a tree. These work by ‘learning’ the system and looking for small

changes in the current and harmonics based against historical data. If the relay determines there is a high impedance fault, an alarm is sent via Supervisory Control & Data Acquisition System (SCADA) to our System Operations Department who will notify field personnel.

### *System Hardening Continued*

- **Power Pole Inspections** – Ground inspections are critical to ensure safe, reliable structures for field personnel and public safety. United Power inspects each pole on an 8–10-year cycle. We have over 59,000 power poles between the Mountain and Plains Districts. Approximately 6,000 poles are inspected every year. Inspectors will identify decay, measure defects, and estimate the pole’s remaining strength. Life of a pole can be extended by applying an effective remedial treatment. If a pole fails inspection, its red tagged, and a work order is created to have the pole changed out.
- **Substation Inspections** – Inspections of Substation equipment is necessary for reliable electric service. Visual inspections of Transformers, Circuit Breakers, CTs, PTs and Disconnects identify any visible abnormality or failure. “Condition Based” monitoring will identify internal defects or abnormalities so that preventive action can be taken. Infrared cameras are used to detect hot spots where a loose or failing connection might be located. Additionally, checking the grounding system for loose connections on equipment, structures, panels, and other equipment.
- **Drone Inspections** – Colorado Aerial Imaging specializes in using drones to take pictures and/or videos of our infrastructure. With this technology we get a bird’s eye view of the structure, attached hardware, and can detect problems missed by ground inspections. The drone gives a broader view of structures, material, and terrain which is beneficial for job planning. To easily identify locations, all photos are tagged with geographical coordinates. Our field personnel can study photos, get material, equipment, tools and know how many crew members it will take for the job. The drone can fly power lines quickly and with minimal intrusion to our members. Additionally, the drone captures thermal imaging to detect hot spots. This valuable information allows us to fix an outage before it occurs.

Colorado Aerial Imaging started flying drones for us in 2015. In our Mountain District they have flown 50 miles of power lines and photographed 905 structures. Calculating the miles of line in our Plains District is not easy with overhead and underground. As of 2021, they have photographed over 9,340 structures in our Plains District.

## *Vegetation Management*

- In our Mountain District, we are using a vegetation management solution developed by AiDash. AiDash's Intelligent Vegetation Management System (IVMS) leverages the power of artificial intelligence (AI) in combination with satellite imagery to identify vegetation risks along our power system. While the technology is complex, the solution is quite simple. IVMS uses current satellite imagery to detect horizontal and vertical distances between power lines and trees. It then leverages several years of historical satellite imagery to create a growth rate model of all vegetation to predict an accurate and optimal trim cycle for each segment along our system. Lastly, IVMS assigns a criticality score to all circuits/segments of our system based on how many members would be affected by an outage if a tree fell into a power line. Through IVMS, all future vegetation work can be prioritized, scheduled, and sent to contractors. Post trim audits are also preformed through satellite imagery, ensuring areas are trimmed according to our specifications. This IVMS data is invaluable for optimizing the budget and improving our planning process.
- In our Mountain District, we have created a 'Fire Break' around specific Substations. By clear cutting trees we create a defensible area around the substation. Heat from a fire can be as dangerous to our infrastructure as the fire itself. In 2022, we will be removing vegetative fuels such as grasses and weeds around the perimeter fence line of our Substations and near our Coal Creek Office. Removing dangerous vegetation fuels, we mitigate damage from a wildfire to our critical infrastructure.
- 'Prevent Outages and Fires – Keep Trees Away from Wires' and '10 Feet for Safety' are United Power's current slogans to help inform our members about safe vegetation and our fire mitigation plan.
- 'Dig Safe, Plant Safe' is an informational flyer for Member's in the Plains District and Mountain District. Which explains tree height and how close to plant trees near power lines.
- Fuel Reduction in our Mountain District is a high priority. By tracking the quantity of chips, slash and wood removed during projects we can calculate the fuels being reduced during cycle trims and tree removals. In 2021, United Power, Gilpin County OEM and Timberline Fire Protection Department joined forces to help members of a subdivision reduce fuels on their property. Members stacked their slash appropriately along the road, we chipped and hauled the slash. We removed 325 cubic yards of slash. The event was successful, and we will have additional events in the future.

## *Situational Awareness*

- United Power's Substation devices in the Plains and Mountain Districts can be controlled by our System Operations Department via Supervisory Control & Data Acquisition (SCADA). There are also field devices with this technology. SCADA allows us to monitor the electric system 24x7.
- There are several options to monitor weather and fire conditions in Colorado. During 'fire season' System Operations will be monitoring both conditions closely to ensure we are prepared if a wildfire threat occurs.
- United Power is in the planning stages of increased situational awareness with new technology for early detection of wildfires, grassland fires, sensors, and different weather stations. Currently, at our Substations we track temperature, humidity, and wind speed. Technology like wildfire cameras and sensors detect smoke, fire, ground temperature changes, and lightning strikes then sends an alert to company personnel. Early detection of an emergency can reduce response time, help protect lives and ensure critical infrastructure has minimal to zero damage.
- Our Field Personnel carry 'Backpack Fire Pump' during fire season. Which allows easy, quick access to water in case of emergency.

## *Community Outreach*

- The Colorado Utility Wildfire Summit is an annual event with our neighboring utilities. In 2021, the conference involved what utilities were doing to mitigate wildfire risk. This year's conference will include wildfire mitigation, lessons learned, new technology being used and utilities working together with the common goal of mitigating Colorado's wildfire and grassland fire risk. United Power is honored to host this year's Summit.
- In our Mountain District, employees participated in Gilpin County's Hazard Mitigation Committee along with several other entities such as Gilpin County Office of Emergency Management (OEM), Timberline Fire Protection Department, Black Hawk Fire Department, National Oceanic and Atmospheric Administration, Clear Creek Sheriff, and many more. The Hazard Mitigation Plan is reviewed and revised every 5 years.
- In our Mountain District, we are building dynamic working relationships with Gilpin County OEM, Timberline Fire Protection Department, Coal Creek Fire Department, Boulder County OEM, and other entities in the Coal Creek Canyon to provide a resilient mountain community. We will continue building working relationships throughout both Districts.

- In 2021, United Power partnered with Gilpin County Office of Emergency Management and Gilpin County School District to install a 625-kW generator at the District campus. The generator was installed as a safety enhancement to serve both the school and mountain community. In the event of a disaster, Gilpin County OEM can use the site as an emergency shelter.
- United Power is actively involved with the community; attending Fourth of July Celebrations, Parades and Festivals showing members we value their support as well as keeping them informed on Fire Mitigation, Vegetation Management, Electric Vehicles and more. In 2021, we celebrated energizing our 100,000<sup>th</sup> meter and the opening of our Carbon Valley Service Center in Longmont.

## Distribution Operations

The primary objective of Wildfire Mitigation is to reduce the potential of a utility involved ignition event and minimize infrastructure damage from wildfires. Much of that effort is established in long-term planning, implementing methods to clear vegetation away from powerlines, installing new technology, and protecting critical infrastructure from fire damage.

The Marshall Fire occurred 2.5 miles away from our Plainview Substation, which is critical infrastructure for serving our Mountain District. System operations, upper management and our engineering department monitored the situation and took necessary steps to ensure safe operations of the electrical system lest the fire spread into our district.

Historically, United Power focused on outage restoration. While major storms present employee and public safety challenges, wildfires heightened those safety challenges. In addition to mitigating wildfire and grassland fire risk, United Power will monitor the following field equipment and operational procedures.

<b>RECOMMENDATION</b>	<b>BENEFIT</b>
Evaluate Recloser Data	Validate operation data for incidents
Fuse Coordination Assessment	Confirm proper fuse size at field locations
Track Cause of Outage	Record cause outages such as down conductor for possible fire ignitions
Track Backpack Water Pump Usage	Ensure field personnel have necessary resources and document usage
Wildfire Notification	Establish a notification plan for wildfire occurrence

## Budget Impacts

The overall budget impacts to mitigating wildfires is minimal compared to the cost of rebuilding an overhead powerline if a wildfire or grassland fire occurs.

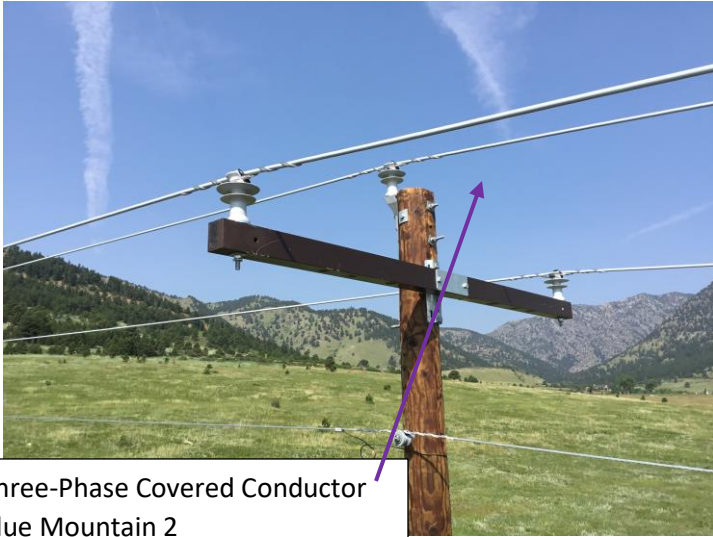
The estimated cost to rebuild 1 mile of a Single-Phase overhead line using Covered Conductor is \$300,000. The estimated cost to rebuild 1 mile of Three-Phase overhead line with Covered Conductor is \$550,000. Keep in mind this is an estimate and many factors are involved when United Power is building overhead power lines.

## Conclusion

United Power is committed to reducing the wildfire risk by incorporating justified and sensible measures. It is not feasible to eliminate fire risk to the electrical system. By continuing to strengthen our system, clear vegetation encroachment, and keep high safety standards we can mitigate the risk.

Our updated Wildfire Mitigation Plan will continue to build on the foundational efforts of the 2019 plan. Focusing on a variety of processes and programs to identify, repair, or replace any facility found to be deficient. We will continue to enhance our electrical system and this plan will evolve over time.

# Pictures



Three-Phase Covered Conductor  
Blue Mountain 2



New Covered Conductor and  
Previous style Copperweld  
New 'smart' Recloser for isolating the Line

Hendrix Spacer Cable  
Sub-Transmission – Plainview 1  
Distribution – Under build  
Crescent 7



Osmose Fire-Guard  
Pole Wrap



Sub-Transmission Line between Crescent &  
Lincolns Hills Substations – Beautiful, Clear  
Cut Right of Way