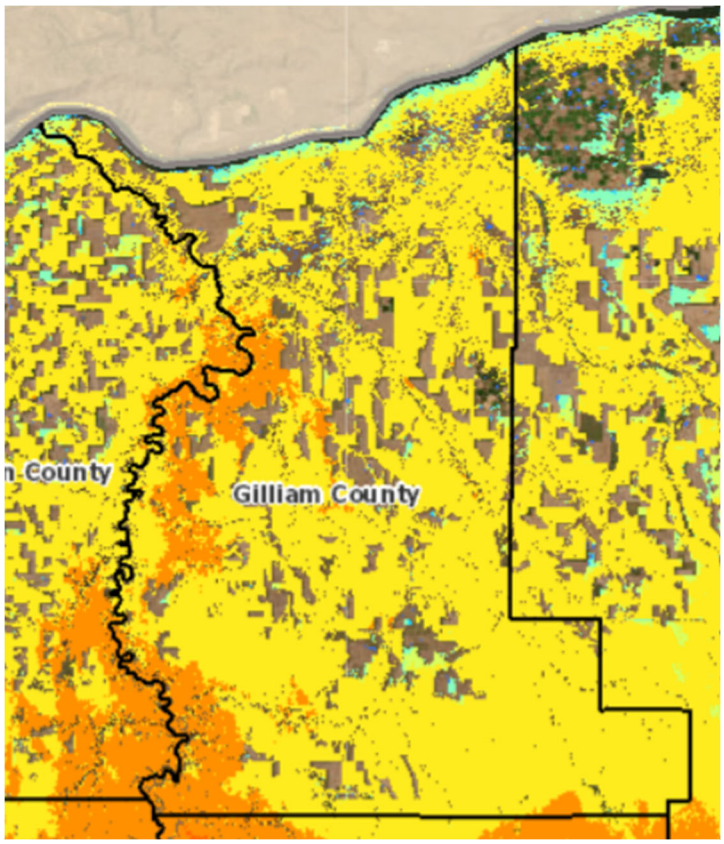
Gilliam County Wildfire Hazard Assessment 2023



Executive Summary

In 2023, in collaboration with the Oregon State Fire Marshal (OSFM), Gilliam County Fire Services conducted a comprehensive wildfire hazard assessment to evaluate the specific risks and hazards associated with wildfires in Gilliam County. This assessment encompassed various critical factors, including access and evacuation concerns, vegetation characteristics, building construction, fire protection assets, and utility information. The assessment was conducted at both the county level and within individual communities, such as Arlington, Condon, and Lonerock, with a holistic approach that considered the entire county population, including those in rural areas.

Key Findings:

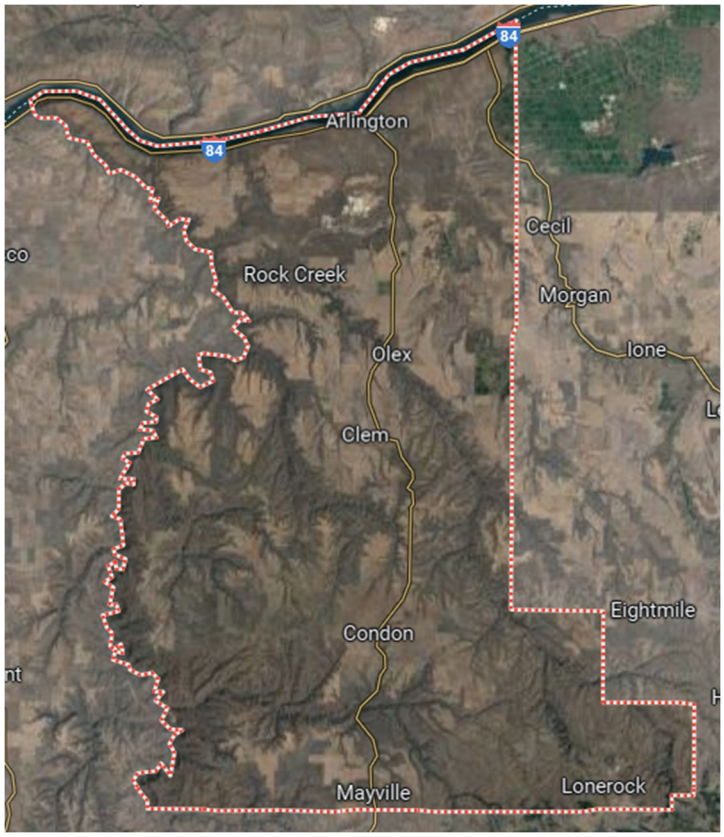
1. **High Wildfire Risk**: Gilliam County is confronted with a substantial risk of wildfires, with occurrences being frequent, primarily in areas characterized by dry annual grass.
2. **Effective Local Response**: While wildfires are a common occurrence, they are typically small in scale and effectively extinguished by the two dedicated fire protection districts serving the county.
3. **Flammable Vegetation**: The county's vegetation is highly flammable, posing a significant hazard, particularly during the summer months when high temperatures and low relative humidity prevail.
4. **Response Time Challenges**: Response times are longer due to volunteer staffing and the vast geographical size of the county, although fire department personnel can access most residences.
5. **Self-Reliant Residents**: Gilliam County's residents are characterized by their independence and preparedness to protect their property in the event of a wildfire.

Recommendations:

1. **Community Outreach**: Prioritize the development of a robust public outreach program aimed at enhancing community preparedness and reducing the overall wildfire risk. This should include education on fire safety and mitigation measures.
2. **Strategic Planning**: Develop clear and specific goals, objectives, and strategies for mitigating wildfire risk at both the county and community levels. Ensure that these strategies are adaptable to the unique characteristics of each area.
3. **Response Time Improvement**: Address the challenges related to response times by recruiting and training additional volunteer personnel, enhancing communication systems, and exploring opportunities for resource optimization.

4. **Collaboration with OSFM**: Collaborate closely with the Oregon State Fire Marshal to leverage their expertise and resources in further strengthening wildfire prevention and protection measures in Gilliam County.

This assessment report provides a foundational understanding of the wildfire risks facing Gilliam County. It underscores the importance of proactive planning and community engagement to reduce the impact of wildfires on our residents and communities. With these findings and recommendations, we embark on a critical journey to enhance our county's resilience and safety in the face of wildfire threats.



Chapter 1: Gilliam County

Chapter 1 contains a risk assessment of Gilliam County as a whole. It contains a description of the community, including a demographic and geographic profile, an assessment of building stock, public safety response agencies, community service organizations, overall wildfire hazards, fire history, and critical infrastructure review.

GILLIAM COUNTY

Wildfire risk in a community depends on many factors. These factors include demographics, geography, weather, vegetation, community attitudes, response agencies and various other factors. This section covers these factors and more.

A. Community Description

Gilliam County is located in north-central Oregon along the Columbia River and John Day River. The County has three incorporated cities, Arlington, Condon and Lonerock, multiple unincorporated communities and several rural homesteads comprised of one to ten houses and multiple outbuildings. Gilliam County is the third least populated county in Oregon, ranking 34 out of 36, while it ranks 24th in largest counties by land area.

The community is rural, with a strong agricultural heritage. Principle industries providing employment are agriculture, two regional waste disposal landfills, county government and education. Gilliam also has significant renewable energy infrastructure in the form of windmills and solar farms, both completed and under development.

The climate is generally dry, with the county receiving between 9 and 14 inches of rain annually (1). The major natural resources are farmland, wind generation, and solar power, as well as the Columbia River on the Northern border of the county. Most of the county is dominated by grass vegetation with scattered brush, such as sagebrush and juniper.

B. Demographic and Economic Information

As of the 2020 Census, the total county population was 1,995, with most citizens residing in the cities of Arlington and Condon with a combined population of 1,342. The population is sparse with an overall average of 1.6 persons per square mile (2).

In 2020, there were 1,095 housing units in the county, an increase of 52 units from the year 2000. 866 of those housing units are occupied and 229 are vacant, yielding an occupancy rate of 79%. There is a low amount of absentee ownership, with most homes being occupied or empty due to disrepair; in 2021 there were a total of 23 seasonal, recreational, or occasional homes throughout the county (3). The homeownership rate is high at 74.8%, more than 10% higher than the State of Oregon's rate (2). The high homeownership rate positively affects the county's overall wildfire risk, as homeowners are more likely to take actions to prepare their homes for wildfire than renters are.

The Gilliam County population tends towards older, with a median age of 53.2 years (13 years older than Oregon Median) and 29.9% of the population being 65 or older. Approximately 323 people in the county are disabled, or 16.2% of the population (2).

The median household income was $51,705 in 2021, approximately 72% of the Oregon median household income (US Census Bureau, 2020). However, despite this low median income, the Gilliam County poverty rate of 11.8% is slightly below the Oregon rate of 12.2%. Income level is

an important risk factor, as people with lower income levels have a more difficult time preparing for and responding to disasters. They can often lack funding needed to make necessary updates to homes and be unable to recover financially if they lose their home to a wildfire.

Primary education is an important County value, with 93% of residents having graduated high school and a school enrollment rate of 87.1%, almost 20% higher than the state's rate. Higher education rates in Gilliam County are lower than the state average, with 22% of the population having a bachelor's degree or higher, compared to 36.3% in Oregon (2). In general, populations with higher education rates tend to have reduced risk of natural hazards, including wildfire.

While Gilliam County is an agricultural community, agriculture is the 4th largest employer at 12.9%. Educational services, health care, and social assistance employ the most people, at 19.7%, closely followed by professional, scientific, and management, and administrative and waste management services at 17.9%. Arts, entertainment and recreation, and accommodation and food services employ 14.8% of the community (2).

The communities in Gilliam County value social interaction and participation, but due to low population density, reaching everyone can be difficult, especially the roughly 653 residents who do not live in the major cities. Many of the older residents, especially the ones that live out of town are isolated from the larger community as a whole. These residents rely on word of mouth, telephone, and posters around the towns to receive information, and while many have internet connectivity they do not use it.

Gilliam County has eight residential internet providers that cover 99.55% of the county, making digital connectivity available to almost all residents. Digital subscriber line (DSL) is available to most of the County, and 36.24% of the county can connect to high-speed fiber internet. Satellite internet is also available throughout the county, and many rural residents will use satellite providers versus DSL for faster internet speeds (4). Despite the high internet coverage rates, it is not uncommon for elderly residents in rural areas to not have internet connectivity. Homes without internet also frequently have no cell phone service, with the only way to reach residents being through landline telephone or direct contact. These areas with no cell phone service and internet can create communication black holes, making emergency communication very difficult. County emergency alerts for wildfires, severe winter storms, red flag warnings, and other hazardous events are sent via text message and through email, residents without cell phone service or internet do not receive them. In the event of an evacuation, first responders may need to physically knock on doors to ensure residents are aware of the danger, as they might not receive notification otherwise.

C. Vulnerable Populations and Underserved Communities

Identifying vulnerable populations is essential to fully understanding a community's wildfire risk. It is common for vulnerable populations to have trouble preparing for and responding to emergencies due to both social and economic factors. Age, income level, access to resources, disability and other factors influence potentially vulnerable populations (3). All of these factors

contribute to vulnerable populations being disproportionately affected by wildfire disasters, especially because they lack resources, may experience cultural and institutional barriers, have limited mobility and/or have compromised physical health (3).

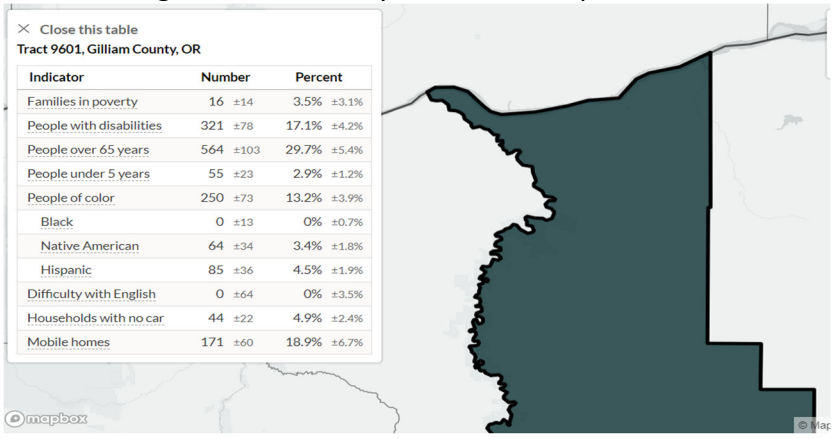
Of these factors, the strongest predictor for compromised health and ability to recover from disasters is low income. “Wildfires disproportionately affect low-income residents because of factors such as inadequate housing, social exclusion, diminished ability to evacuate or relocate and more acute emotional stress,” (3). Low-income residents are also less likely to have adequate insurance, and due to lack of financial resources they may be less likely to perform mitigation activities prior to an event occurring.

Age affects a population’s vulnerability, as both older individuals and children are more severely affected by disasters. Both of these groups are more susceptible to respiratory problems from wildfire smoke. Older populations are more likely to have pre-existing conditions and children with less developed immune systems are more sensitive to diseases (3).

Individuals with disabilities are more affected by wildfire due to disasters leading to reduced access to medical care, and compromised immunity and other conditions can reduce their ability to physically respond to natural disasters (3).

In addition to income and physical characteristics, people without cars are severely affected by disasters. Car access directly correlates to more financial stability, and populations without cars are less likely to be able to evacuate or reach emergency response centers, (3). Residents of mobile and manufactured homes are also more vulnerable; fires spread faster in these types of structures and most homeowners do not own the property that their home is located on, making mitigation measures more difficult (3).

Figure 1: Potentially Vulnerable Populations



Source: USFS (5)

1. Social Vulnerability Index

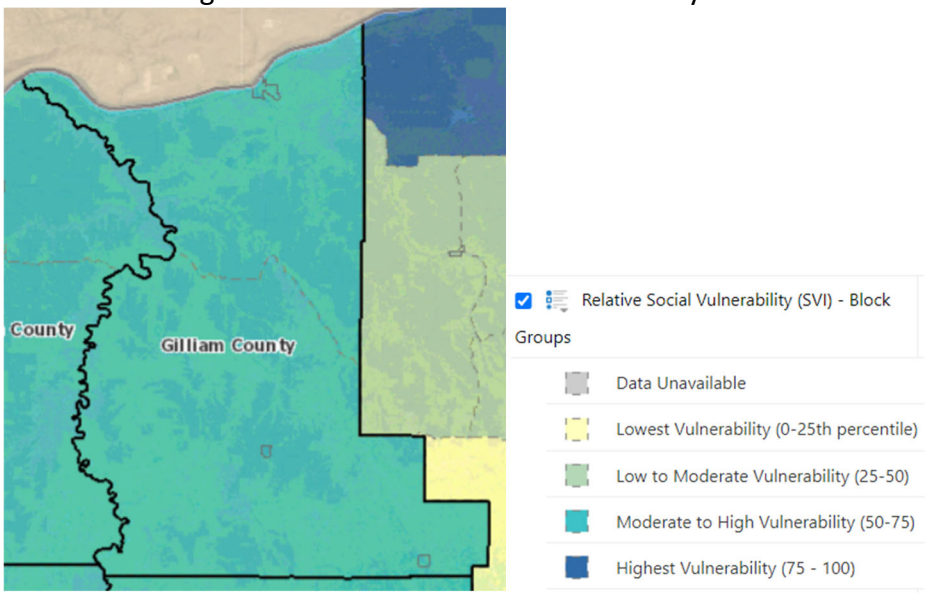
An important factor of a community’s risk to hazards is how socially vulnerable their population is. “Social vulnerability refers to the social, economic and cultural factors that influence access to resources and influence the ability of individuals, households or communities to prevent,

respond to, and recover from events such as wildfire," (6). Factors that affect a person's social vulnerability are income, language proficiency, cultural and psychological relationships to fire and land management and level of trust in the government (6). While very similar to vulnerable populations, the Social Vulnerability Index is calculated using specific methodologies developed by the Centers for Disease Control (CDC) and Agency for Toxic Substances and Disease Registry (ATSDR) (6).

Overall Social Vulnerability of Gilliam County

In 2020, Gilliam County was assessed as having an overall SVI score of 71%, placing the county in the moderate to high social vulnerability range. This means that Gilliam County has a higher social vulnerability score than 71% of other groups assessed in Oregon. SVI is composed of 15 indicators grouped into four related themes, socioeconomic status, household composition, minority status and language and housing type & transportation. Relative social vulnerability takes all these factors into account (6).

Figure 2: SVI Relative Social Vulnerability



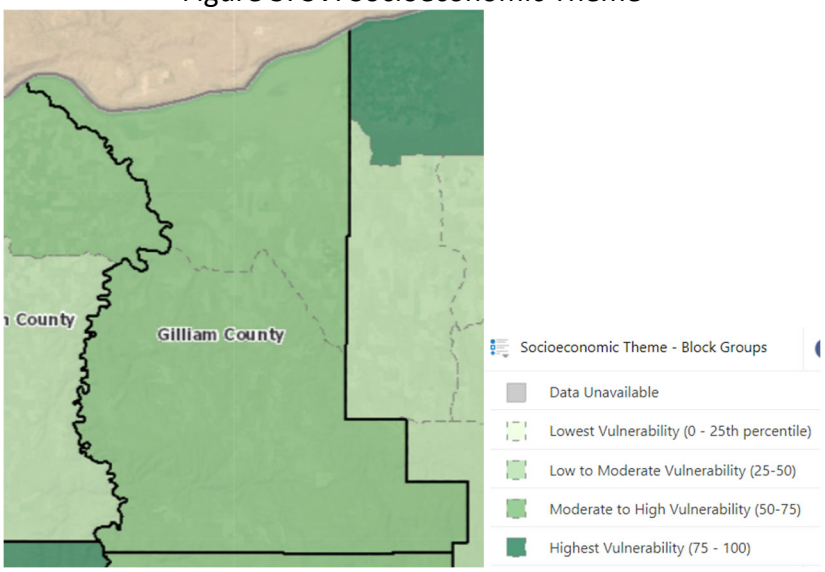
Source: Oregon Wildfire Risk Explorer (7)

Socioeconomic Status

North Gilliam has moderate to high social socioeconomic vulnerability at 70%. The factors that contribute to this high level of vulnerability are North Gilliams poverty rate of 11%, unemployment rate of 6%, per capita income of $26,951 and 7% of the population having an education level less than high school.

South Gilliam also has moderate to high socioeconomic vulnerability at 73%. South Gilliam's poverty rate is 16%, unemployment rate 5%, per capita income is $26,879 and 6% of the population has an education level less than high school.

Figure 3: SVI Socioeconomic Theme



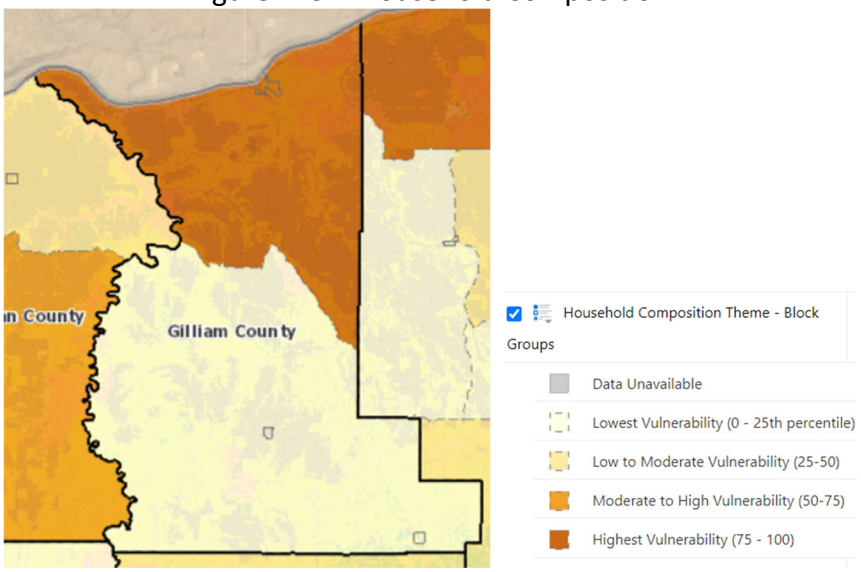
Source: Oregon Wildfire Risk Explorer (7)

Household Composition Theme

North Gilliam's household composition and disability theme score is 82%. This is due to 14% of the population being age 65 or older, 26% being age 17 or younger, and a single-parent household rate of 9%.

South Gilliam's household composition and disability rate is lower, at 22%. This is due to 40% of their population being age 65 or older, 11% being age 17 or younger, and only 1% of households being single parent.

Figure 4: SVI Household Composition



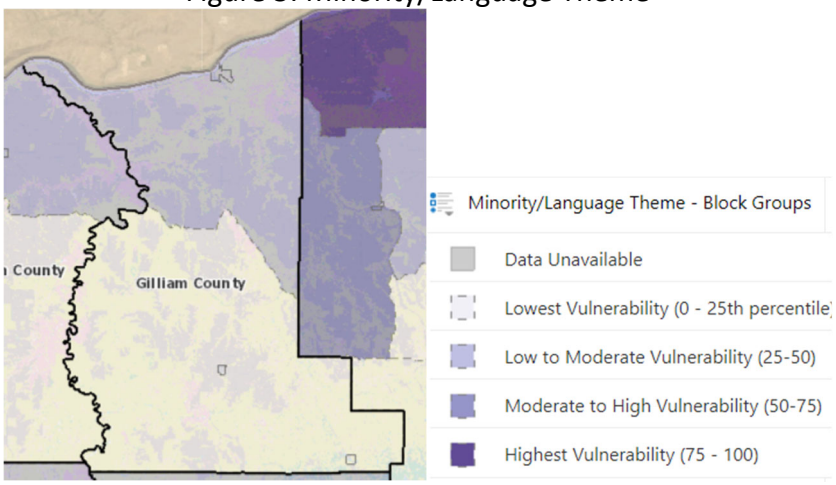
Source: Oregon Wildfire Risk Explorer (7)

Minority/Language Theme

North Gilliam's minority status and language theme score is relatively low at 36%. North's minority population is 16%, and less than 1% have limited English.

South Gilliam also has a low minority status and language theme of 22%. South's minority population is 11% and less than 1% have limited English.

Figure 5: Minority/Language Theme



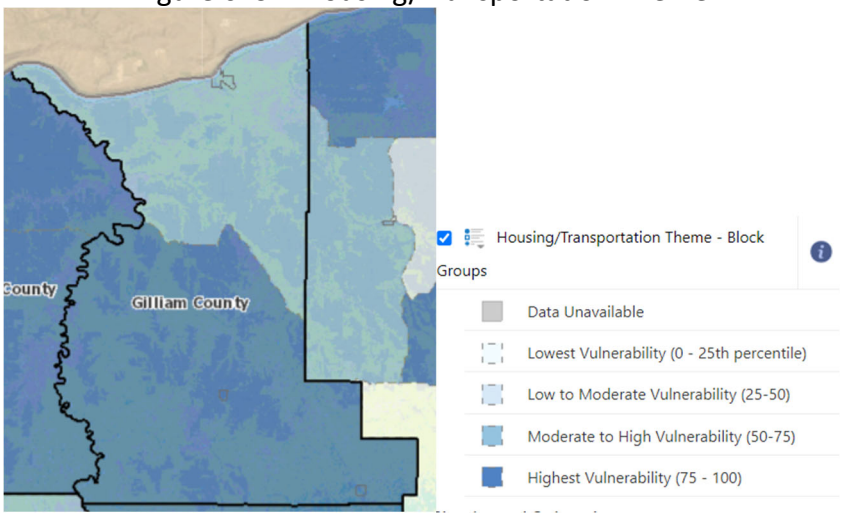
Source: Oregon Wildfire Risk Explorer (7)

Housing/Transportation Theme

North Gilliam's housing type and transportation vulnerability is 64%. This high value is due mainly to the high number of mobile homes, which comprise 33% of total housing available.

South Gilliam's housing type and transportation vulnerability is high at 84%. This is due to 5% of residents living in multi-unit structures, and 9% of total housing being mobile homes.

Figure 6: SVI Housing/Transportation Theme



Source: Oregon Wildfire Risk Explorer (7)

2. Underserved Communities

The State of Oregon has a nuanced demographic landscape, which is crucial for understanding the multifaceted dynamics of historically and currently underserved communities. The State of Oregon has, and by extension Gilliam County, a number of diverse populations, each with its unique needs and characteristics.

Throughout Oregon and Gilliam county, there are Black, African, and African American communities, Latinx and Hispanic residents, individuals of Asian and Pacific Islander heritage, as well as immigrants, refugees, and asylum seekers. Additionally, there are Native Americans and members of Oregon's nine federally recognized tribes, Indigenous individuals, and Alaskan Natives. Undocumented individuals, including DREAMers, alongside linguistically diverse groups, people with disabilities, members of the LGBTQ+ community, aging and older adults, economically disadvantaged citizens, farmworkers, migrant workers, and those residing in the rural enclaves of our state are all underserved communities. This demographic data is instrumental in comprehending the social intricacies that underpin the county's risk assessment and ensuring that our analysis is inclusive and equitable.

Figure 7. Table of Undeserved Communities

Demographic Group	Description
Native Americans	Members of Oregon's nine federally recognized tribes, Indigenous people, Alaska Natives.
Black, Africans, African Americans	Individuals of African descent.
Latinx, Hispanic	Individuals of Latin American or Hispanic origin.
Asian, Pacific Islanders	Individuals of Asian and Pacific Islander heritage.
Immigrants, refugees, asylum seekers	Individuals who have immigrated to the U.S. as refugees or asylum seekers.
Undocumented, DREAMers	Individuals who lack legal immigration status, including those protected under the DACA program (DREAMers).
Linguistically diverse	People who speak languages other than English, reflecting diverse linguistic backgrounds.
People with Disabilities	Individuals with physical or cognitive disabilities.
LGBTQ+	Lesbian, Gay, Bisexual, Transgender, Queer, and other gender and sexual minorities.
Aging/older adults	Elderly individuals and seniors.
Economically disadvantaged	People who face financial hardships and economic challenges.
Farmworkers, migrant workers	Agricultural laborers, often working in rural areas.

Demographic Group	Description
Living in rural parts of the state	Residents of sparsely populated rural regions.

Demographic data is data is not merely statistical but a reflection of the social fabric shaping the risk landscape. In Gilliam County, there are a myriad of identities and backgrounds, each playing a vital role in understanding the vulnerabilities and resilience factors within our county. These findings underscore the necessity of acknowledging the unique needs and experiences of historically and currently underserved communities.

This data serves as a foundational resource in crafting comprehensive risk mitigation strategies that cater to the specific requirements of all residents. This is an important step to fostering an inclusive and equitable county where no one is overlooked, and all voices are heard and addressed in our risk assessment endeavors.
Frequently individuals will identify with multiple different underserved communities, and this should be taken into consideration when planning and responding to disasters, including wildfires (8).

Impacts on Risk

The US Census Bureau defines rural as "open country and settlements with fewer than 2,500 residents," (9). Under this definition, Gilliam County is rural, and therefore an underserved community. At 29.9% of the population, Gilliam County also has a significant number of aging/older adults. Traditionally, underserved communities are hit harder by natural disasters and have a more difficult time recovering from them, mainly due to their lack of resource access. Additionally, socially vulnerable communities are greatly affected by natural disasters, and the more vulnerable a population, the more difficult it is to prepare for and recover from disasters. These factors increase Gilliam County's overall risk to wildfires. When conducting public outreach and when planning mitigation measures, including members of underserved populations is essential to addressing their specific risks. Examining the intersections between underserved communities and socially vulnerable populations and making those areas priorities for mitigation activities will be essential to reducing Gilliam County's risk.

D. Safety Attitudes

Gilliam County citizens are in general informed about wildfire and believe that their homes and public institutions are at risk. The wildland-urban interface (WUI) is anywhere homes and other structures meet the wildland environment, whether that environment is brush or woodland. Due to the small size of each incorporated city, most residents border undeveloped land and while they might not see themselves as living in the WUI, they are aware of the wildfire risk. Gilliam County institutes a burn ban over the summer, with a minimum time of June 1st through September 30th, but will frequently adjust the ban to begin sooner or end later, depending on

the land and weather conditions. Wildfire is an ever-present risk countywide, and most residents respect the burn ban and use safe fire practices.

Every year there are multiple wildfires throughout the county, with an extremely large one happening approximately every 10 years. Most county residents have lived in Gilliam for a long time and will remember these larger fires. The City of Condon was threatened by the Stubblefield Fire in 2018 which was a 54,221-acre fire started by lightning and came within 2 miles of the City. In Arlington, a fire was started by a weed eater during a high wind event that burned down two houses in 2006. Both communities still discuss these large fires when asked about the wildfire risk to their community and are aware of the present danger.

Public education for wildfire risk in Gilliam County takes place but could be improved. Gilliam County Fire Services attends the County Fair and sets up a fire prevention booth. Arlington High School has hosted one fire science class to take high school students through Wildfire Courses 130 and 190 and is exploring offering the course every two to three years. The main outreach for the burn ban is signs throughout the county and on city websites.

E. Geographic Description

Gilliam County is located in North Central Oregon and falls within the Columbia Basin Physiographic Province. The Columbia River comprises its northern boundary, and its western boundary is the John Day River, which it shares with Sherman County. Morrow County borders Gilliam on the east, and Wheeler County borders on the south. Gilliam consists of rolling hills, and areas of flat land and is cut by the steep river canyons of the Columbia River and the John Day River. Elevations range from less than 200 feet along the Columbia River to approximately 4,300 feet in the southeast part of the county, although most of the county is at less than 3,500 feet.

There are 1,233 square miles, or 789,120 acres in the County and about 12 percent of this land is in dry-land grain production annually. Farm and ranching lands primarily produce grains and forage, which present a significant wildfire hazard when the grains have matured and are ready for harvest, normally in July and August. The Natural Resources Conservation Service (NRCS) in Oregon reports that the county has 288,002 acres of dry crop land, 6,571 acres of irrigated cropland and 488,337 acres of rangeland. Of these, 68,180 acres are in the Conservation Reserve Program (CRP) program (10).

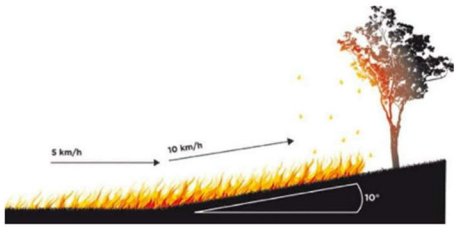
Approximately nine percent of the county is enrolled in the CRP program, with the lands being reseeded to perennial grasses and left as a wildlife habitat for a minimum of nine years. In some instances, re-establishing native bunch grasses can be difficult and the land becomes overloaded with annual invasive grasses which present a larger fire risk than native grasses. Only 1,538 acres in the county (two-tenths of one percent) are classified as timberlands with juniper and ponderosa pine being the principal tree species (10).

Topography varies widely, with gentle slopes on cultivated farmlands and moderate to steep slopes throughout the county, usually combined with limited access. Slopes more than 40 percent are common along the John Day River and its side canyons. Slope has a large impact on wildfire behavior and is the predominate factor that determines the direction and speed of fire if there is no wind. For every 20% slope increase, the rate of wildfire spread quadruples and flame length almost doubles; as well as being the equivalent of adding additional wind speeds. Slope is a strong factor in Gilliam County fire behavior, and it is not abnormal for wildfires to travel so quickly up slopes that it is too dangerous to directly attack flames; they can only be fought from the top down, letting the slopes burn. The Cottonwood Fire in August 2023 burned hot and quick up the slopes and was unable to be fought on the hillsides, responders had to rely on fighting from above and cutting line ahead of the fire to control it; this fire burned a total of 2,370 acres in just one day. Air support is also frequently needed to extinguish flames on steep hillsides. The Devil's Butte Fire in July 2023 burned on such steep slopes that it had to be extinguished with air assets, and responders were unable to directly fight it, burning a total of 2,864 acres including valuable annual grain crops.

Figure 8: Slope Effects on Fire Rate of Spread and Flame Length

Slope Effects on Fire Rate of Spread (ROS) and Flame length (FL)

- 0-20% Slope, negligible impact
- 20-40% Slope, 2x FL, 4x ROS, +1 mph wind
- 40-60% Slope, 2.5x FL, 8x ROS, +2 mph wind
- 60-80% Slope, 3x FL, 14x ROS, +3 mph wind



Source: Wildfire Preparedness in Agriculture (11)

The John Day River, specifically the Cottonwood Canyon State Park area is a major recreation attraction for boaters, fisherman and hunters. Summertime use is often heavy with visitors coming from a regional and national base. Both day use and overnight camping occur, including back country camping far from resources. Slopes along the John Day River are steep, and access to much of the river is very difficult. All of these factors contribute to the area's high vulnerability due to heavy fuel loads, steep slopes, and large numbers of people, many who aren't familiar with high fire danger areas. To add on to these factors, communication is difficult throughout most of the river canyon, with no cell phone service and limited radio coverage. Cottonwood Canyon State Park has a high visitor volume, with approximately 55,372 people visiting the JS Burress Boat Park annually, increasing the area's susceptibility to human-caused fires. According to the Northwest Interagency Coordination Center, the Pacific Northwest has

experienced an increase in human caused fires, and as of September 5th, 2023, had exceeded the annual average of human caused fire starts by 18% (12).

Much of the land within the John Day Canyon is publicly owned and managed by the Bureau of Land Management (BLM). Gilliam County is largely owned by private individuals, with 851,577 acres, or 92% of the land being privately owned. The second largest landholder is BLM at 46,672 acres, followed by the US Army Corps of Engineers at 11,391 acres. A breakdown of land ownership follows:

Figure 9: Land Ownership Breakdown in Gilliam County

Landowner	Number of Acres
Private	851,577
Port of Arlington	51
State of Oregon	1,886
Gilliam County	133
Bureau of Land Management	46,672
Bonneville Power Administration	82
US Army Corps Engineers	11,391
Confederated Tribes of the Warm Springs Res.	4,630
Other	34

Source: NRCS (10)

Gilliam County, nestled in the heart of Oregon, exhibits a mosaic of land ownership patterns, which plays a pivotal role in shaping wildfire management and mitigation efforts. The land in the county is divided among various stakeholders, including private individuals, government entities, and tribal communities. This diverse landscape of land ownership necessitates a multi-pronged approach to wildfire management to address the unique risk profile of the region.

Private landowners hold a substantial portion of the county's land, encompassing approximately 851,577 acres. In the context of wildfire management, private landowners are crucial actors, serving as the initial line of defense against encroaching wildfires. Their active involvement in wildfire prevention and mitigation is of paramount importance. However, to fully harness their potential, collaboration with government agencies becomes essential. The synergy between private landowners and governmental bodies contributes to a more comprehensive approach to wildfire management.

Gilliam County hosts various government agencies, each with distinct responsibilities and jurisdiction. These agencies include the Port of Arlington, the State of Oregon, Gilliam County itself, the Bureau of Land Management, the Bonneville Power Administration, the US Army Corps Engineers, and the Confederated Tribes of the Warm Springs Reservation. The collaborative framework between these government entities is imperative for effective wildfire management. This involves the sharing of critical data, resources, and a coordinated response

strategy. It ensures a unified and efficient reaction to wildfire threats, considering the complexities associated with the ownership of land within the county.

The presence of tribal lands within Gilliam County, exemplified by the Confederated Tribes of the Warm Springs Reservation, adds another layer of complexity to wildfire management. These lands come with their unique challenges and cultural considerations. Collaborative agreements and a shared understanding between the county, federal agencies, and tribal communities are essential to address the distinctive aspects of wildfire management in these areas. The involvement of tribal communities in these cooperative efforts not only acknowledges their unique relationship with the land but also enriches the diversity of strategies employed in wildfire mitigation.

The ownership patterns of land in Gilliam County present a dynamic and intricate landscape that significantly influences wildfire management and mitigation. The cooperation and coordination between private landowners, government agencies, and tribal communities are central to addressing the multifaceted nature of fire management in this region. The ability to foster interagency collaboration, share resources, and exchange crucial data is key to a more robust and adaptive approach to wildfire management. Acknowledging the role of land ownership patterns and promoting collaborative endeavors among stakeholders, Gilliam County can fortify its wildfire management strategies and enhance the resilience of the entire community in the face of wildfire threats. This collaborative spirit is essential in confronting the growing wildfire risks and fortifying fire management and mitigation efforts for the benefit of Gilliam County and its residents.

F. Transportation Infrastructure

Highways and Bridges

Gilliam County possesses a relatively modest transportation infrastructure, owing to its small population. Nevertheless, the role of transportation routes in wildfire scenarios cannot be overstated, particularly concerning evacuation procedures. Despite the county's limited population, the restricted egress options pose a potential challenge, wherein a worst-case scenario could result in the obstruction of a major evacuation route.

Gilliam County is traversed by Interstate 84 (I-84), which aligns with the county's northern boundary. This interstate route features three essential bridges: the John Day River Bridge at Le Page Park, the Arlington Bridge at Arlington, and the Willow Creek Bridge at milepost 148.6 on I-84.

Highway 19, a north-south thoroughfare, intersects the county and hosts three crucial bridges: the Olex Bridge, the Thirtymile Bridge, and the Upper Rock Creek Bridge. Further contributing to the county's transportation network, Highway 206, an east-west route located in the southern region of the county, features the Cottonwood Bridge, designed to facilitate access to Cottonwood Canyon State Park.

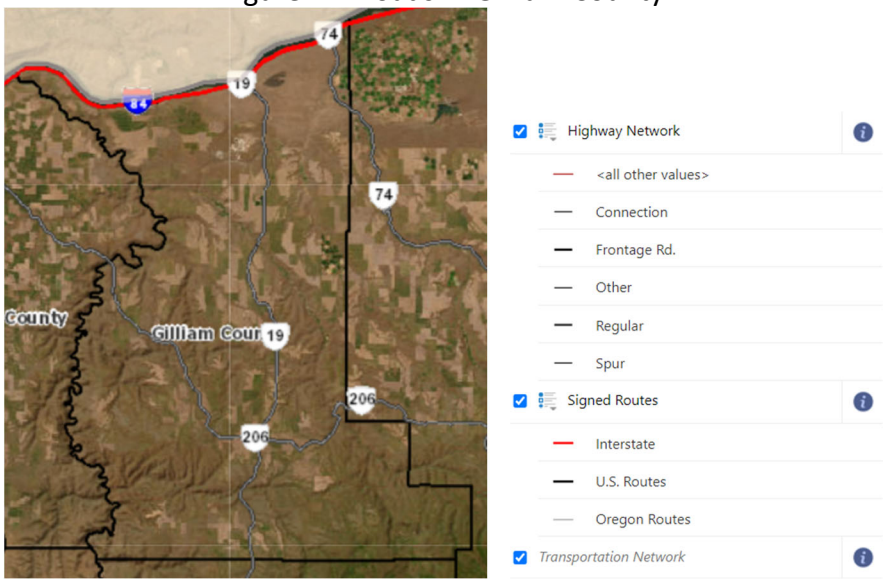
Lonerock Road, extending from Highway 206 to the city of Lonerock, incorporates the pivotal Lonerock Bridge. This bridge serves as the primary access point to the city and its surroundings. This bridge was replaced in 2021, in accordance with recommendations from the 2015 Gilliam County Transportation Plan. The isolated nature of Lonerock is further emphasized by the fact that the Lonerock Bridge represents the sole access route to Condon, situated 21 miles away and approximately 30 minutes of travel time. In the unfortunate event of bridge closure, Lonerock's evacuation options are limited to a 33-mile journey northeast to Heppner, requiring approximately 51 minutes, or a 33-mile trek south to Spray, with an estimated travel time of 64 minutes.

Figure 10: Location of Lonerock Bridge

Source: Google Maps (13)

Interstate 84 presents a large wildfire risk to the county due to the large number of travelers and vehicles along its path, with many fires being started by careless drivers discarding burning waste or pulling an overheated vehicle over into dry annual grasses.

Figure 11: Roads in Gilliam County



Source: Oregon Wildfire Risk Explorer (7)

Railroads

Union Pacific operates a railroad along the Columbia River and the entire Northern boundary of Gilliam County. A spur line connects the Columbia Ridge landfill with the main line through the City of Arlington. The spur line crosses main roads at three locations in the town, and when these crossings are blocked emergency vehicle access, as well as emergency evacuation route access are restricted (14). Fire trucks have been prevented from reaching active fires for up to 15 minutes in the past due to trains traveling through town.

The railroads represent a risk of fire ignition, as Union Pacific maintains gravel immediately surrounding their rail line for about 25 feet on either side from the rail center. The "no man's land" between the gravel under the rails and the embankments surrounding the rail line is overgrown in the City of Arlington with annual grasses, scrub trees, and large amounts of flammable materials. To reduce the risk of ignition, these vegetative fuels need to be managed, and either removed completely or maintained regularly. Multiple parties bear responsibility for this area, including the City of Arlington, Gilliam County, Union Pacific, Watco, and the Army Corps of Engineers. Necessary vegetation management along the railroads will take careful coordination between all these entities.

The railroad tracks along I-84 and between Arlington and Waste Management also serve as an ignition source, with trains periodically starting fires along these tracks. Outside of the town, the vegetation is less dense, and there are no structures in need of protection nearby, therefore the risk is lower than the tracks going through town.

G. Fire Weather

Gilliam County has a history of dry, strong winds, drought, low humidity, a long fire season, and lightning strikes, all factors contributing to its high vulnerability to wildfire.

Winds

Gilliam County has strong, regular winds. The average annual wind speed is 20.05 mph, 4 mph higher than the national average wind speed (15). Wind is the primary force responsible for fire direction and rate of spread. Winds supply the fire with extra oxygen, dry out potential fuels, and can throw embers into the air creating additional fires, as well as thrusting flames upward into tree canopies (16).

Gilliam County is at high risk of agricultural and grass fires, which are normally wind-driven and especially dangerous when winds exceed 20mph (11). Wind-driven fires through crops and grasses move quickly, often at one-third the wind speed, and it isn't abnormal for fires to travel faster than 7mph in steep and rugged agricultural areas, as the average speed for wildfires in the western United States is 14.27 mph (11). At 20 mph of wind speed, fire spreads at 6.8 mph, and over 20 mph it can become difficult for emergency vehicles to stay ahead of the fire and very difficult for firefighters to fight flames directly with water (11).

How wind speed affects fires varies through rangeland depending on the vegetation. In ungrazed areas fire spread speed is 45% of wind speed, in lightly grazed areas it is 36% of wind speed, and in heavily grazed areas fire rate of spread is 18% of wind speed (11).

Figure 12: Wind Speed and Fire Spread Speed

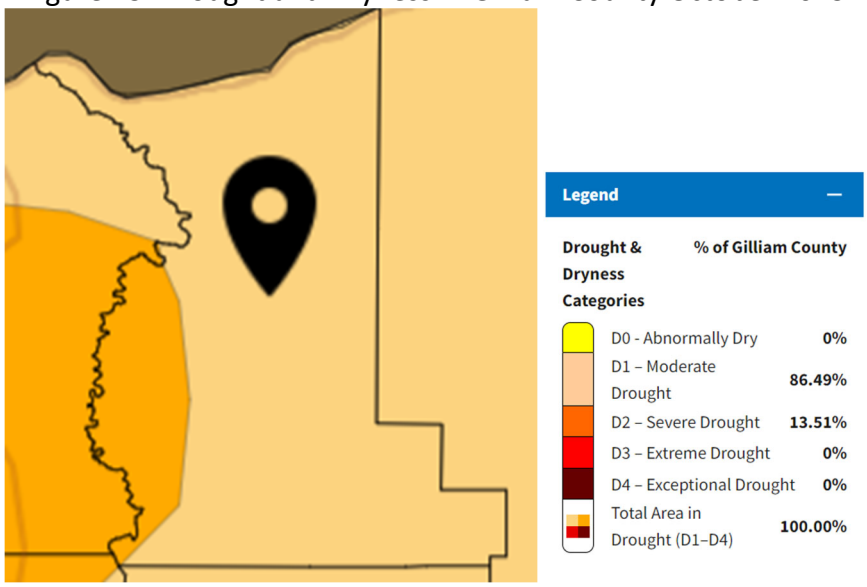
Wind speed	Fire spread speed
20 mph	6.8 mph
25 mph	8.5 mph
30 mph	10.25 mph
35 mph	12 mph

Source: Wildfire Preparedness in Agriculture (11)

Drought

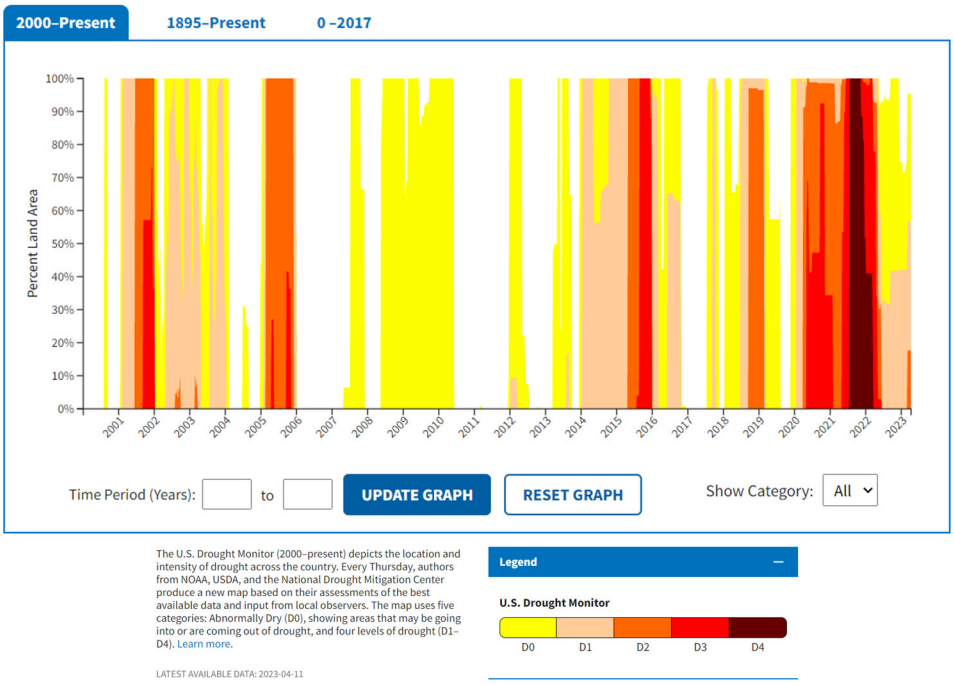
Drought is common in Gilliam County, with a state of drought emergency being declared nine times between 2000 and 2023. As of October 2023, Gilliam County has areas in severe drought and moderate drought. Every citizen in the county is affected by drought, and 2023 is on track to be the 30th driest year to date over the past 129 years (January-April 2023), down 1.5 inches from normal (17). Drought makes environmental conditions more suitable to wildfire, as fuels like grasses and trees dry out and become more flammable, as well as increases the probability of ignition and the rate at which a fire spreads (17).

Figure 13: Drought and Dryness in Gilliam County October 2023



Source: Drought.gov (17)

Figure 14: Historic Drought in Gilliam County, 2000-2023

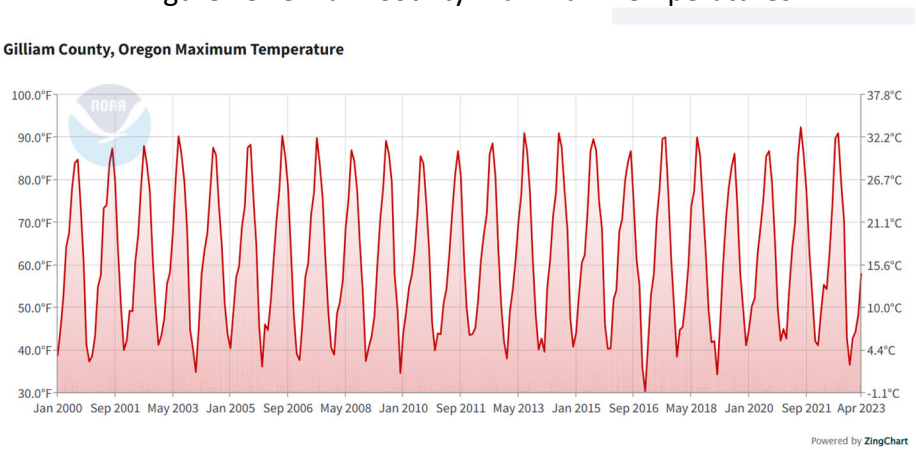


Source: Drought.gov (17)

Temperature and Humidity

Gilliam County experiences warm temperatures throughout the fire season (June through October) with low relative humidity. The normal maximum temperatures in June, September, and October are in the high 70s, while in July and August are near 90 degrees (NOAA). Gilliam County averages about 28 days annually where the high temperature is over 90 degrees, making it hotter than most other Oregon Counties (18). Fires ignite more easily when it is hot outside, and 86°F is frequently the temperature threshold for high fire danger.

Figure 15: Gilliam County Maximum Temperatures



Source: NOAA (19)

Gilliam County also experiences low humidity during the fire season. Average humidity for July and August is 39%, including both day and nighttime humidity (20). Daytime humidity is frequently below 30%, a marker of dangerous fire weather, making ignitions more likely and increasing the rate of fire spread (11).

Figure 16: Monthly Average Humidity in Gilliam County

Month	Average Humidity
January	82%
February	78%
March	71%
April	60%
May	54%
June	48%
July	39%
August	39%
September	46%
October	59%
November	73%
December	82%

Source: Weatherwx.com (20)

Precipitation

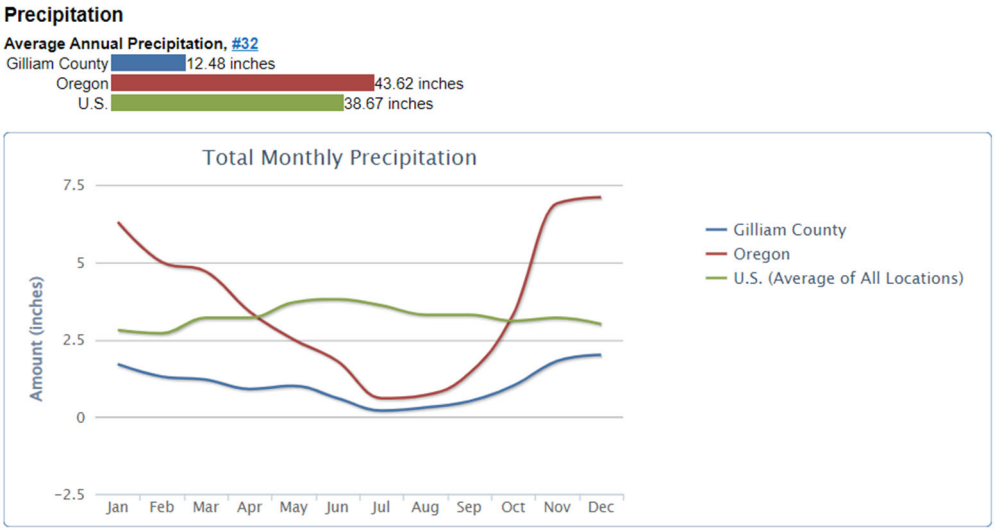
Gilliam County has low precipitation rates, with an average annual precipitation rate of 12.46 inches. Oregon's average annual precipitation is 43.62 inches, and the U.S. average is 38.67 inches. During fire season rainfall is particularly low, with July and August averaging just 0.1 inches, (20). As with drought, low precipitation rates increase the probability that a fire will ignite and increase the rate a fire can spread due to low fuel moisture.

Figure 17: Monthly Average Precipitation

Month	Average Precipitation
January	1.9 inch
February	1.5 inches
March	1.5 inches
April	1 inch
May	1.2 inches
June	0.5 inches
July	0.1 inch
August	0.1 inch
September	0.5 inch
October	1.2 inches
November	1.5 inches
December	2.2 inches

Source: Weatherwx.com (20)

Figure 18: Average Annual Precipitation



Source: USA.com (21)

Fire Season

While fires can take place year-round, Gilliam County's official fire season is June 1st through October 15th. A rule of thumb for determining dangerous fire weather is the 30-30-30 Rule: Relative humidity ≤30%, Temperature ≥30°C (86°F), and Winds ≥30 Kph (20mph) (11). With daytime relative humidity frequently below 30%, temperatures frequently above 86 degrees, and average windspeed at 20 mph, days of high fire danger weather are prevalent June through October, called Red Flag Days. As a result of this, Gilliam County institutes a burn ban in both the north end of the county and the south end of the county. These burn bans are set by the Rural Fire Protection District Chiefs and are enforced by the Gilliam County Sheriff's office which has the authority to ticket violators and issue a monetary fine.

Lightning History

Gilliam County experiences infrequent lighting storms, usually in the summer months when temperatures are high and annual vegetation has cured. Between 1992 and 2019 35 fires were started by lightning that required a joint response, mainly in the south end of the county. Between 2013 and 2022, there were 13 lightning fires that did not require mutual aid out of a total of 18 fires, averaging approximately 1.8 lightning-started fires per year. Lightning fires vary in size and are frequently below 10 acres. Under certain conditions, lighting fires can start in remote locations and will quickly grow to several thousand acres in terrain that is difficult to conduct suppression efforts on.

Climate Change

In 2018 the Oregon Climate Change Research Institute (OCCRI) wrote an on-depth report on Gilliam County created in 2018. They analyzed projections for high and low greenhouse gas

emission scenarios in the 2020s (2010-2039 average) and 2050s (2040-2069 average) compared to the 1971-2000 historical baseline. Under the higher emission scenario for the 2050s, wildfire risk is expected to increase. The number of very high fire danger days per year is expected to increase by 41% (with a range of -15 to +105%) by the 2050s (22).

The risk of wildfire smoke exposure is also expected to increase by the 2050s. The number of days with high concentrations of wildfire specific particulate matter is projected to increase by 93% by 2046-2051 under a medium emissions scenario compared with 2004-2009 (22).

According to OCCRI, temperature is also expected to increase. Under higher emission scenarios by the 2050s the frequency of days with temperatures at or above 90 degrees is projected to increase on average by 33 days (with a range of 14 to 45 days). The hottest day of the year is also expected to be hotter, with a projected increase of 8 degrees (with a range of 3 to 12 degrees) by the 2050s (22).

H. Wildland Fire Fuels

Gilliam County lies in the Columbia River Plateau in north-central Oregon. The vegetation types throughout the county are shrubland, non-native grasses, agricultural land, and minimal conifer forests. Shrubland fuels consist of big sagebrush and bunchgrass, with rabbitbrush or snakeweed. Bunchgrass communities are found along the plateaus and on most of the steep slopes of the river canyons. Non-native grasses include cheatgrass and invasive rye, and these dry, rapid-growing annual grasses are common in areas with high levels of disturbance. Areas that have had fires go through frequently have cheatgrass move in and out-compete native bunchgrasses, replacing well-spaced fuels with fine, flashy fuels that burn hotter and are spaced closely. Agricultural lands are dominated by dry-land wheat, irrigated hay specialty crops, and cattle production. In recent years, there has been an increase in other crops such as canola, wine grapes, and corn for silage (23).

Russian Thistle, commonly known as tumbleweeds, are also prevalent throughout the county. It is an expert at exploiting loose, disturbed soil with little competing vegetation (24). These plants pose a problem due to their tendency to roll across the landscape and accumulate in large groups. They frequently pile against fences and buildings, creating a large dry fuel supply. These are of particular concern to the Montague Solar Farm along Highway 19, which has above-ground servos that can get tangled in tumbleweeds and start fires through friction. Montague has a crew of workers whose responsibility is to clear tumbleweed from the solar equipment to help address this risk.

There are minimal forests, with only 1,538 acres in the southeast corner of the county classified as timberlands with juniper and ponderosa pine (NRCS, 2022). While there are minimal forests, there are large patches of juniper trees located throughout the county. Juniper trees burn hot and fast due to containing volatile organic compounds and are often referred to as “green gas cans.” Juniper trees grow quickly and can outcompete native sagebrush for water. Controlled burns that eliminate smaller trees are good methods of controlling junipers.

Deciduous trees throughout most of the county are sparse and either concentrated around water sources like the John Day River and Rock Creek or have been planted by humans in the cities and around various settlements. Tree types are mainly deciduous, such as Russian Olive, Locust, Sumac, and elm. Trees are not a main source of wildland fuel in the county, but most households in Arlington, Condon, and Lonerock have one to six non-native trees on their property, creating a need for small-scale chipping or tree management programs.

Vegetation Load

In Gilliam County, the distribution of vegetation loads plays a pivotal role in understanding the heightened fire risk, especially in areas near populated regions, critical infrastructure, and key facilities. The nature of these heavy fuel loads contributes significantly to increased wildfire risk. To address this challenge, it is crucial to consider strategies for reducing these fuel loads.

Throughout Gilliam County, large areas are characterized by heavy annual grass fuel loads. This phenomenon is particularly pronounced in regions where human disturbances are prevalent. In such areas, the fuel loads can be substantial, exacerbating the fire risk. However, the most concerning aspect is the presence of thick stands of annual grasses in proximity to cities, buildings, and critical infrastructure. These areas, being at the highest risk, demand immediate attention due to their potential for contributing to extreme fire behavior.

In addition to heavy grass fuel loads, the county also boasts several stands of dense sagebrush shrubland. These shrublands, while ecologically valuable, provide continuous hot-burning fuel, further amplifying the fire risk. Sagebrush-dominated areas, especially those infested with invasive annual grasses are known for their propensity to sustain and spread wildfires, making them a critical component of the fire risk landscape.

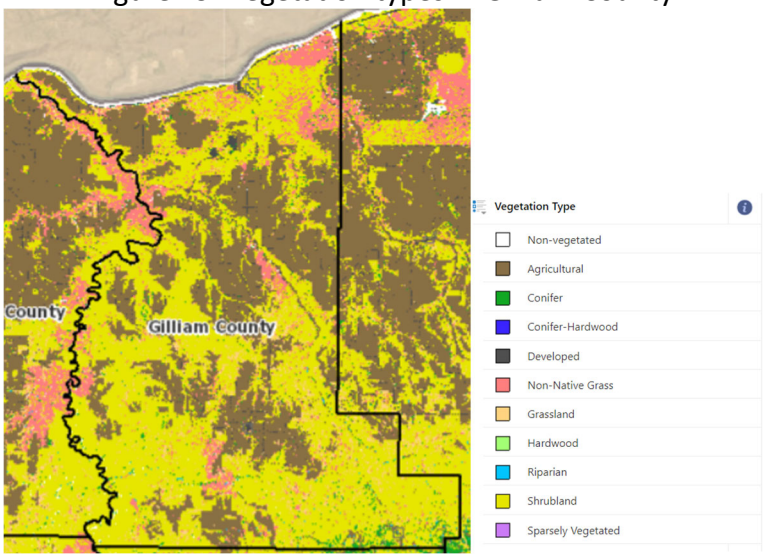
Arlington and its surrounding lands, constituting the wildland-urban interface and intermix zones, exhibit particularly heavy loads of annual grasses. In these zones, the proximity of human habitation and critical infrastructure to wildfire-prone areas elevates the risk substantially. The presence of heavy invasive annual grass fuel loads in these regions necessitates tailored wildfire mitigation strategies to safeguard both lives and property.

In contrast, the City of Condon experiences minimal annual grasses, suggesting a lower fire risk in this specific urban center. Lonerock, while not as heavily loaded as Arlington, falls into the moderate range regarding annual grass fuel loads. Understanding these variations in fuel loads helps tailor mitigation strategies to specific locations.

To address the heightened fire risk associated with heavy fuel loads, strategic measures must be considered. These strategies may include controlled burns to reduce invasive annual grass fuel loads, creating defensible spaces around critical infrastructure, and implementing vegetation management plans in areas with heavy annual grass fuel loads. In the wildland-urban interface areas, community-wide efforts for fire-resistant building practices, maintain defensible space and public awareness campaigns can further mitigate the risk.

Gilliam County's varied vegetation loads have a profound impact on wildfire risk, particularly in areas near populated regions, infrastructure, and critical facilities. Recognizing the distribution of these heavy fuel loads is the first step in developing effective strategies to reduce fire risk and enhance the safety and resilience of the county's communities.

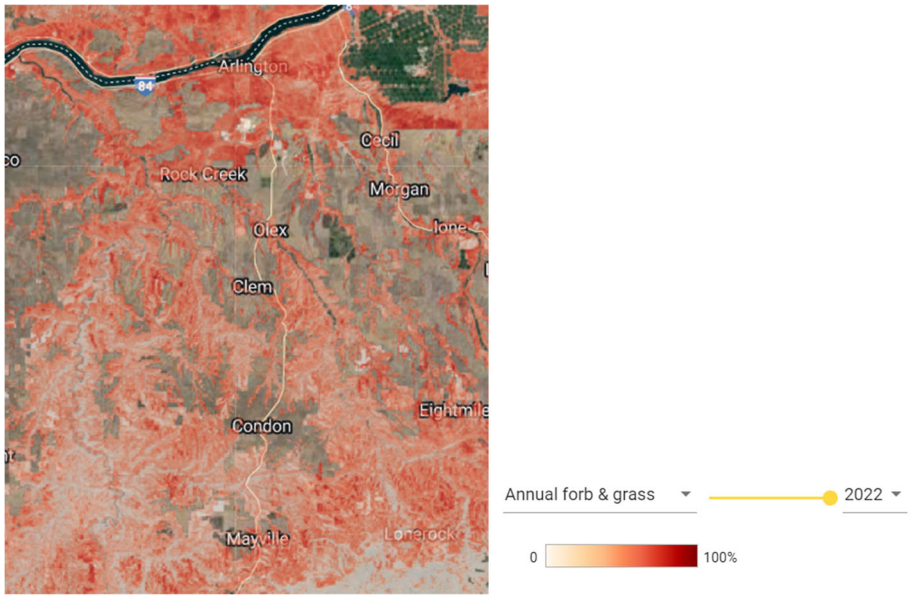
Figure 19: Vegetation types in Gilliam County



Source: Oregon Wildfire Risk Explorer (7)

Arlington and the surrounding lands that comprise their wildland urban interface and intermix zones have particularly heavy loads of annual grasses. The City of Condon has minimal annual grasses, and Lonerock has a moderate amount.

Figure 20: Annual Forbs and Grasses



Source: Rangeland Analysis Platform (25)

Fuel Breaks

Gilliam County currently has a limited number of established fuel breaks, primarily comprised of the John Day River, Columbia River, road systems, and railroad tracks. The effectiveness of these existing fuel breaks varies based on their locations and maintenance. While these natural features, such as rivers and roads, can act as significant firebreaks during wildfire events, they may not cover all areas with high fire risk.

Furthermore, the county's strong agricultural base contributes to the presence of fallow fields and areas with little vegetation, which, although not designated as fuel breaks, can serve as minor fuel reduction locations. These areas are often plowable with a disk plow, creating fire lines during wildfire suppression efforts.

Maintenance of these natural and agricultural fuel breaks is a challenge. The Soil and Water Conservation District (SWCD) does not have a formal program for maintaining fuel breaks but helps farmers and landowners interested in establishing them. An attempt to implement a vegetative fuel break program in the mid-2010s did not garner high participation.

In areas with high fire risk, it is imperative to consider future plans and recommendations for expanding or improving fuel breaks. Several strategies and initiatives are in place or under consideration:

City of Arlington: The city maintains gravel areas around water towers and wastewater systems as fuel breaks. They also periodically establish disc lines around the gun range, serving as a fuel break. However, these declines may not be consistently maintained each year. Recommendations include regular maintenance and expansion of these breaks, especially near critical infrastructure.

City of Condon: The city, bordered by privately owned wheat fields, does not currently maintain any fuel breaks or disc lines. Recommendations include collaborating with landowners to establish fuel breaks near the urban interface to enhance fire protection.

City of Lonerock: With support from the Soil and Water Conservation District (SWCD) and the Natural Resources Conservation Service (NRCS), Lonerock undertook a project to reduce fuel loads by cutting down dense juniper trees. While this project significantly reduced the risk of crown fires, concerns exist about the downed heavy fuels serving as additional fuel loading. Future plans may involve removal or relocation of these downed fuels to minimize fire risk.

Cottonwood Canyon State Park: The park maintains firebreaks around all buildings, including a 5-foot gravel curtain around structures and a minimum of 40 feet of mowed/non-vegetated areas beyond that. Fuel reduction activities encompass the removal of vegetation from trails to enable ranger access to remote areas. Recommendations may include periodic assessments and maintenance of these firebreaks to ensure their effectiveness in protecting park infrastructure and the surrounding environment.

To enhance wildfire resilience and reduce fire risk, it is crucial to engage in a concerted effort to maintain, expand, and improve fuel breaks in areas of high concern. Collaboration among local authorities, landowners, and relevant agencies is key to the successful implementation of these recommendations.

Condition and flammability of landscape fuels

The landscape is dominated by fine flashy fuels in the form of invasive and native annual grasses, shrubland mainly populated by sagebrush, and juniper tree stands spread throughout the county. Due to the size of the county, fuel load varies by terrain. There are areas in the county where the invasive annual grasses are dense, sagebrush shrubland is dense and overgrown, and the highly flammable junipers are thick. In general, despite being overgrown these fuels are healthy, but by their very nature are highly flammable, either due to volatile oils or the annual nature of their life cycle. Focus needs to be on reducing these fuel loads around population centers.

The only exception to general health of fuels is the light scattering of dead and dying trees throughout the county. In locations where old homesteads used to be it is very common to find clusters of 5-10 dead trees. Central Gilliam County experienced a locust borer infestation in the early 2020s, which resulted in the death of several mature locust trees. Since these trees were frequently located near structures, being aware that this is an issue for wildland fire mitigation and response is important. Dead trees of any kind pose a substantial fire risk, but overall, the population of trees throughout the county is so sparse that it is an issue to be aware of but does not have a major effect on most fire mitigation or response efforts.

I. Wildland Fire History

Wildfire Frequency and Flammability Assessment

Gilliam County's landscape exhibits a notable level of flammability, influenced by various factors, including the distribution of fuel types, their susceptibility to ignition, and the historical frequency of wildfires. The county's flammability is closely tied to the presence of distinct fuel types and their distribution. The landscape comprises a significant amount of brush or brush and grass mixture, with 118 recorded fires over the past decade. This type of fuel is highly susceptible to ignition, especially during the dry summer months, contributing to the overall flammability of the county. Additionally, grass fires, accounting for 41 incidents in the same period, further add to the flammability of the landscape. Grasses tend to dry out quickly in hot weather, making them prone to ignition and rapid fire spread.

While not natural fuel types, building and passenger vehicle fires, each with 27 recorded incidents over the past decade, present significant ignition sources that can further exacerbate landscape flammability. These fires often lead to wildland fires when not promptly controlled. Gilliam County experiences a notable number of wildfires annually, with an average of 2.4 large fires per year, predominantly occurring in June, July, or August. The county has a history of

recurrent wildfires, with data from the Northwest Interagency Coordination Center indicating 62 fires requiring interagency responses between 1992 and 2019 (7).

Further underscoring the landscape's flammability, the North Gilliam County Rural Fire Protection District responded to an average of 20 local fires per year between 2013 and 2022, while the South Gilliam County Rural Fire Protection District responded to approximately 10 local fires per year during the same period. These statistics highlight the recurring nature of wildfires in the county. The implications for fire risk in Gilliam County are significant. The landscape's flammability, influenced by the prevalence of combustible fuel types, a history of wildfires, and the frequency of ignition sources, elevates the overall fire risk, especially during the dry and hot summer months. Addressing this heightened fire risk requires proactive mitigation strategies, including vegetation management through controlled burns and the creation of firebreaks, public awareness campaigns to educate residents about fire safety measures, and the strengthening of interagency collaboration to enhance wildfire prevention and response efforts. Monitoring and early warning systems are also critical for timely detection and response to wildfires in their early stages. These efforts are crucial for safeguarding lives, property, and the natural environment in Gilliam County, especially given the region's propensity for wildfires.

Figure 21: Fire Type and Total Number

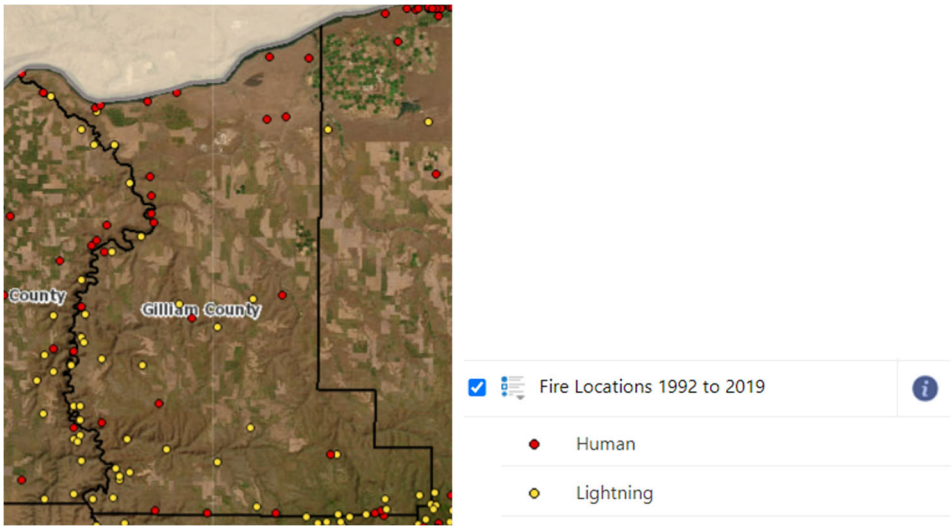
Fire Type	Number of Fires
Building Fire	27
Non-building structure fire	03
Cooking Fire	01
Chimney Fire	03
Trash Fires	02
Mobile Home Fires	07
Passenger Vehicle Fires	27
Road freight/transport freight vehicle fires	10
Rail Fires	01
RV Fires	04
Off Road Vehicle or heavy equipment fires	05
Natural Vegetation Fires	07
Wildland Fires	08
Brush or Brush and grass mixture fires	118
Grass Fires	41
Outside rubbish/dumpster fires	17
Cultivated Grain/crop fires	07

Source: OSFM (26)

Causes of Wildfires and Location

Large fires in Gilliam County are mostly caused by lightning or by humans. Of the 62 fires requiring a joint response recorded by the Oregon Wildfire Risk Explorer, 35 were started by lighting, and 27 were human caused. Human-caused fires happen throughout the county but are predominantly located along I-84 and the John Day River. Lighting fires take place throughout the county but are concentrated along the John Day River and the south end of the county. In Oregon, approximately 70% of wildfires are human caused, the rest being primarily lightning strikes, (11). It is also not uncommon for wildfires to be started by birds or other animals being electrocuted and set on fire by power lines, with 9 fires being started this way between 2013 and 2022. According to data provided by OSFM, between 2013 and 2022, 21 fires were started intentionally, 181 were started unintentionally, 26 were started by failure of equipment or heat source, 16 were an act of nature, 3 have a cause under investigation, 32 have an undetermined cause after an investigation, and 18 fires do not have a cause listed. Mechanical and equipment failures account for approximately 50 starts and are one of the more common methods for fires to be lit.

Figure 22: Multi-Agency Response Fire Locations 1992 to 2019



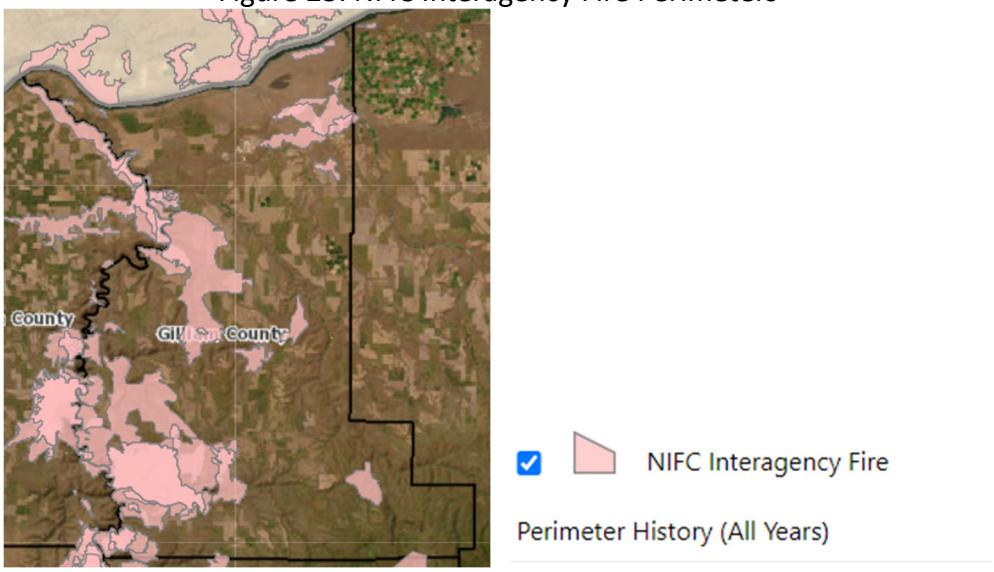
Source: Oregon Wildfire Risk Explorer (7)

Size and Severity of Historic Fires

While most wildfires throughout the county are put out relatively quickly, approximately two per year grow into large fires which require interagency cooperation to extinguish. The largest fire to date in Gilliam County was the Stubblefield Fire in 2018, which burned 54,210 acres. Since 2000, there have been 10 fires that burned more than 10,000 acres, three in 2014 and three in 2018. Despite the large number of acres burned, firefighters and residents have been able to prevent homes burning, and even during these largest wildland fires no homes have been lost. The largest environmental impact tends to be invasive annual grasses returning

quicker than annual bunch grass. There are years when there are more fires, and years where there are fewer with no obvious trend.

Figure 23: NFIC Interagency Fire Perimeters



Source: Oregon Wildfire Risk Explorer (7)

Figure 24: Historical Fires in Gilliam County

Wildfire Name	Year	Acres Burned
Stubblefield 1008 RN	2018	54,210
Seale 1045 RN	2018	23,596
Jack Knife 0440 RN	2018	15,590
Lonerock 1057 RN	2018	5,053
Buckhorn 1018 RN	2018	203
Horn Butte 0594	2017	8,726
0353 RN Scott Canyon	2016	33,587
0561 Rn See Saw	2015	3,006
0139	2015	20
Black Rock Inc 358	2014	35,724
Sniption	2014	25,931
Jack Knife	2014	13,260
Horn Butte	2014	5,319
Spring Hollow	2014	2,993
Inc 0349	2014	257
0501	2012	292
I-0151	2012	16
30 Mile	2011	23,601
Butte	2011	1,949
Misery Flatt	2011	1,388
607	2011	607

0385	2010	4,197
0557 Streese	2010	2,565
0401	2010	391
Green Grass	2009	1,304
Jack Knife	2008	20,114
I_284	2008	9,788
Devils Canyon	2008	403
Incident 621	2007	15,591
North Gilliam	2007	200
Rock Creek	2003	461
Starvation Ridge	2001	6,962
Rock Creek	2001	1,972
Snipton Canyon	2000	6,423
I878	2000	2,845
Harmony	2000	2,340
Rose Briar	2000	2,226

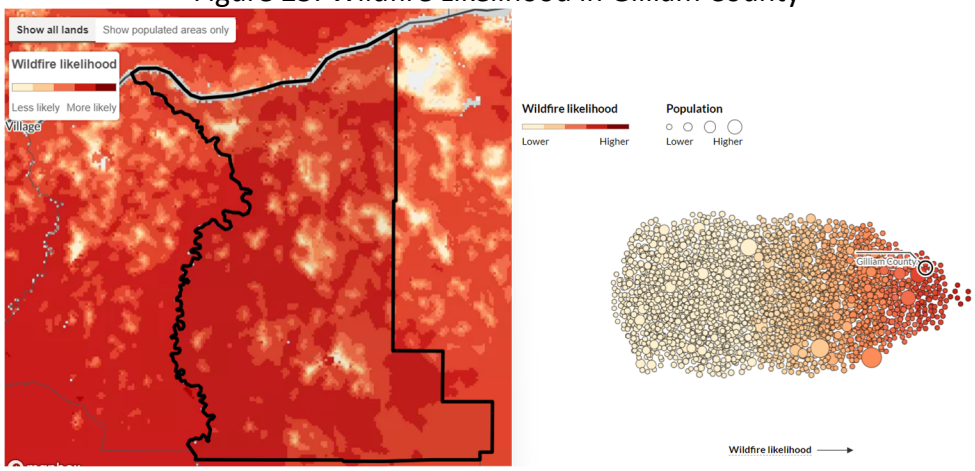
Source: Oregon Wildfire Risk Explorer (7)

J. Wildfire Risk

Gilliam County has a very high risk of wildfires starting and spreading within the community. According to the US Forest Service (USFS), Gilliam County's risk of wildfire is higher than 97% of counties in the United States (3).

Figure 25 shows wildfire likelihood for Gilliam County. It was calculated by the USFS using fire modeling across thousands of simulations that included probability of fire occurring, weather, topography, and ignitions based on variations from recent decades, (3). Wildfire is shown to be more likely than not throughout the entire county.

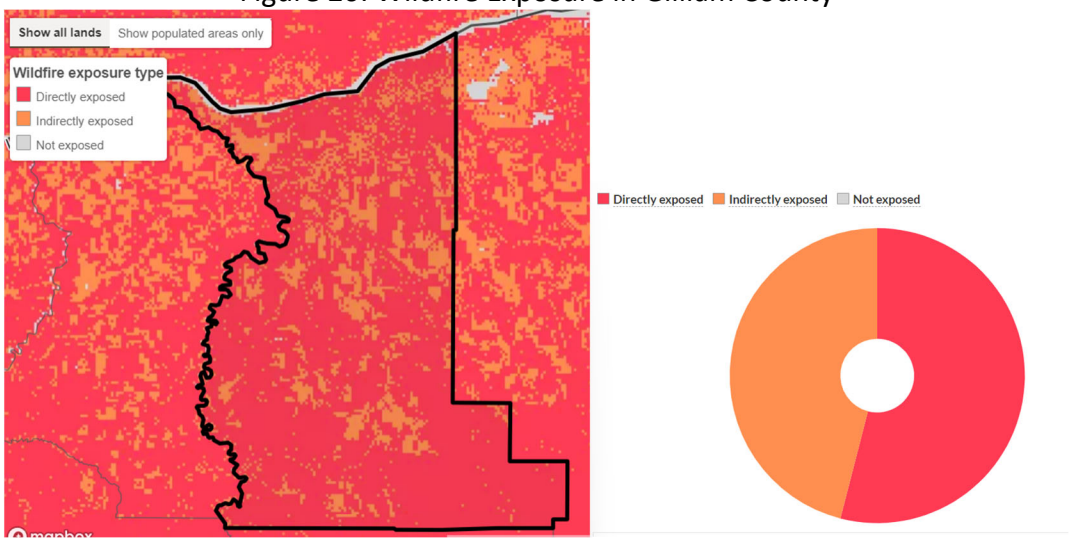
Figure 25: Wildfire Likelihood in Gilliam County



Source: USFS (3)

The chance of a wildfire starting is high, as well as the chance of that wildfire spreading. Gilliam County has a high rate of wildfire exposure, with the entire county being directly or indirectly exposed to wildfire. Exposure, as defined by the USFS is “the intersection of wildfire likelihood and intensity within communities. Communities can be directly exposed to wildfire from adjacent wildland vegetation, or indirectly exposed to wildfire from embers and home to home ignition,” (3). In Gilliam County, 100% of the population is exposed, 54% indirectly, and 46% directly.

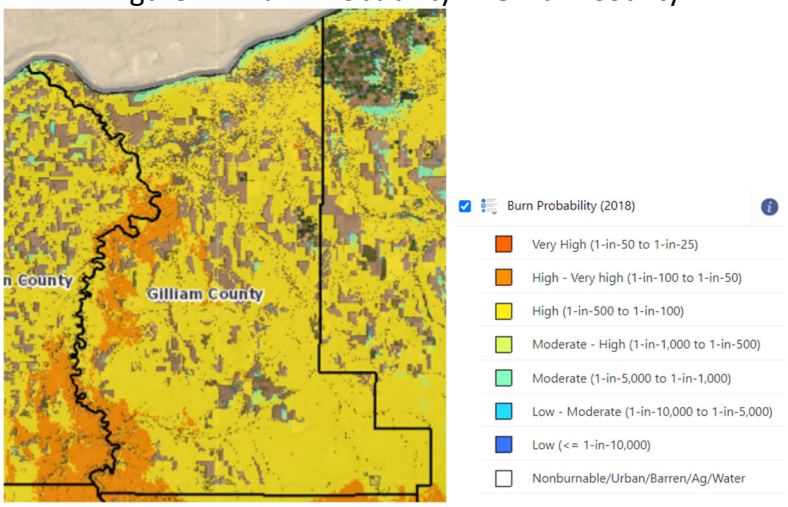
Figure 26: Wildfire Exposure in Gilliam County



Source: USFS (3)

This information is backed up by the State of Oregon Wildfire Risk Explorer, which shows most of Gilliam County with a high burn probability; with areas of high-very high, and a few small areas of moderate-high.

Figure 27: Burn Probability in Gilliam County

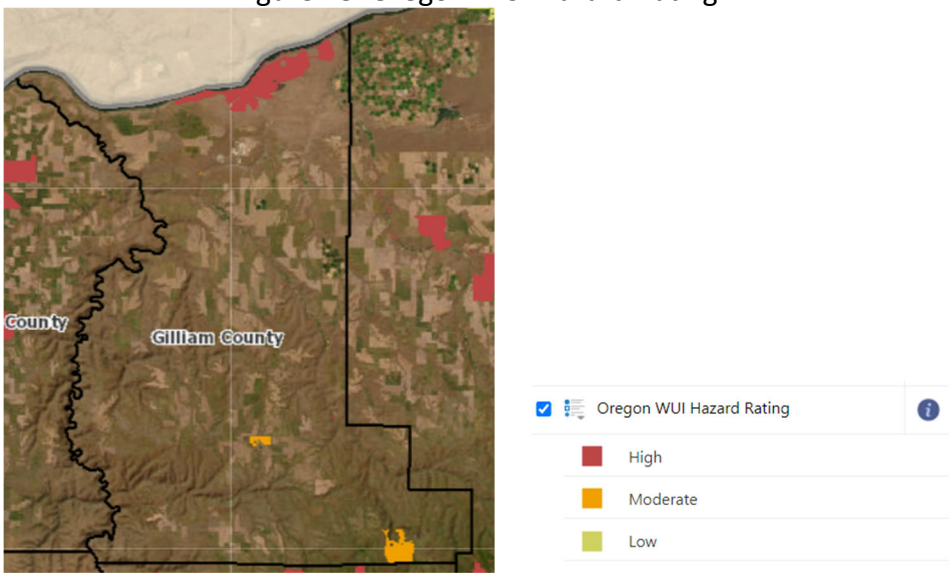


Source: Oregon Wildfire Risk Explorer (7)

WUI Rating

According to FEMA, the Wildland Urban Interface is “The transition between unoccupied land and human development,” (27). Gilliam County has three official Wildland Urban Interface (WUI) zones; the Cities of Arlington, Condon and Lonerock. According to the Oregon Wildfire Risk Explorer, Arlington, and its surrounding area, including its urban growth boundary (UGB) zone have a high WUI hazard rating, while Condon and Lonerock and their surrounding UGBs have a moderate WUI hazard rating. Factors contributing to Arlington’s high rating are invasive grasses, high number of mobile homes, proximity to ignition sources such as I-84 and elderly population. While Condon and Lonerock are further from mutual aid, they do not have the dense vegetation in and around their homes like Arlington does. This implies that Arlington should have a greater focus on vegetation management than Condon and Lonerock, as vegetation management will have a greater positive impact.

Figure 28: Oregon WUI Hazard Rating



Source: Oregon Wildfire Risk Explorer (7)

Local Observation

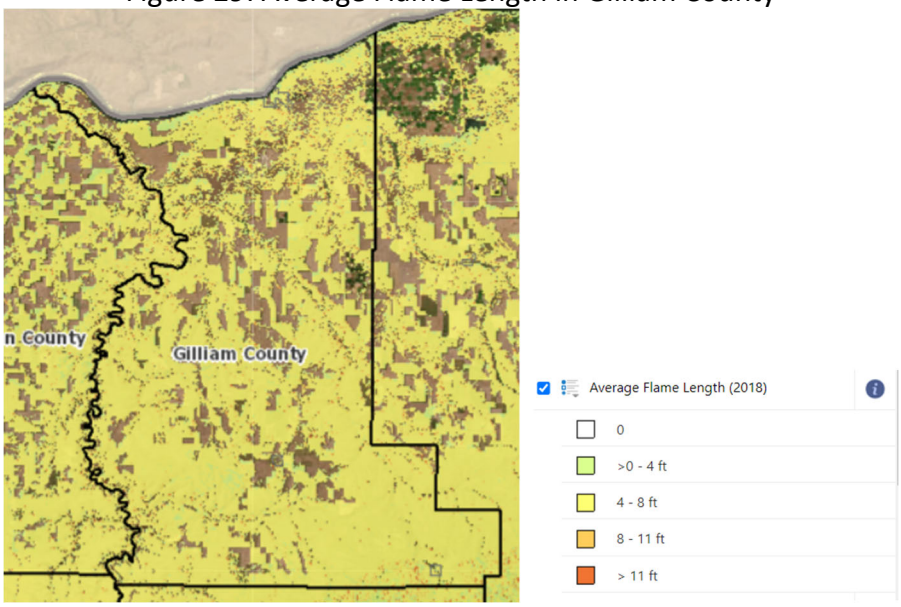
This simulation data is also backed up by local observation and results. Gilliam County averages 30 wildfires per year. Most are smaller and quickly put out by local fire agencies, but a few grow into large fires. NGRFPD averages 20 fires per year, and SGRFPD averages 10 fires per year, which contributes to the local view that Arlington is at a higher wildfire risk than Condon or Lonerock. The Oregon Department of Forestry has assessed Arlington as having a high WUI hazard rating, which aligns with local observation. Arlington was built in a valley with most of the community on steep slopes, surrounded by steep slopes of undeveloped pasture and wildland that is difficult to defend and heavily populated by invasive annual grasses. Arlington is also located along I-84 which has been shown to be a high ignition risk. ODF assessed Condon as having a moderate WUI hazard rating, which aligns with local observation. Condon is located on relatively flat land and is surrounded by farmland, giving easy access to the entire perimeter of

the town for wildfire defense purposes. Lonerock was also assessed by ODF as having a moderate WUI hazard rating. It is surrounded by farmland and while in the bottom of a canyon is relatively flat with a low population density.

Fire Behavior

In the event of a fire, the average flame length is predicted to be four to six feet. Fires in Gilliam County are predominately wind driven grass and brush fires and can spread very quickly. With the average wind speed of 20.05 mph, fires frequently travel at 7mph or faster, and 7mph is the threshold for when they become difficult to control (11). Gilliam County also has many slopes, frequently more than 40%. For every 20% slope increase, the rate of spread of a fire doubles, and flame length increases by half.

Figure 29: Average Flame Length in Gilliam County



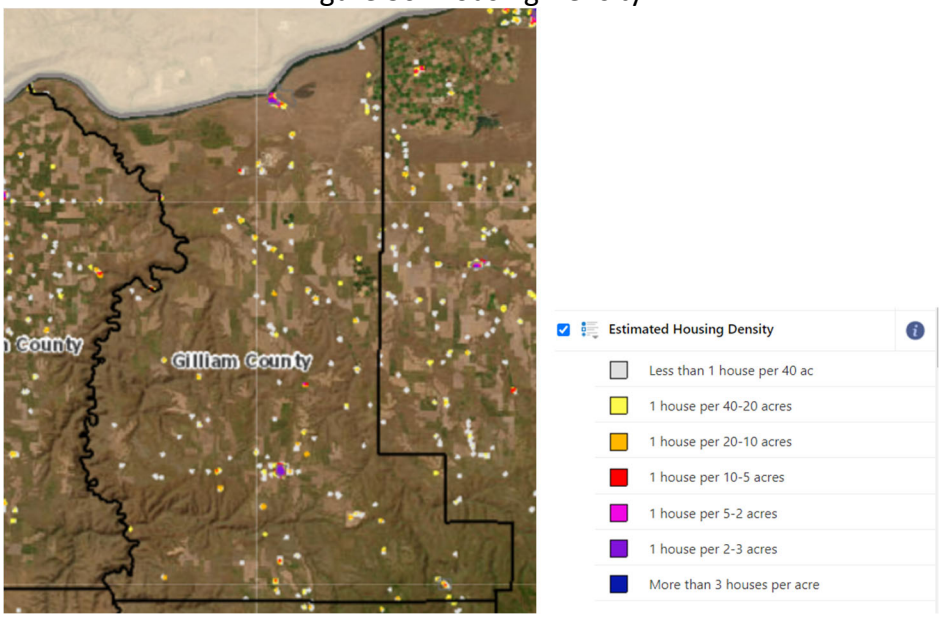
Source: Oregon Wildfire Risk Explorer (7)

K. Building Stock

Housing density throughout the county is .90 houses/square mile. While the overall housing density is low, most homes are located close to one another in one of the three incorporated cities. Throughout the county there is a mix of older and newer construction. Most roofs tend to be asphalt shingle or metal (fire resistant), and there are very few wood shake roofs (extremely flammable). Most housing units in Gilliam County are single family homes or mobile homes. There are a small number of multiple family dwellings, mainly in the form of duplexes. Condon has an assisted living/nursing home, Summit Springs, with 23 retirement center apartments and 6 duplex/fourplex cottages. Arlington has a senior living facility, Columbia Hills Manor, with 8 units. Mobile homes and trailer homes are located throughout the county, with a concentration in the Arlington Trailer Park and the Condon Trailer Park.

Gilliam County has multiple homesteads comprised of new and old houses, frequently with multiple outbuildings. While the homes may have fire resistant roofs and defensible space, it is very common for the outbuildings to be made of wood, consist of older construction, and butt up against dense annual vegetation, all factors contributing to higher vulnerability to wildfire. It is not abnormal for there to be one home, surrounded by 5-10 additional outbuildings, frequently made of wood. There are also multiple historic landmarks throughout the county that are surrounded by dense vegetation and made of wood that are highly vulnerable to wildfires but are of high social value to the community.

Figure 30: Housing Density



Source: Oregon Wildfire Risk Explorer (7)

Housing Characteristics

Older homes tend to have a higher risk of ignition than newer homes, as many older homes were built before the passage of land use planning regulations specifically designed to reduce wildfire exposure to homes. Older homes are more likely to have wooden versus composite siding, as well as wooden roofs versus fire resistant asphalt shingle or metal. It is also more common for newer homes to be built with fire-resistant materials and incorporate improved building standards (3).

In addition to the physical characteristics of homes, occupancy characteristics such as renters, seasonal homes, recreational homes, vacant homes, and homes used for temporary workers can complicate wildfire risk reduction strategies, specifically education efforts for reducing risk in the home ignition zone. Dwellings with higher occupancy rates, such as duplexes, fourplexes, and apartments also have greater risk than single-family homes and may require more complex mitigation efforts. Home hardening, through actions such as updating to fire resistant roofing or siding, is a very effective strategy for reducing wildfire risk, however, this action must be taken by the property owner, as renters do not have the authority or responsibility of updating the

home. Home hardening can also be very expensive, so early education efforts and community outreach are important so that if a homeowner is making large updates, they take fire resistant construction techniques into account.

The presence of many non-owner-occupied homes may also make it difficult for community leaders to reach homeowners whose support is needed for the passage of land use planning tools, such as landscape ordinances or building codes, that reduce the risk from wildfires (3). Local regulations that encourage property owners to implement mitigation measures can be difficult to pass, therefore community engagement is essential for non-owner occupied homes and is the best chance to reach both renters and homeowners.

Older homes, large numbers of non-owner residents, and empty homes make mitigation difficult and raise an area's risk. Home hardening and creating defensible space around a home are some of the best ways for residents to reduce their wildfire exposure risk. On older homes, replacing wooden roofs, wooden siding, decks, and other home hardening tactics can be expensive, and difficult for owners to afford, or difficult to convince absentee landowners to perform. Defensible space can involve trimming or removing large trees, which non-owning residents do not have the authority to do. Robust public outreach is one of the best ways to overcome these issues, educating homeowners on fire resistant home upgrades years before upgrading is needed, as well as non-owning residents on small-scale vegetation management they can accomplish to improve their defensible space.

Figure 31: Housing Characteristics

Characteristic	Number	Percent of total
Total Housing Units 2021*	1,120	
Occupied	902	80.5%
Vacant	218	19.5%
For Rent	11	1.0%
Rented, not occupied	0	0.0%
For sale only	14	1.3%
Sold, not occupied	0	0.0%
Seasonal, recreational	69	6.2%
For migrant workers	7	0.6%
Other vacant	117	10.4%
Year Built		
Built 2010 or later	18	1.6%
Built 2000 to 2009	114	10.2%
Built 1990 to 1999	172	15.4%
Built 1980 to 1989	43	3.8%
Built 1970 to 1979	103	9.2%
Built 1940 to 1969	358	32.0%
Median year structure built	1958	

Source: USFS (3)

Figure 32: Housing Type Summary

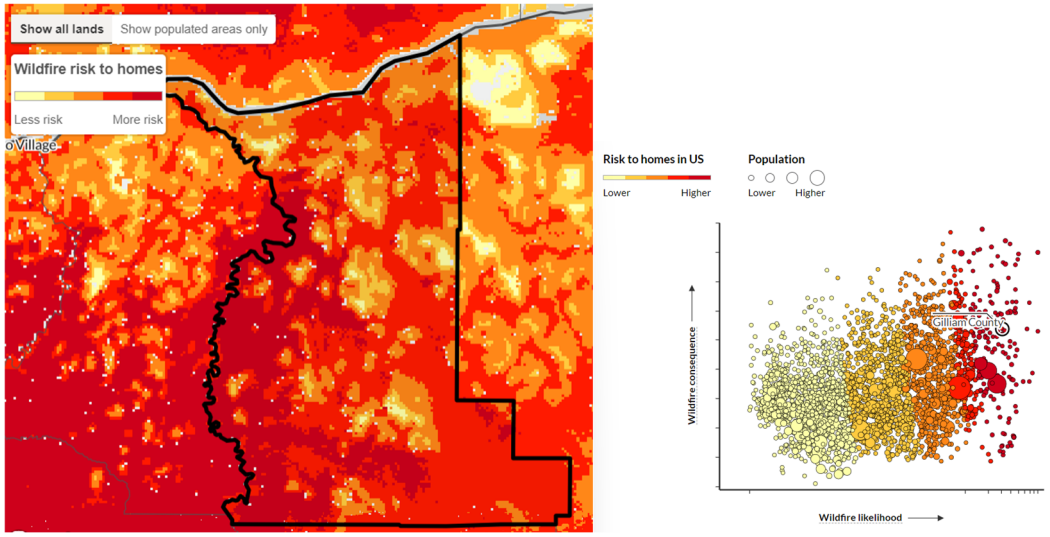
	Number	Percent
1 unit	850	80.9%
2 to 4 units	21	2.0%
5 to 9 units	5	0.5%
10 to 19 units	8	0.8%
20 or more units	17	1.6%
Mobile home	171	18%
Boat, RV, van, etc.	4	0.4%

Source: US Census Bureau (2)

In Gilliam County, the USFS has calculated the wildfire risk to homes as 97% higher than other counties in the US. Wildfire risk to homes is a combination of the likelihood of a wildfire with the expected fire intensity from wildfire simulation modeling, assumes all homes that encounter a wildfire will be damaged and the degree of damage it directly related to wildfire intensity, not considering individual home mitigation activities.

The below map shows where relative risk to homes is and would be, so risks to new construction can also be evaluated (3).

Figure 33: Wildfire Risk to Homes in Gilliam County



Source: USFS (3)

L. Public Safety Response Agencies

Fire

Gilliam County has two Rural Fire Protection Districts. The North Gilliam County Rural Fire Protection District (NGCRFPD) covers Arlington and Northern Gilliam County, and the South Gilliam County Rural Fire Protection District (SGCRFPD) covers Condon, Lonerock and South Gilliam County.

NGCRFPD covers approximately 374 square miles (30.4 percent of the county) while the SGCRFPD covers 788 square miles (64.4 percent). Slightly more than one percent, or 14 square miles, is included in an Oregon Department of Forestry Protection District. These lands are in the southeast of the county and contain the City of Lonerock.

Figure 34. Fire Department Resource List

Fire Department	Number of Volunteers	Firefighting Equipment
NGCRFPD	Approximately 12	- Four brush vehicles
		- One tender
		- One structure engine
		- One tender rescue engine
		- 10 SCBAs
		- One SCBA compressor system
		- Extrication tools, generators, scene lights, other miscellaneous tools, hose, and equipment
SGCRFPD	17	- One structure engine
		- One pumper/tender
		- Two water tenders (one 3,000 and one 4,000-gallon capacity)
		- Seven wildland apparatus (one used as a rescue rig)
		- 10 SCBAs
		- One SCBA compressor system
		- Extrication tools, generators, scene lights, other miscellaneous tools, hose, and equipment

Gilliam, Umatilla, and Morrow Counties are under the Area 9 Fire Defense Board, which also includes the Umatilla National Forest. This gives Gilliam County agencies access to firefighters and equipment from all the agencies in both Umatilla and Morrow Counties and the Umatilla National Forest. Gilliam County also maintains a mutual aid agreement with Sherman County.

Gilliam County has a mutual aid agreement with the Bureau of Land Management (BLM). It is a Mutual Aid Cooperative Fire Protection Agreement between Rivers Division, Oregon Fire Management Service (Prineville District-BLM), and Sherman, Wasco, Gilliam, and Wheeler County Fire Protection Districts. The agreement was established in 2006 and is still valid as of 2023.

The several mutual aid agreements Gilliam County is party to greatly increase the County's capacity. North and South Gilliam Rural Fire Protection Districts frequently send personnel to each other's fires, and several times a year resources from Morrow and Umatilla deploy to assist

Gilliam County. Without this valuable assistance, Gilliam would be unable to control large-scale fires as effectively as they do.

There are also verbal cooperative agreements with the County Road Department to supply road graders and bulldozers for fire suppression activities. The County Road Master will frequently bring a road grader or dozer to an active wildfire and install fire breaks for the Fire Protection Districts.

Emergency Medical Services

North Gilliam County Health District

North Gilliam Medic has one full-time paramedic. They also have 8 volunteers, including a designated ambulance driver. They have one ambulance, and one emergency medical response truck.

Arlington has one clinic in the form of the Arlington Medical Center which provides family healthcare by appointment but does not provide emergency or trauma care.

South Gilliam County Health District

South Gilliam Medic has 20 volunteers, who are all certified Advanced Life Support (ALS) intermediate. They have two ambulances and can respond to a wide range of emergencies. Condon has one clinic, the South Gilliam Health Center that provides family healthcare but does not provide emergency or trauma care.

Air Ambulance

Life Flight Network provides air ambulance services in Gilliam County for critical medical evacuations. Life Flight is a not-for-profit patient transport service providing helicopter, fixed-wing, and ground ambulance transport services, and prioritizes placing lifesaving air medical resources in rural communities. Life Flight Network's aircraft are staffed 24/7/365 with board-certified registered nurses, paramedics, or registered respiratory therapists (28).

M. Community Service Organizations

Community Service Organizations in Gilliam County include the Condon Arts Council, Pioneer Community Development Corporation, the Environmental Sentry Corp, Arlington Lions Club, Gilliam County Historical Society and Arlington Youth Athletics.

The Condon Arts Council "strives to increase exposure to the arts for all ages in our frontier rural community by providing opportunities for arts education and creative expression," (29).

Pioneer Community Development Corporation "was established to help meet the demand for housing in rural Gilliam County. With a growing workforce and reignited economy, the purpose of our program is to improve and increase the availability of quality housing in Gilliam County towns of Condon and Arlington," (30).

The Environmental Sentry Corp is a 501 3(c) run by the Port of Arlington. Its purpose is to serve as a vehicle for brownfield remediation, asbestos cleanup, and environmental remediation of properties throughout Gilliam County.

The Arlington Lions Club's motto is "help where help is needed – in our own communities and around the world," (31). In Arlington, the Lions help support community events, including community breakfasts and school events.

None of the local community service organizations are focused on emergency response or recovery. They all provide services to enhance the well-being and resilience of Gilliam County, through housing, the arts, and acts of service.

A community service organization that Gilliam County has begun developing a relationship with is Team Rubicon, "a veteran-led humanitarian organization that serves global communities before, during, and after disasters and crises," (32). Team Rubicon is interested in performing fire mitigation work in Gilliam County.

While the county is aware of the Red Cross and other larger community service organizations that could aid in the event of a large-scale disaster, Gilliam County does not maintain a regular relationship with them. The Red Cross is a member of the Area 9 Fire Defense Board and will attend meetings semi-regularly as they have an ongoing relationship with Morrow and Umatilla Counties, however, this is the only association Gilliam has with them.

N. Recreational Areas

Gilliam County has a small number of designated recreational areas, but they are all located in high-risk terrain. These recreational areas attract a high volume of people and associated ignition sources during the summer, with most tourists visiting the county from June through September. This corresponds to Gilliam County's established fire season of June through October (11). Due to the small size of the county, when tourist numbers are calculated Gilliam County is combined with Sherman County. These counties host 138,110 overnight visitors annually (33). While not all these visitors travel to recreational areas, many of them do.

Cottonwood Canyon State Park

Cottonwood Canyon State Park spans 16 miles of the John Day River and contains 8,000 acres between Gilliam and Sherman County. On the Gilliam County side of the Main Park complex, there is the J.S Buress Boat Launch and the Lost Corral Trail, which consists of a 4.3-mile one way (hiking, horse, and mountain bike) trail (34). Backcountry camping is allowed beyond 1 mile from any park trailhead, this includes the BLM Land surrounding the park and Starvation Lane, which are managed by Oregon Parks and Recreation Department.

Cottonwood Canyon is open to hunting outside of developed areas, and the park sets burn bans in partnership with BLM and Sherman County Emergency Services. While their website specifically states no campfires, wood fires, tiki torches, candles, and other fire sources, they are

still at an elevated fire risk from tourists who are either unaware of the burn bans or chose to ignore them. The entire park has extremely poor cell phone coverage, with Wi-Fi only available on the Sherman County side at the park's visitor center and cabins, making reporting any fire starts extremely difficult.

According to Park Rangers, Cottonwood Canyon State Park receives 25,941 cars per year, roughly 51,882 people and the JS Burress Park receives 27,686 cars per year, roughly around 55,372 people (35). The park attracts a large number of seasonal visitors, and the steep terrain of the John Day River Canyon often reaches slopes of over 40%. Combining this with large amounts of invasive annual grasses, sagebrush, and lack of cell phone coverage, Cottonwood Canyon is an area that will have complicated response efforts and is very high risk.

30 Mile Boat Launch on the John Day River at the Armstrong Access Area

BLM manages 11,149 acres along Thirtymile Creek and Armstrong Canyon, including the lower stretch of Armstrong Road which provides access to the John Day River. This river access point has a primitive boat launch and ample parking. The road is closed seasonally from December 1 to April 15 for deer and elk wintering. Additionally, this park allows primitive camping and campfires. Along the river corridor, campfires are only allowed in firepans outside of fire season, June 1-September 30 each year (36). BLM sets their own burn ban restrictions, but it is very common for them to coordinate with local jurisdictions, and they commonly have the same restrictions as the county they are located in.

McDonald's Ferry at the mouth of Rock Creek

McDonald's Ferry Ranch is located seven miles downstream from Cottonwood Canyon State Park. It is 4,097 acres and spans 3.2 miles of the John Day River and 2.6 miles of Grass Valley Canyon Creek. It is largely native grassland and sagebrush, through the steep John Day River Canyon with limited access. This area is highly popular as a boat pull-out for floaters down the John Day River who put in at Cottonwood Canyon State Park. The increase in traffic represents an increase in risk to people and the land during the wildfire season. It Is owned by the Western Rivers Conservancy (37). Western Rivers Conservancy is a 501(c)3 organization and must follow local rules and regulations. All land owned by them follows Gilliam County burn ban regulations.

The entire John Day River Area

The John Day River is one of the longest free-flowing rivers in the continental United States and does not have any dams for 281 miles. The water flow fluctuates throughout the year depending on snowpack and rainfall. Non-motorized and motorized boat access is open seasonally, increasing the river's appeal as a tourist destination. The John Day is surrounded by steep cliffs carved into basalt that have extremely steep, sometimes near vertical slopes (38). Sagebrush and annual grasses dominate the vegetation around the river, with scatterings of willow, locust, Russian olive, and other small trees. There is poor reception/connectivity

throughout the entire John Day Canyon, making it difficult for people to report fires and other emergencies, as well as complicating response efforts.

O. Unincorporated Communities

In addition to recreational areas and three incorporated Cities, Gilliam County is home to several unincorporated communities that were once small towns. These communities are now comprised of three to ten homes and multiple outbuildings. They are extremely isolated and a minimum of 15 minutes' drive from any response assets. These communities include Mayville, Clem, Mikkalo, and Olex.

Mayville is located 12.1 miles (15 minutes) south of Condon along Highway 19. There is an auxiliary fire station for SGCRFPD located here, but it does not currently have any fire trucks or supplies and is used for storage due to a lack of personnel in the area. If someone from Mayville joins SGCRFPD or if a Firefighter moves there, a fire truck may be potentially located there during fire season. Mayville has several overgrown trees and old wooden buildings throughout their community of 10 houses which present a fire risk. They are surrounded by rolling hills and farmland and in the event of a fire threatening the community a volunteer farmer would be able to plow a disc line around the area.

Olex is an area of concern due to its isolation, it is located 16.9 miles (20 minutes) from Arlington and 21.7 miles (26 minutes) from Condon. Olex is in the bottom of a steep canyon and has limited to no cell phone coverage and little to no VHF radio coverage, making reporting fires difficult and increasing the complexity of fire suppression. Highway 19 through Olex is bordered by thick stands of sagebrush and invasive annual grasses on steep hills, making this area's fire hazard very high.

Clem is 16.3 miles (20 minutes) from Condon and 23.6 miles (28 minutes) from Arlington. There are three homes in Clem and multiple wooden outbuildings, including a historic one-room schoolhouse. Clem is surrounded by dryland grain fields and is populated by farmers. In the event of a large-scale fire, residents would be a long way from assistance, but a disc line would be able to be installed relatively easily around the entire settlement by a farmer volunteer.

Mikkalo is 20.5 miles (25 minutes) from Condon and 21.3 miles (26 minutes) from Arlington. Mikkalo has a grain elevator that is operated by Mid-Columbia Producers, two occupied homes, and multiple outbuildings. Mikkalo is bordered by wheat fields and rangeland. In the event of a large event, a decline would be able to be plowed around the two homes, and the grain elevator is surrounded by gravel with minimal vegetation.

Community outreach for fire prevention is essential in these smaller communities, as due to their isolation they will be largely responsible for the initial response in the event of a wildfire, either through initial response actions they take during a fire or mitigation actions they have taken ahead of time to prepare their homes and communities. In the event of evacuation, Clem and Mayville residents would normally be directed to Condon, Olex residents would normally

be directed to Arlington, and Mikkalo residents would be directed to either city, depending on the location of the fire.

P. Energy Development Projects

Gilliam County is a leader in the state for renewable energy, hosting several wind farms and solar farms. Increasingly, these energy development projects are taking place on agricultural lands, adding potential ignition sources during the fire season.

Solar Farms

Solar farms represent a unique fire risk to Gilliam County. While the solar panels themselves are extremely flame resistant, the motors that turn the solar panels are at high risk of becoming entangled with weeds, especially Russian thistle (tumbleweeds) and igniting due to friction. As of May 2023, there have been three fires at solar junction boxes that house the turning mechanisms for the solar panels. Annual weeds become wrapped around these mechanisms and create a fire hazard through friction. The solar farms are responsible for managing weeds within their boundary, and within 10 feet outside of their fences. Additionally, in 2022 two fires were started (and quickly controlled) by wiring that combusted during several days of red flag warnings.

Currently there is only one solar farm operating in Gilliam County, Pachwaywit Fields, commonly referred to as Montague Solar Facility. It is a 162MWac facility that occupies 1,189 acres (1.9 square miles) in Central Gilliam County. They currently employ seasonal and full-time staff to keep up with vegetation management concerns. Montague Solar Facility maintains a fire prevention plan on file with the NGCRFPD Chief, Gilliam County Emergency Manager and Oregon State Fire Marshal.

As of June 2023, an additional solar farm has been approved and planned for construction, the Oregon Trail Solar Facility. It is planned to include up to 400 acres of solar photovoltaic energy equipment on 1,228 acres solar micro siting area (39).

Wind Farms

Gilliam County is home to thirteen wind power facilities under review or operating, with a total of 790 wind turbines. These wind turbines produce nearly 2,000 megawatts of electricity, and pose a unique wildfire risk, as they can spark wildfires and spread embers over large distances. In July 2018, a 2,000-acre wheat and rangeland wildfire was started near Arlington by a malfunctioning wind turbine (11). In 2023, two wind turbines caught fire, but neither sparked a larger wildfire. When a wind turbine ignites, the main tactic for both rural fire protection districts is to locate manned engines near the base of the tower and wait for the turbine to burn out, extinguishing spot fires that begin based on sparks or embers. Due to the size of the turbines, extinguishing the fires from the ground is impossible. While wind turbines are generally considered safe, research from the International Association for Fire Safety Science states that 1 in every 1,710 wind turbines will catch on fire annually (11).

Figure 35: Renewable Energy Facilities in Gilliam County

Project Title	Type	Turbines/Panels	Capacity	Operating Status
Montague Wind Power Facility	Wind	56	201 mW	Operating
PacificCorp Leaning Juniper I	Wind	67	100.5	Operating
Leaning Juniper IIA Wind Power Facility	Wind	43	90.3 mW	Operating
Leaning Juniper IIB Wind Power Facility	Wind	74	111 mW	Operating
Shepherds Flat Central	Wind	116	290 mW	Operating
Shepherds Flat North	Wind	106	265 mW	Operating
Shepherds Flat South	Wind	116	290 mW	Operating
EDPR Arlington Wind Power Project LLC	Wind	49	102.9	Operating
Wheat Field Power Project LLC	Wind	46	96.6	Operating
Condon Windpower LLC	Wind	83	50	Operating
Willow Creek Energy	Wind	18	27	Operating
Oregon Trail Wind	Wind/Solar	16		Proposed
Oregon Trail Solar	Wind/Solar			Proposed
Montague Solar Facility	Solar		162mW	Operating

Source: Oregon.gov

Q. Critical Infrastructure/Critical Facilities and High-Risk Communities

At the community level, critical infrastructure is “assets, systems and networks, whether physical or virtual, that are so vital to the ***community*** that their damage or destruction would have a debilitating effect,” (40). This community definition also includes critical facilities that might not fit the traditional definition of critical infrastructure, but without which a community would suffer greatly. Critical facilities include hospitals, assisted living centers, community shelters, schools, airports, important government offices, emergency operations centers, hazardous materials sites, roadways, railroad (freight and passenger), municipal utilities, large capacity public assembly facilities and events, terrorism soft targets, marine (recreational, passenger, cargo), industrial facilities, agricultural storage and handling facilities, communications systems and high-risk neighborhoods and homes (40).

Gilliam County has several critical facilities, critical infrastructure, and high-risk neighborhoods. Critical infrastructure and facilities have been combined into one list.

Figure 36: Gilliam County Critical Infrastructure and Facilities

Gilliam County Critical Infrastructure and Facilities	
Gilliam County	Address
Bridges (Cottonwood, Le Page, Arlington, Olex, Thirtymile, Lonerock, Upper Rock Creek and Willow Creek)	
Gilliam County Courthouse/Sheriff's Office: Condon	221 S Oregon St, Condon OR
Gilliam County Sheriff Arlington Outpost	1320 Locust St, Arlington, OR
Union Pacific Railroad(s)	Along I-84, Highway 19, and Cedar Springs Road.
Utility Lines (Columbia Basin, Pacific Power and Light)	
Telephone Lines	
Fiber Optic Cables	
Highways (19, 206, 97, 74)	
County Roads	
Interstate 84	
Gilliam County Fair Grounds	602 N Washington St, Condon
Frontier Regional 911	135 S Main Street, Condon
Radio Repeaters	
Gronquist Building Offices	1650 Railroad Ave, Arlington
BPA and CB Power Stations	
Transportation Facility	
ODOT Facilities	406 E Frazer St, Condon Airport Rd, Arlington
City of Arlington	Address
Arlington Elementary School (built 1963)	1400 Main Street, Arlington
Arlington High School (built in 1952)	1200 Main Street, Arlington
Arlington Medical Clinic	120 The Mall, Arlington
City Hall	500 W 1st St, Arlington
North Gilliam Co. Rural Fire Protection District Station	1500 Railroad Ave, Arlington
Wastewater Treatment	50 Plant Rd, Arlington
Water System	
Interstate 84 Access Ramps	
North Gilliam County Medic Ambulance	1200 Cottonwood St, Arlington
City of Condon	Address
Condon Elementary School (built in 2021)	715 S Washington St, Condon
Condon High School (built in 1962)	210 E Bayard St, Condon
City Hall	128 S Main St, Condon

South Gilliam Co. Rural Fire Protection District and EMS Station	220 N Main St, Condon
South Gilliam County Health Center	422 N Main St, Condon
Frontier Regional 911	135 S Main Street, Condon
Water System	
Wastewater Treatment	
City of Lonerock	Address
Lonerock Community Hall	104 Main St, Lonerock
Fire Station/Outpost	
Water System	

Source: Gilliam County Natural Hazard Mitigation Plan Steering Committee, 2023

Figure 37: Gilliam County Vulnerable Populations and High-Risk Neighborhoods

Gilliam County Vulnerable Populations and High-Risk Neighborhoods	
Gilliam County	
Travelers along interstate Highway 84 and State Highway	
Tourists along John Day River and Columbia River and Public Lands	
City of Arlington	
Columbia Hills Manor (Senior apartments)	350 Hemlock St, Arlington
Arlington Childcare Center	1340 E 2nd St, Arlington
Columbia River Motorhome and RV Park	475 Shane Drive, Arlington
Arlington Grade School	1300 Main Street, Arlington, OR
Arlington High School	1200 Main Street, Arlington, OR
Elderly Population	
City of Condon	
Summit Springs Village (Assisted Living Facility)	133 S Church St, Condon
Summit Springs Village Memory Care Unit (Assisted Living Facility)	133 S Church St, Condon
Condon Early Learning Center	311 E Bayard St, Condon
Condon Grade School	715 S. Washington St, Condon
Condon High School	210 E Bayard St, Condon
Elderly Population (median age in Condon is 65)	
City of Lonerock	
Elderly Operation (median age in Lonerock is 64)	

Source: Gilliam County NHMP Steering Committee, June 2023

Chapter 2: Arlington

Chapter 2 contains a risk assessment of Arlington. It contains demographic information, wildfire risk and behavior, access, vegetation, building construction, fire protection, utilities and additional risk factors for the community, and high priority mitigation areas.

Arlington

Arlington is located at the north end of Gilliam County along the Columbia River and Interstate 84. It has a total population of 628 according to the 2020 census, an increase of 104 individuals from 2000. The total number of housing units is 294, with 259 of them being occupied, leaving 35 vacant (41). Of these homes, there is a 69.9% home ownership rate. Arlington's elevation is about 285 feet, and it receives about 9 inches of rain per year (42).

The median household income is $56,944, which is $14,718 below Oregon median income. Despite the low income, Arlington has a 60% employment rate (above state average), with a 9.5% poverty rate (below state average). Primary and secondary education is important to the community, with an 87.6% school enrollment rate; however only 18.5% of the population has a bachelor's degree, compared to the state rate of 36.3% (2).

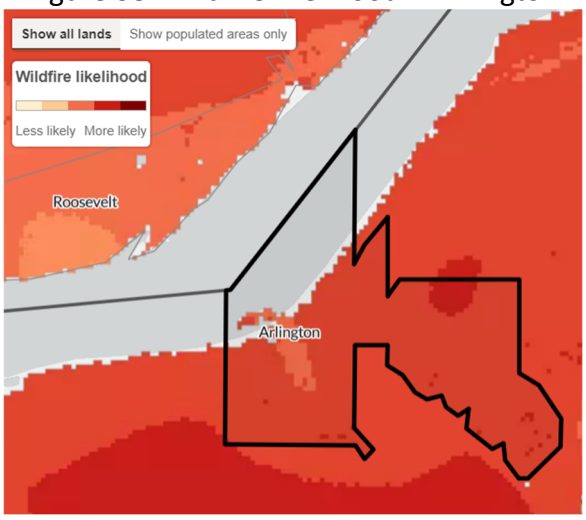
The median age of Arlington residents is 40.6 years old, with 16.4% of the population being 65 years old or older. The average family size is 3.26, and 22.9% of the population is children under 18. Household makeup is: 31.4% married couple family households, 24.3% male householder, no spouse present, family household, and 35.8% is female householder, no spouse present, family household. The disabled population is also relatively high, at 22.3% (2).

Arlington does not have a large amount of racial or ethnic diversity; 542 out of 628 residents identify as white. Other races/ethnicities include 18 American Indian/Alaskan Native, 6 Asian, 48 Hispanic or Latino, 7 native Hawaiian and pacific islander, and 13 some other race according to the 2020 census (2).

A. Wildfire Risk

The City of Arlington has a high wildfire likelihood, with wildfires more likely to start there than in 97% of other locations in the United States (3).

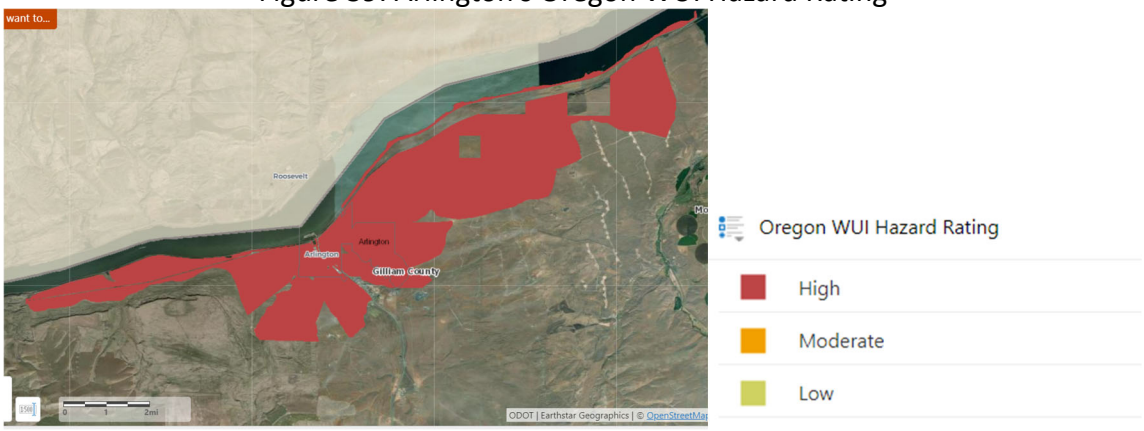
Figure 38: Wildfire likelihood in Arlington



Source: USFS (3)

ODF has also assigned Arlington a high WUI hazard rating, supporting the USFS assertion that Arlington is very likely to experience a wildfire.

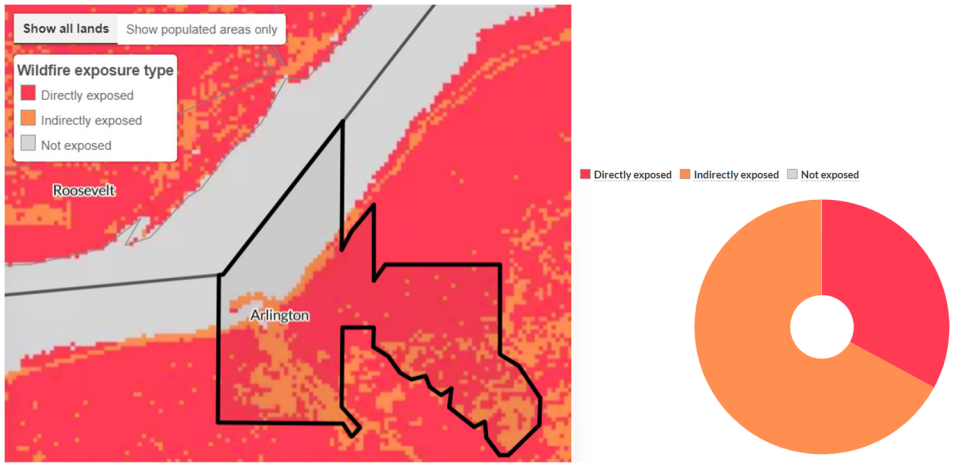
Figure 39: Arlington's Oregon WUI Hazard Rating



Source: Oregon Wildfire Risk Explorer (7)

Arlington has high exposure to wildfire, with 100% of the population being directly exposed or indirectly exposed to wildfire.

Figure 40: Arlington Wildfire Exposure



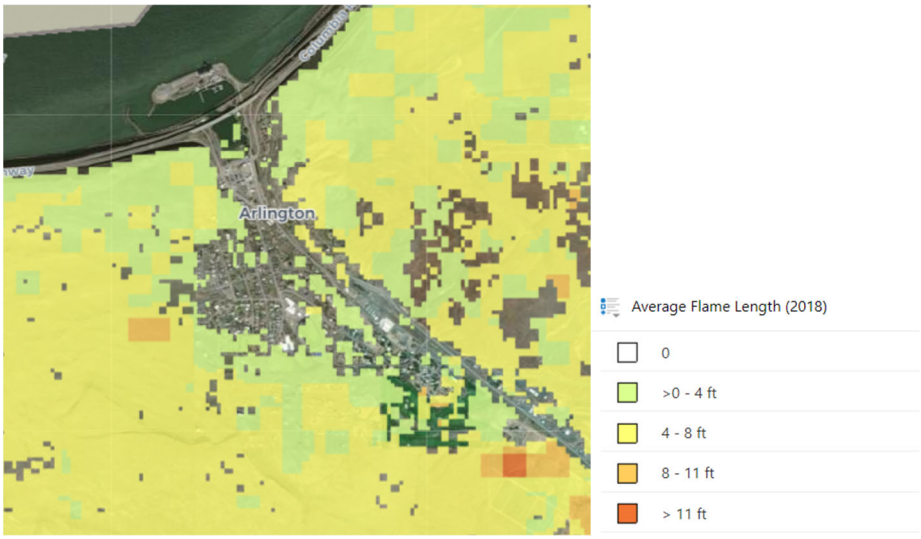
Source: USFS (3)

B. Wildfire Behavior

Wildfires in Arlington are predominately fast-moving wind-driven grassfires. The fuels throughout the WUI are thick invasive annual grasses, domesticated trees, and homes, mainly located on steep slopes. Additionally, due to its location in the Columbia River Gorge Arlington is frequently windy, with wind speeds averaging 20 mph. The average flame length directly around Arlington is 0-4 feet in most areas, with small sections expecting 4–8-foot flame lengths. This is

important to note because flame lengths over 4 feet become difficult for firefighters to suppress with water, and often air resources and firebreaks must be used to stop fires.
All these factors will support a fast-moving fire that could quickly become difficult to suppress. The roads throughout the town will help serve as fire breaks in the event of a large-scale wildfire, however, strategic locations for additional fuel breaks should be determined.

Figure 41: Average Flame Length



Source: Oregon Wildfire Risk Explorer (7)

C. Access

Arlington is built in a valley with steep hillsides and located along Interstate 84. There are three main routes to evacuate the town, I-84 from the east, I-84 from the west and Highway 19 to the south.

Arlington has several neighborhoods that are challenging to access with only one way in and one way out. While there are few one-way streets, there are multiple dead ends in neighborhoods that would be extremely difficult for a fire engine to turn around in.

Columbia View Estates has two access and exit points. Proctor Road enters the neighborhood on the west and exits on the northeast. The streets are wide enough that even NGCRFD's largest structure truck will fit, and most driveways are large and not crowded. Citizens are very understanding of emergency vehicles needing to turn around and allow the use of their driveways for that purpose.

Columbia View Estates is bordered to the west and south by open rangeland, and to the east by the China Creek Golf Course. If the neighborhood needed to evacuate and both exit points were compromised, they would be able to take refuge on the China Creek Golf Course. It is highly likely that residents with trucks would attempt to drive through the range land, and while there

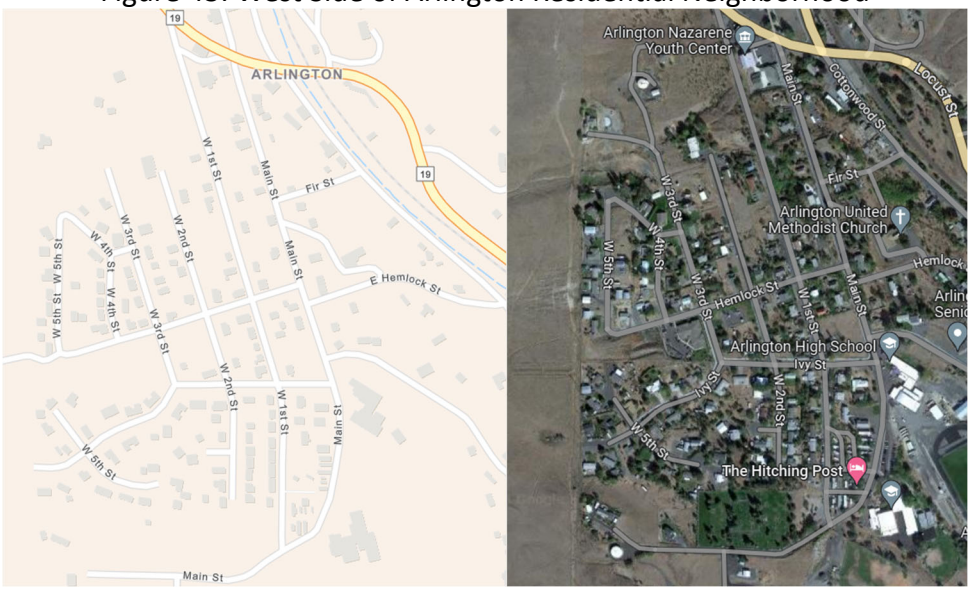
is not a proper road the lack of trees and the density of sagebrush would make this route a possibility.

Figure 42: Columbia View Estates Access Roads

Source: Google Maps (13)

The West side of Arlington is comprised of several dead-end streets. West Hemlock and West Ivy Street run uphill, and more than 6 residential streets dead end off them into narrow, residential areas that would be difficult to turn a fire truck around in or evacuate. There is a windmill road that leads west from Hemlock Street, but it goes through grassland and is a service road through fields. In an emergency, residents could use that extremely rough road to evacuate.

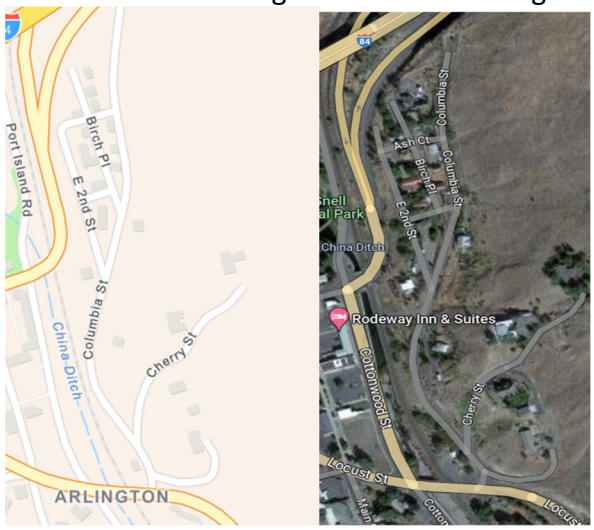
Figure 43: West Side of Arlington Residential Neighborhood



Source: Google Maps (13)

The East Side of Arlington has a small residential neighborhood right above the I-84 East Access Ramp that is one way in or out. It is also completely bordered by heavy loads of annual grasses and highly flammable fine fuels. The streets are narrow, and all of them dead end. Many of the houses are located where an emergency vehicle could turn around the block prior to the dead end.

Figure 44: East side of Arlington Residential Neighborhood



Source: Google Maps (13)

Columbia River RV and Mobile Home Park, locally known as the Lower Trailer Park has one way in or out and is bordered by heavy loads of fine flashy fuels in the form of annual grasses, deciduous trees, construction waste, and large debris items (couches, appliances, etc.). There is easy emergency vehicle access, and plenty of space to turn around, as well as the neighborhood being constructed on a loop. If the road was blocked vehicle evacuation would be difficult, and evacuation on foot could take place through the dense grass. Immediately behind the Trailer Park is the China Creek Golf Course which could serve as a green space evacuation location in the event of a large fire if residents needed to evacuate on foot.

Figure 45: Columbia River RV and Mobile Home Park

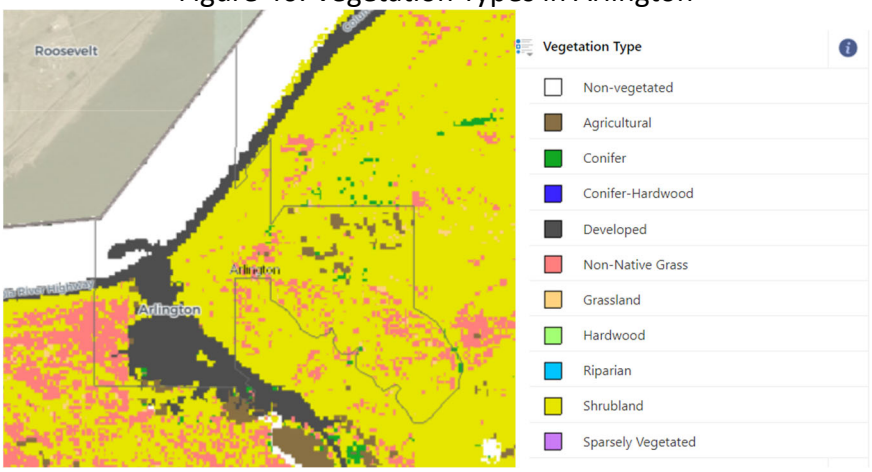
Source: Google Maps (13)

D. Vegetation

The vegetation in Arlington tends to be very flammable and located near structures. In general, many houses have overgrown vegetation very close to the home, whether wildland, maintained yards (roses are very popular within 1-2 feet of many homes) or non-maintained yards. Very few homes have performed vegetation management with fire prevention in mind, with bark dust and vegetation touching the house for aesthetic purposes being a very popular design choice.

Arlington is surrounded by shrubland (sagebrush and rabbit brush) and heavy populations of non-native annual grasses; both types of vegetation are highly flammable. The native trees in the region are the majority juniper, which are known for being extremely combustible.

Figure 46: Vegetation Types in Arlington



Source: Oregon Wildfire Risk Explorer (7)

Arlington is plagued by steep slopes throughout the town on which it is very difficult to control vegetation. As a result, throughout the entire town there are spaces of “no man’s land” in between houses that are outside fence lines, but between homes; frequently sandwiched between two fences. These no-man’s lands are full of overgrown cereal rye, cheatgrass, sumac trees, locust trees, and other brush and small grasses. While sumac and locust are not highly flammable, once lit on fire locusts will burn for a very long time.

Figure 47: No Man's land in Arlington

Source: Google Maps (13)

Houses are spaced closely throughout the town except for Columbia View Estates. The rest of the town has defensible space that bleeds into one another, frequently overgrown with vegetation. This vegetation is in the form of arborvitae, ornamental juniper, grass, coniferous trees, and annual flowers. Due to the dry conditions, if residents do not water their lawns frequently, they dry out and have a high potential to burn.

Arlington has many non-native deciduous and coniferous trees planted throughout the town. locust, elm, sumac, and Russian olive are very common, as well as different kinds of fir trees and ornamental juniper. Many of these trees are well-watered and overgrown, touching the houses and forming dense stands.

Figure 48: Tree Cover in Arlington

Source: Google Maps (13)

These trees are normally highly valued for the shade they provide, as it is not abnormal for Arlington to reach temperatures over 100 degrees in the summer. They also provide windbreaks from the strong winds traveling through the Columbia River Gorge. Encouraging residents to remove trees will be difficult, so the focus should be on trimming branches back from houses.

E. Building Construction

Arlington has a total of 246 housing units. These homes tend to have asphalt shingle or metal roofs, with wooden shake roofing being extremely uncommon. Most homes have wooden siding, which is in alignment with the median age of home construction which is 1973. All the major businesses are in buildings made of brick or cinder blocks. Of Arlington's 246 housing units, 78 are mobile homes, which constitute 34.5% of the total housing available. This is important to note because fires tend to burn hot and spread fast through mobile and manufactured homes, presenting an elevated risk to occupants and neighborhoods. Additionally, many people who own mobile homes do not own the land that the home is on, giving them less control over ways to mitigate their risk, such as creating defensible space (3).

Arlington has a 69.9% homeownership rate, which helps reduce the community's risk. Areas with lower homeownership rates experience significant difficulty reaching landowners about maintaining defensible space and methods of improving a home's survivability during a wildfire event. Homeowners have the ability to make changes to their homes without having to ask a landowner, and since it is their property at risk, are much more likely to make improvements.

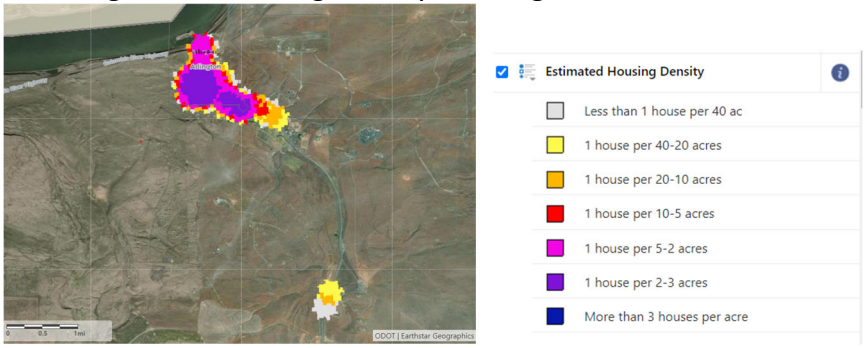
Figure 49: Arlington Housing Characteristics

Characteristic	Number	Percent of total
Total Housing Units 2021*	246	
Occupied	226	91.9%
Vacant	20	8.1%
For Rent	0	0.0%
Rented, not occupied	0	0.0%
For sale only	0	0.0%
Sold, not occupied	0	0.0%
Seasonal, recreational, occasional	4	1.6%
For migrant workers	0	0.0%
Other vacant	16	6.5%
Year Built		
Built 2010 or later	14	5.7%
Built 2000 to 2009	0	0.0%
Built 1990 to 1999	57	23.2%
Built 1980 to 1989	13	5.3%
Built 1970 to 1979	52	21.1%
Built 1940 to 1969	87	35.4%
Median year structure built	1973	

Source: USFS (3)

Housing density in Arlington is higher than throughout the county. In the center of the City density is 1 house per every 2-3 acres. This makes wildfire spread from structure to structure more likely. However, it is still a low housing density compared to most cities.

Figure 50: Housing Density in Arlington

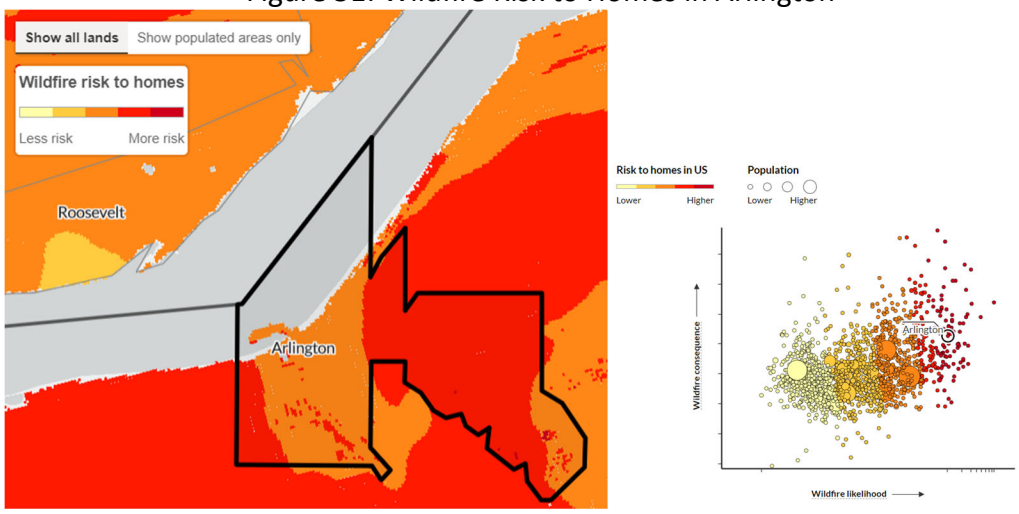


Source: Oregon Wildfire Risk Explorer (7)

There is currently no specific home ignition zone/defensible space program for the town, but there is a weed abatement regulation. The City of Arlington sends notices to all property owners once a year in the spring, prior to the beginning of Fire Season on June 1st. These notices are generic and remind homeowners to perform vegetation management on their property, or they may be fined up to $500. The Gilliam County Sheriff's Office is responsible for enforcement of this program. Sheriff's Deputies will patrol the city and issue tickets to people not performing weed abatement, as well as respond to complaints from residents or City personnel, which are normally focused on empty lots located on steep slopes. For absentee owners, frequently the fine is cheaper than the cost to remediate their property, so they will often take the fine.

The risk to homes in Arlington from wildfire is moderate to high. Along the edges of the City, the risk to homes is high, through the center of town, the wildfire risk is moderate.

Figure 51: Wildfire Risk to Homes in Arlington

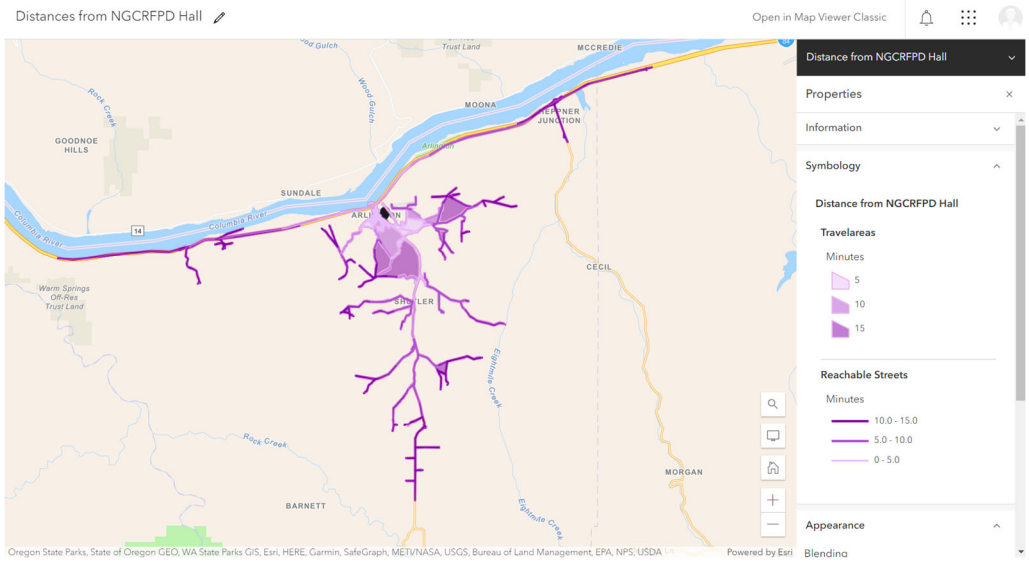


Source: USFS (3)

F. Fire Protection

Within the City of Arlington, all homes are within 5 minutes of the NGCRFPD Fire Hall. Within Arlington's urban growth boundary, all homes can be reached within 10 to 15 minutes. The eastern border of the county on I-84 is reachable within 15 minutes, as is Blalock Canyon to the west and Shutler Station to the south when driving time is just considered. Up until July 1, 2023, the average response time from NGCRFPD to any fire was 25 minutes, due largely to being staffed only by volunteers. If a call is made not during workhours when firefighters are home, response times are frequently quicker than the 25-minute average. A call during the workday, with most fire fighters working out of town increases response time, with 40 minutes not being abnormal for more rural parts of the district. On July 1, 2023, NGCRFPD hired a full-time Fire Chief, and it is expected that average response time will decrease.

Figure 52: NGCRFPD Response Time and Distance



Source: Cori Mikkalo, ESRI

There are fire hydrants located throughout the town of Arlington. These fire hydrants are maintained by the City of Arlington, who keep all the records, including which ones are in disrepair. NGCRFPD personnel most often use the fire hydrant in front of the NGCRFPD Hall to fill the fire engines and tenders in emergency and non-emergency situations. When fighting fires near Arlington, the tender will frequently refill at the Fire Station instead of at a closer fire hydrant, due to the large diameter hose that they leave attached to the hydrant outside of the station making the operation quicker.

G. Utilities

Pacific Power manages power for Arlington. All power is through overhead lines, with a large transformer station in the middle of town. Inside the fence of the station is gravel, but immediately touching the cyclone fencing along Hemlock Street is a thick stand of highly flammable ornamental juniper. There are no secondary power systems in case Pacific Power fails.

Figure 53: Power transformer station in Arlington

Source: Google Maps (13)

There are no natural gas services for Arlington. If residents wish to heat or cook with anything other than electricity, they bring in large propane tanks, which are located throughout the city.

There are 4 water towers in Arlington and one public sewage system. The areas around these important infrastructures are protected by 5-20 feet of well-maintained gravel serving as defensible space. The Wastewater Treatment plant is located under the bridge and is very well protected from wildfire.

Outside of the Urban Growth Boundary, Arlington is surrounded by windmill facilities that generate power. This power is sent to California through large transmission lines. The Slatt Substation is located on the outskirts of the UGB, approximately 2.6 miles from downtown Arlington. This substation is well maintained, located on a gravel lot with several feet of gravel extending outside of the base of the power lines.

Fiber optic internet is provided by the Arlington TV Co-Op. Fiber optic lines are located underground and have very little risk from fire except where they connect to homes that are at risk.

H. Additional Factors

A high risk for Arlington is its proximity to I-84, with its steep canyons of unmitigated rye, invasive cheatgrass and large amount of traffic that results in several small fires per year. The I-84 access ramps on the west and east sides of Arlington are very steep with large amounts of overgrown annual grasses.

The west side of Arlington, except for the I-84 access ramp, is bordered by agricultural land that is used for cattle grazing. As a result, the rangeland to the west is kept mowed down of annual grasses. There are large amounts of rabbit brush and sagebrush, but there is not the bed of continuous fine flashy fuels that annual rye and invasive grasses provide. The east side of town is not bordered by grazing land, and the hillsides as a result have a heavier fuel load of dry, invasive annual grasses.

Arlington has many undeveloped lots interspersed with homes throughout the town. Many of these lots are on steep slopes that are difficult to conduct vegetation management on and there is a large amount of absentee lot ownership. On the I-84 Interstate onramp on the west side of Arlington, all lots bordering it are steep, majority owned by people who do not live in town and are difficult to maintain. The City of Arlington imposes a $500 fine for not conducting mitigation activities, but this is often below how much it would cost to mow or remove vegetation, so landowners just pay it.

There are also several lots that are overgrown despite being relatively level and easy to mow, mainly due to absentee ownership. These undeveloped lots, in combination with the undeveloped no-man’s land in between homes throughout the entire town that is too steep to mow and difficult to use a string-trimmer on and remains frequently overgrown.

The Union Pacific Railroad has a train track that runs through Arlington. The train has gravel spread for 25 feet on either side of the train tracks from centerline, but further out from that is overgrown with annual grasses, sagebrush, and small trees, many of which are dead. Several entities are involved in maintaining this area, including Union Pacific Railroad, Watco, The City of Arlington, The Army Corps of Engineers, and Gilliam County. Developing a system to maintain this area that works with all involved parties is complex, but a priority for maintaining the safety of the City.

Chapter 3: Condon

Chapter 3 contains a risk assessment of Condon. It contains demographic information, wildfire risk and behavior, access, vegetation, building construction, fire protection, utilities and additional risk factors for the community, and high priority mitigation areas.

Condon

Condon is the Gilliam County seat and is located approximately 150 miles east of Portland. Condon's population as of the 2020 census was 711, a decrease of 59 individuals since 2000. The total number of housing units is 406, decreasing from 422 in 2000, with 338 of them occupied and 68 vacant (43). Condon's elevation is about 2,800 feet and it receives about 14 inches of precipitation per year (42).

The median household income is $35,000, $36,562 below Oregon median income. Condon has a low employment rate of 32.4%, with a poverty rate of 18.2%. Primary and secondary education is important to the community, with an 82.9% school enrollment rate; however only 17.7% of the population has a bachelor's degree, compared to the state rate of 36.3% (43). High poverty rates and low median income contribute significantly to a community's risk, and populations with less income have more difficulty preparing for and recovering from disasters.

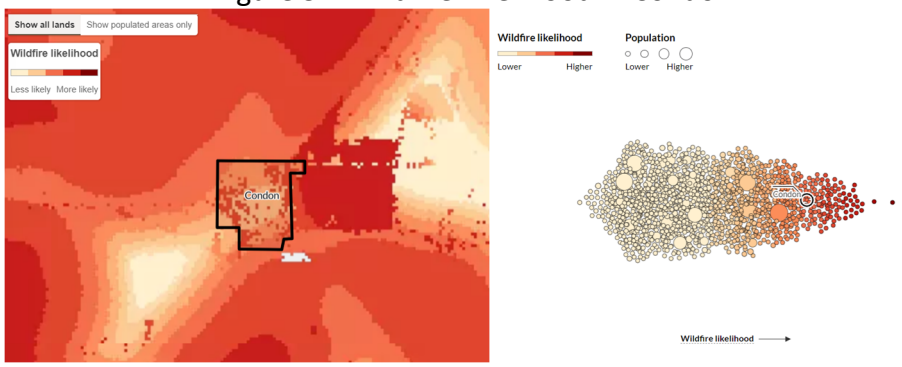
The median age of Condon residents is 65 years old, with 49.9% of the population being 65 years old or older. The average family size is 2.62, and 7.6% of the population is children under 18. Household makeup is: 33.6% married couple family households, 28.1% male householder, no spouse present, family household, and 37.4% is female householder, no spouse present, family household. The disabled population is also relatively high, at 20.6% (43). Condon's population make up contributes to a high wildfire risk, due to the extremely large number of elderly residents, and high percentage of the population that is disabled; groups that are typically disproportionately affected by disasters.

Condon does not have a large amount of racial or ethnic diversity; 640 out of 711 residents identify as white. Other races/ethnicities include 04 American Indian/Alaskan Native, 2 Asian, 3 black or African American, 38 Hispanic or Latino, 1 native Hawaiian and pacific islander, and 11 some other race according to the 2020 census (43).

A. Wildfire Risk

The City of Condon's risk of experiencing a wildfire is very high, approximately 93% higher than all other counties in the United States according to the USFS (3).

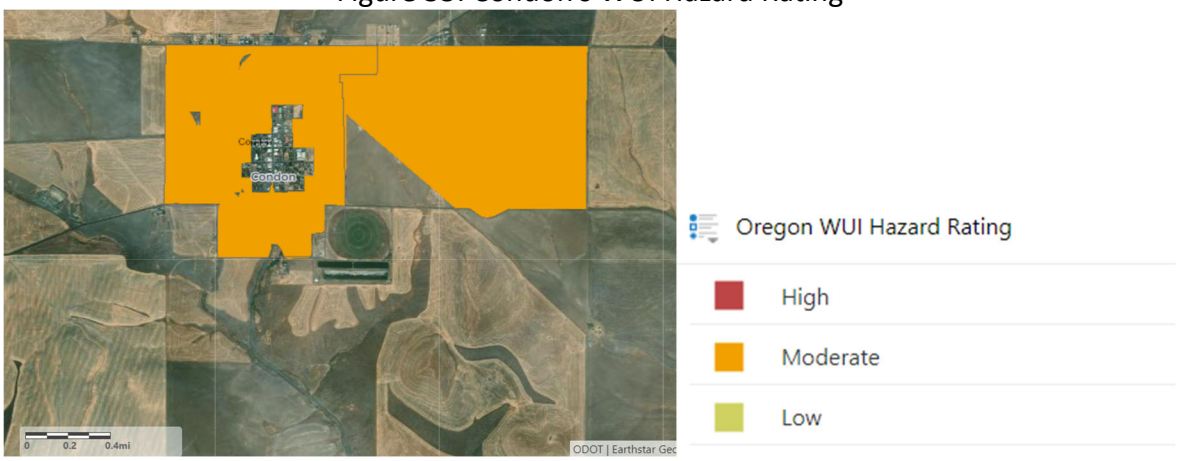
Figure 54: Wildfire Likelihood in Condon



Source: Wildfire Risk Explorer (3)

ODF has assigned Condon a WUI rating of moderate. This aligns with local observations, as while Condon is very isolated, it is also surrounded by relatively flat farmland that allows for easier fire suppression in the populated areas.

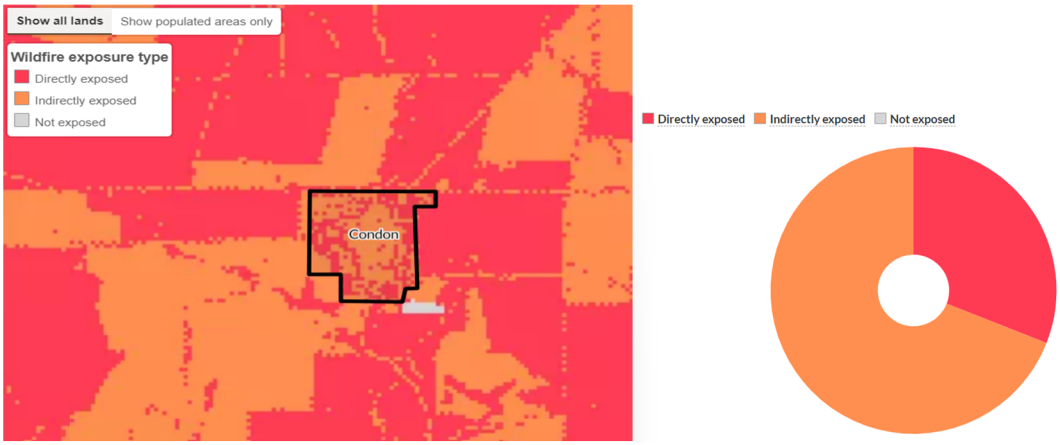
Figure 55: Condon's WUI Hazard Rating



Source: Oregon Wildfire Risk Explorer (7)

Condon is highly exposed to wildfire; the entire community is either directly exposed or indirectly exposed. The populated areas in Condon are mainly exposed to wildfire through indirect sources, such as embers or home-to-home ignition (3).

Figure 56: Condon Wildfire Exposure



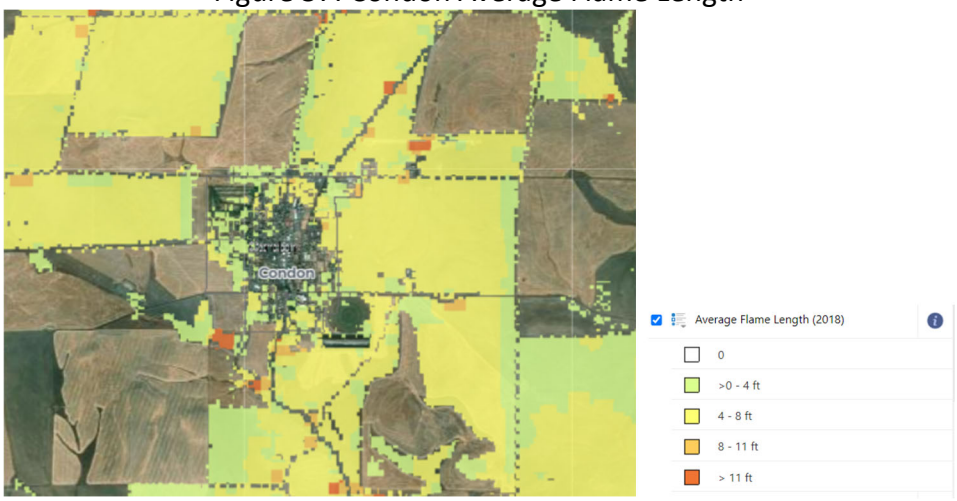
Source: USFS (3)

B. Wildfire Behavior

Wildfires in Condon are predominately wind-driven grass fires fed by invasive annual grasses, sagebrush and annual grain fields that are highly flammable once cured. The wild vegetation surrounding the town is expected to produce flame lengths of 0-4 feet, and the annual grain

crops are expected to produce flames that are 4-8 feet. Longer flame lengths mean fuels are burning faster, and flames over 4 feet are difficult to control without air support or fire breaks.

Figure 57: Condon Average Flame Length



Source: Oregon Wildfire Risk Explorer (7)

C. Access

The City of Condon is located on relatively flat terrain for the area, and overall has easy neighborhood access. There are dead-end streets that end on the edge of town, often into farmland or residences. While some streets may be difficult for a fire engine to turn around on, there are enough intersecting blocks that an engine would be very easily able to move around the block. Street parking is allowed on both sides of residential streets, which occasionally results in narrow roads for response vehicles. There are no neighborhoods that present an undue evacuation risk. There are 4 ways in and out of Condon; Highway 206 from the East, Highway 206 from the West, Highway 19 from the North, and Highway 19 from the South.

Figure 58: Road Access in Condon

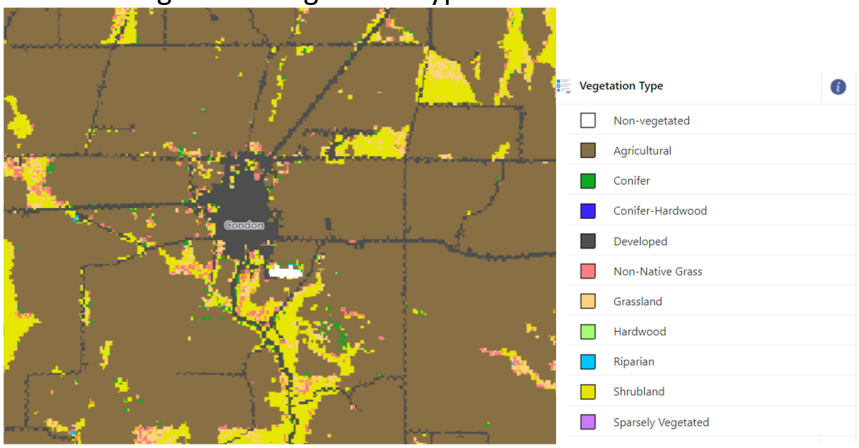
Source: Google Maps (13)

D. Vegetation

The vegetation in Condon tends to be flammable and located near structures. Many houses have vegetation close to the home in the form of annual and perennial flowers and shrubs. These garden plants vary from well-maintained to overgrown, but most, especially the flowers, are highly prized by the residents of the homes. Bark mulch is very common in the more well-maintained gardens. Vegetation distribution varies from house to house, with some homes having dry vegetation close to the home, and others maintaining a large amount of defensible space. Most defensible space is created from an ease of maintenance perspective, rather than a fire mitigation standpoint.

Condon is surrounded by farmland, shrubland consisting of sagebrush and rabbit brush, and grassland consisting of annual grasses, such as ryegrass and cheatgrass. Due to the relatively flat terrain, there is minimal fuel loading within city limits. Shrubland on the west side of town has been cited for fuel reduction. Condon has a lighter load of invasive annual grasses than the north end of the county.

Figure 59: Vegetation types in Condon



Source: Oregon Wildfire Risk Explorer (7)

Condon has many non-native deciduous and coniferous trees planted throughout the city. Locust and elm are very popular, as well as different decorative smaller trees. All trees in the city were planted by residents, and it is common for these trees to be well watered and overgrown, touching the houses and forming dense stands. Due to the lack of native trees, these planted trees within city limits tend to be highly valued by their owners for shade and aesthetic reasons. To reduce risk from trees, the focus should be on trimming branches back from homes as well as reducing ladder fuels, as many residents will be reluctant to remove trees.

Figure 60: Trees near homes in Condon

Source: Google Maps (13)

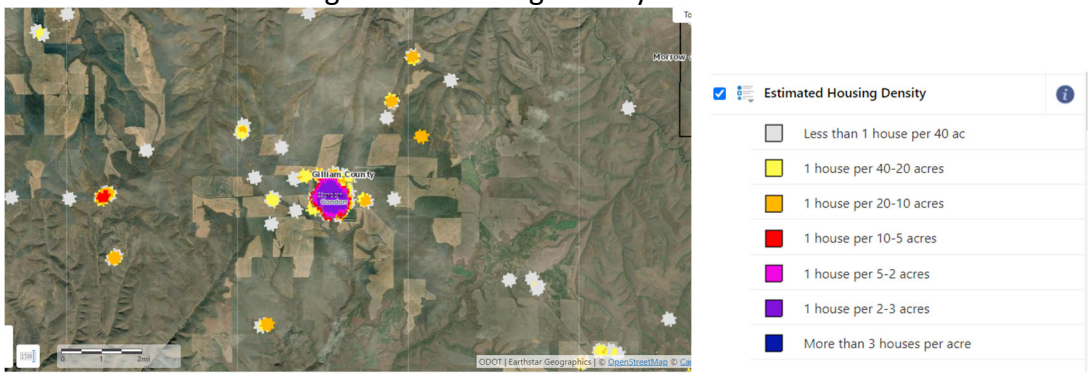
E. Building Construction

Condon has a total of 499 housing units according to the USFS. These homes have a mix of asphalt shingle, metal, and wooden roofing. Wooden roofs are the least common type of roofing but are still not uncommon to see throughout the community. Most homes have wooden sidings, which is in alignment with the median age of home construction which is 1954. Most businesses are in buildings made of brick or cinder blocks. Of Condon's 499 housing units, 16 are mobile homes (3.8%) (3). While flames spread quickly in mobile homes, due to the limited number it is not a significant concern for Condon.

Condon has a high homeownership rate is high of 78.6%, which is beneficial for Condon's risk overall. Landowners are more likely to maintain defensible space and conduct home hardening activities on their own property, reducing risk (3).

Housing density in Condon is 1 house per every 2-3 acres. This makes wildfire spread from structure to structure more likely than through less populated areas in the County. However, it is still a low housing density compared to most cities.

Figure 61: Housing Density in Condon



Source: Oregon Wildfire Risk Explorer (7)

Figure 62: Condon Housing Characteristics

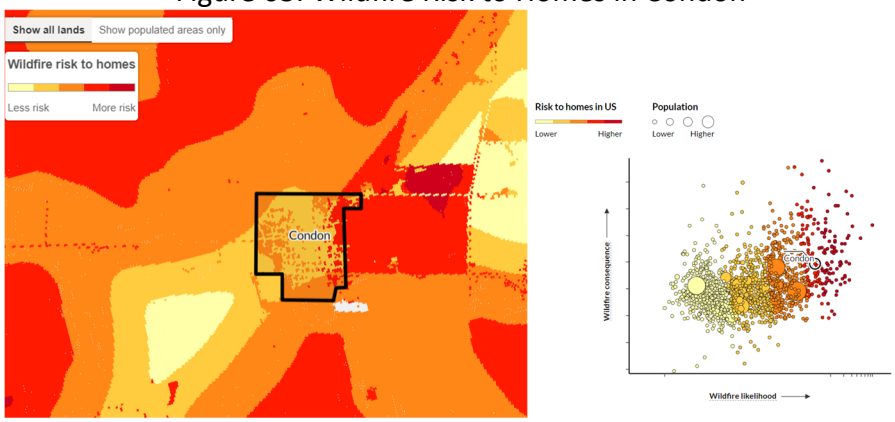
Characteristic	Number	Percent of total
Total Housing Units 2021*	499	
Occupied	420	84.2%
Vacant	79	15.8%
For Rent	11	2.2%
Rented, not occupied	0	0.0%
For sale only	14	2.8%
Sold, not occupied	0	0.0%
Seasonal, recreational, occasional	10	2.0%
For migrant workers	0	0.0%
Other vacant	44	8.8%
Year Built		
Built 2010 or later	0	0.0%
Built 2000 to 2009	56	11.2%
Built 1990 to 1999	66	13.2%
Built 1980 to 1989	07	1.4%
Built 1970 to 1979	26	5.2%
Built 1940 to 1969	196	39.3%
Median year structure built	1954	

Source: USFS (3)

There is currently no specific home ignition zone/defensible space program for the town. The City of Condon has regulations on vegetation management and institutes a burn ban over the hot summer months. The SGCRFPD Chief will patrol the town looking for violations of the burn ban or for unsafe levels of vegetation. When he finds locations he contacts the Gilliam County Sheriff's Office, which is responsible for the enforcement of these requirements. The Sheriff will contact the individuals, who either fix their violation or pay a fine.

In Condon, the risk to homes is moderate to lower throughout the city, except for the east side of the city where the risk is evaluated as being higher. The area of higher risk is directly bordered by an annual grain field.

Figure 63: Wildfire Risk to Homes in Condon

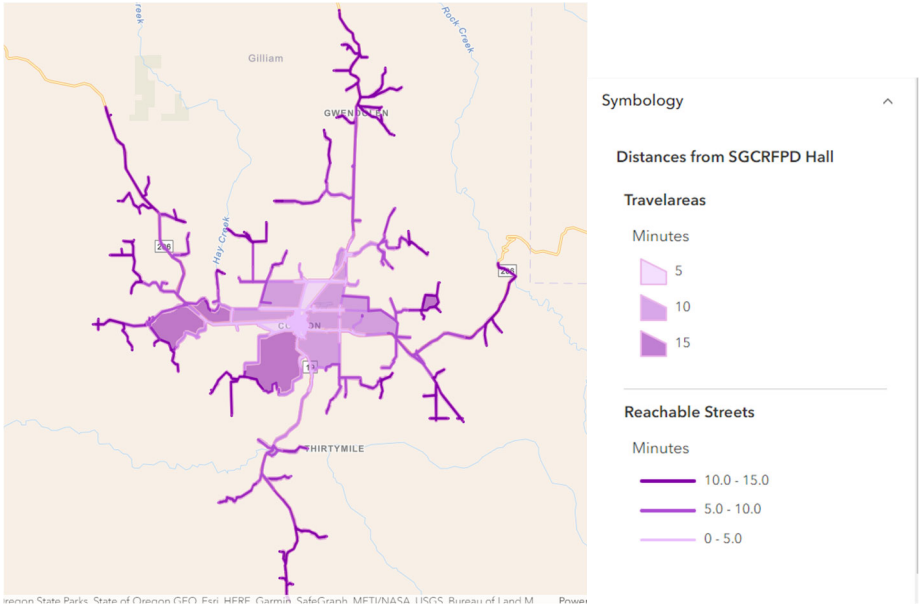


Source: USFS (3)

F. Fire Protection

All homes within Condon are 5 minutes from the SGCRFPD Fire Hall. Within Condon's UGB, all homes can be reached within 10 to 15 minutes. Smaller settlements, including Mayville, Gwendolen, and the Condon Radar Base/Community at Richmond Road are within 15 minutes of the Fire Hall.

Figure 64: Distances from SGCRFPD Hall



Source: Cori Mikkalo, ESRI

Response times can vary greatly, depending on the distance from the Fire Hall. SGCRFPD does not have any full-time staff, and where their volunteers are located when a call comes in greatly varies. Average response time for all fires is 25 minutes, but this includes the rural fires that can take 40 or more minutes to respond to. Within city limits, response time is frequently within 10 minutes or less for structure fires.

There are fire hydrants located throughout the City of Condon. These fire hydrants are maintained by the City of Condon, who keep records of their maintenance. SGCRFPD personnel will use the fire hydrant in front of the SGCRFPD Hall to fill the fire engines and tender in emergency and non-emergency situations. When fighting fires near Condon, the tender will frequently refill at the Fire Station instead of at a closer fire hydrant, due to the large diameter hose that they leave attached to the hydrant outside of the station making the operation quicker.

G. Utilities

Columbia Basin Electric Co-Op manages electricity for Condon. All power is through overhead lines, with a large transformer station located on the North end of town On Condon Airport Rd and Brown Ln. The substation is completely graveled in and surrounded by a mowed lot. There are no secondary power systems in case Columbia Basin has a power failure. There is a generator at City Farm and a backup generator for wastewater headworks.

Figure 65: Condon Substation

Source: Google Maps (13)

There are no natural gas services for Condon. If residents wish to heat or cook with anything other than electricity, they bring in large propane tanks, which are located throughout the city.

Condon does not have traditional water towers. They have two 175,000 gallon in ground ponds and one 500,000-gallon water tank. These are all located approximately one mile northwest of the city. Vegetation is kept short around the reservoir, and the city property is surrounded by agricultural fields and can be easily reached for a disc line in an emergency. The wastewater treatment center is located at 1034 S Jefferson Street and is surrounded by a gravel road.

Fiber optic internet is provided in Condon through lines that are located underground and have very little risk from wildfire, except for where they connect to homes.

H. Additional Factors

Condon is surrounded by agricultural land, which provides more of a benefit for fire management than a detriment despite the large flame lengths that burning annual grains can produce. The land surrounding the city is easy to access, and while in July and August there is danger from the cereal grain crops being dried out, there are also many farmers with disc plows that set fire lines around the city in the event of an emergency.

There are empty lots located throughout the city, but they tend to be mowed and not overgrown. On the West side of the City near the golf course there is a large field of sagebrush bordered by rangeland that is a high fire risk.

Condon is incredibly isolated, located 20 miles from the nearest mutual aid in Wheeler County, and slightly over 64 miles from large agencies with full-time staff that can provide mutual aid.

Condon has a small community on Richmond Road, locally referred to as the Condon Radar Base, as the community was built next to an Air Force General Surveillance Radar Station that was closed in 1970. It is located 6.2 miles out of town and has 26 homes. While located outside of the town, it is considered part of the City. This neighborhood is 10 minutes from the Fire Hall and is surrounded by annual grasses. It is also immediately bordered by the abandoned radar base which has many empty buildings, large debris, and tall flammable vegetation that could easily ignite. Due to this area being so high risk, attempts in the past have been made to put in a precautionary fuel break in the form of a disc line. The ground surrounding the community is extremely rocky and attempts to install a disc line have been unsuccessful.

The neighborhood has two roads in and out, but there is one large cul-de-sac that only has one way in and out. The houses are on septic systems, and there is one community water source. Along Richmond Rd, there is one power substation, which has gravel defensible space around it. Homes have asphalt shingle roofs but appear to have wooden siding. Some of the homes have well-maintained yards, and others are overgrown with large trees close to the home. Due to its isolation from the rest of the community and its relatively high housing density, this neighborhood should be a large target for community outreach and mitigation projects.

Figure 66: Condon Radar Base/Richmond Road Community

Source: Google Maps (13)

Chapter 4: Lonerock

Chapter 4 contains a risk assessment of Lonerock. It contains demographic information, wildfire risk and behavior, access, vegetation, building construction, fire protection, utilities and additional risk factors for the community, and high priority mitigation areas.

Lonerock

Lonerock has a total population of 25 people, with 27 housing units. 17 homes are occupied, with 10 vacant (44). Lonerock's elevation is 2,800 feet and it receives an average of 14 inches of rain per year (20).

The median age is 61.3 years, with 26.1% of the population 65 years or older (44). This elderly population increases their risk to natural disasters.

Median income was not determined in the 2020 census, but 26.1% of the population lives in poverty. There are no children, and 26.1% have a bachelor's degree or higher. The employment rate is low at 39.1%, but the homeownership rate is high at 83.3% (44). The low employment rate is most likely due to elderly residents that have retired; however, the high poverty rate increases the community's vulnerability to wildfires.

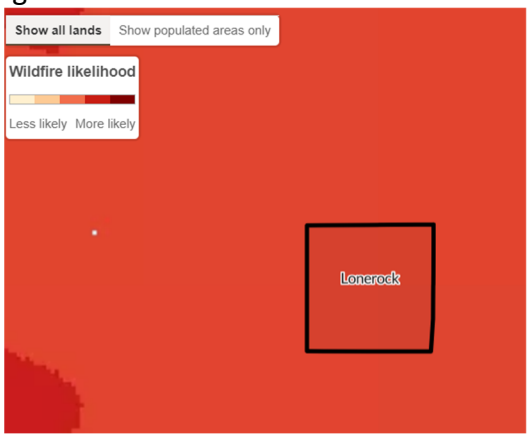
26.1% of the population is disabled in Lonerock, and the average household size is 2 persons. 25% of the population is married couple family household, 16.7% is male householder, no spouse present family household, and 41.7% is female householder, no spouse present, family household (44).

Lonerock is a homogenous community, with 21 residents identifying as white, 1 as Asian and 2 as Hispanic/Latino (44).

A. Wildfire Risk

The City of Lonerock has a very high risk of experiencing a wildfire, approximately 97% higher than all other communities in the United States according to the USFS (3).

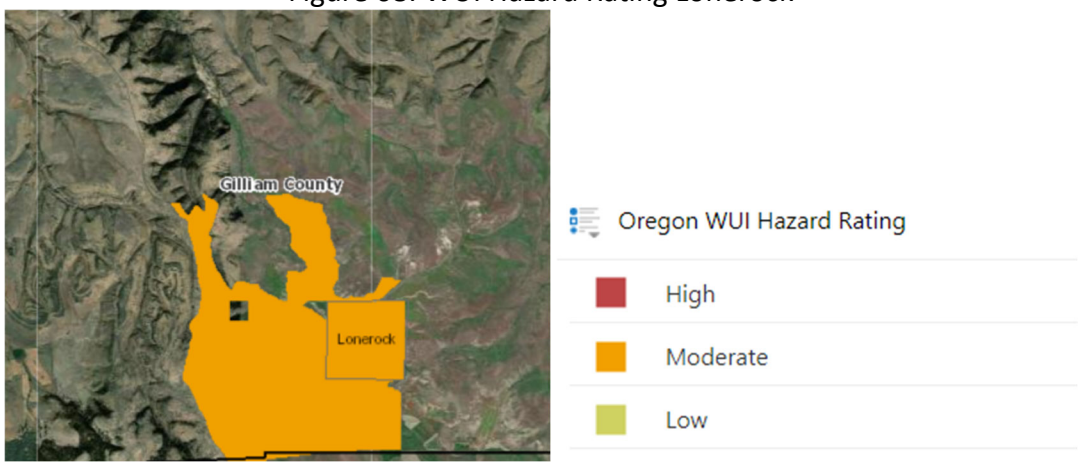
Figure 67: Wildfire Likelihood for Lonerock



Source: USFS (3)

ODF has assigned Lonerock a moderate WUI hazard rating, supporting the USFS assertion that Lonerock is more likely than not to experience a wildfire. Lonerock is an isolated community, but due to low population rates and being surrounded by irrigated hay fields their risk is moderate.

Figure 68: WUI Hazard Rating Lonerock



Source: Oregon Wildfire Risk Explorer (7)

Lonerock is highly exposed to wildfire, with the entire community either being directly exposed or indirectly exposed. 71% of Lonerock is directly exposed to wildfire, and 29 % is indirectly exposed.

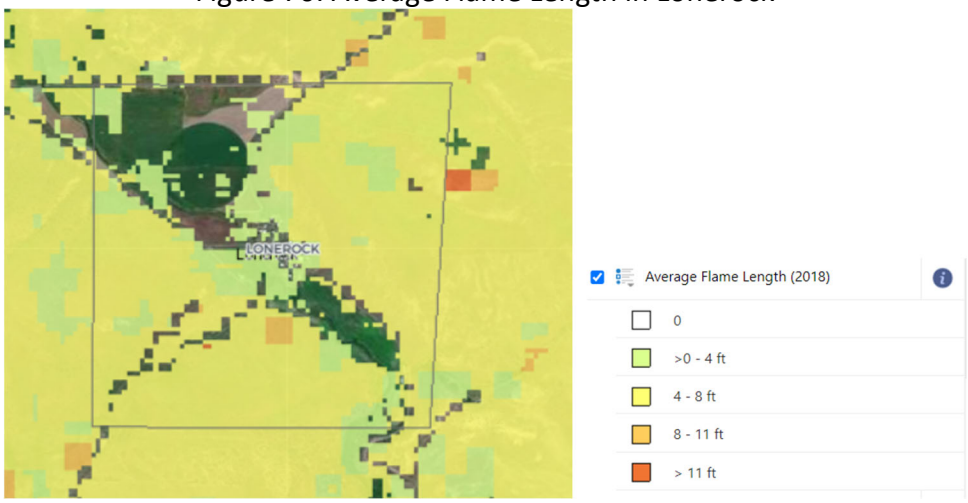
Figure 69: Lonerock Wildfire Exposure

Source: USFS (3)

B. Wildfire Behavior

Lonerock is vulnerable to wind-driven grass fires, as well as forest fires. The city has a population of invasive annual grasses, as well as thick stands of juniper, contributing to these types of fires. Flame length around Lonerock is expected to be 0-4 feet and 4-8 feet. Directly surrounding the town, it is 0-4 feet, but immediately adjacent it is 4-8 feet, most likely due to the prevalence of juniper trees in this area. The town is at the bottom of a valley, so the structures are not threatened by fire racing uphill, but communications towers are. Fires have potential to burn hot and fast due to the invasive annual grasses, and if ladder fuels are not kept in check, forest fires with flame lengths of 4-8 feet or higher, which cannot be easily extinguished with water will take place.

Figure 70: Average Flame Length in Lonerock



Source: Oregon Wildfire Risk Explorer (7)

C. Access

The City of Lonerock has three ways in and out. Lonerock Road from the west and east, and Buttermilk Road to the north. Lonerock only has 26 housing units, with long driveways versus actual dead-end streets, making access for fire suppression vehicles easy. However, since the town is nestled in the bottom of a valley, if the residents need to evacuate the decision should be made well ahead of time, as the evacuation routes are steep gravel roads surrounded by trees. An additional factor that can make access difficult is Lonerock Road to the west has a bridge immediately prior to entering the city. This is the main access point for SGCRFPD assets, as well as the main evacuation route for residents. If Lonerock Bridge were to suffer a casualty, it would greatly affect how the community must react to a wildfire.

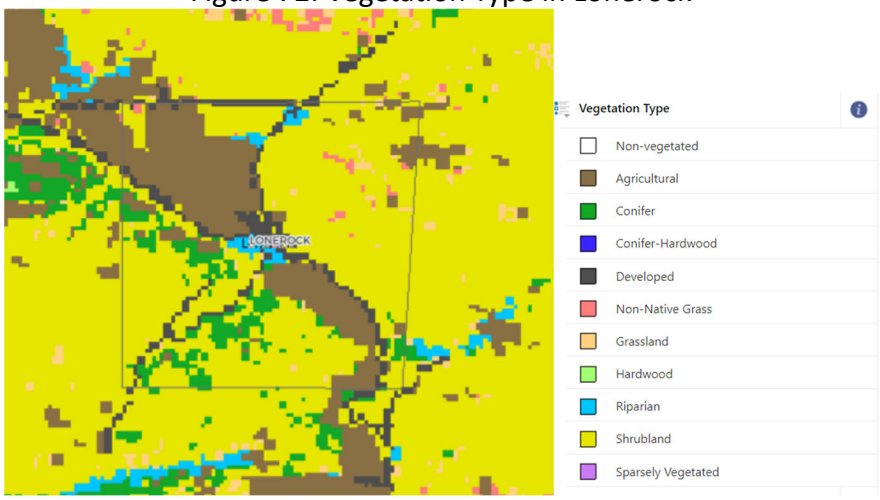
Figure 71: Lonerock Road Access

Source: Google Maps (13)

D. Vegetation

Lonerock is surrounded by agricultural land, shrubland, and conifer forest. The shrubland is mainly sagebrush and rabbitbrush, and the conifers are juniper; all these plants are highly flammable. The agricultural land is mainly irrigated hayfields, which can help serve as fuel breaks in between the rest of the flammable materials if the fields are wet and green.

Figure 72: Vegetation Type in Lonerock



Source: Oregon Wildfire Risk Explorer (7)

Lonerock has non-native deciduous trees planted throughout their community, often close to houses. These trees are watered and taken care of by residents, and highly valued for shade and aesthetics. They present a risk to the community due to being located close to the houses and many branches touching roofs.

Figure 73: Lonerock Trees Close to Homes

Source: Google Maps (13)

E. Building Construction

Lonerock has a total of 24 housing units. These homes tend to have asphalt shingle or metal roofs, with wooden shake roofing being extremely uncommon. Most homes have wooden siding, which is in alignment with the median age of home construction which is 1971. There is historical infrastructure, including a church, jail, and schoolhouse, all made of wood with wooden roofs. While no one resides in these structures, they are very important to the culture of the city.

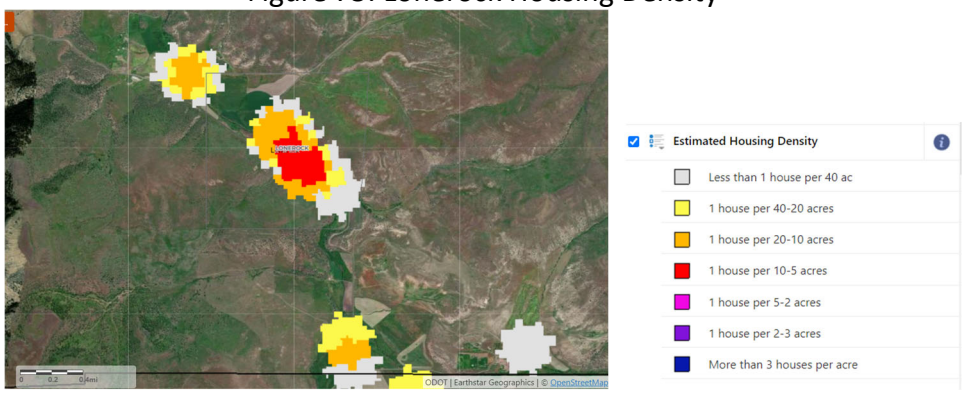
Figure 74: Lonerock Housing Characteristics

Characteristic	Number	Percent of total
Total Housing Units 2021*	24	
Occupied	12	50.0%
Vacant	12	50.0%
For Rent	0	0.0%
Rented, not occupied	0	0.0%
For sale only	0	0.0%
Sold, not occupied	0	0.0%
Seasonal, recreational, occasional	9	37.5%
For migrant workers	0	0.0%
Other vacant	3	12.5%
Year Built		
Built 2010 or later	0	0.0%
Built 2000 to 2009	0	0.0%
Built 1990 to 1999	02	8.3%
Built 1980 to 1989	0	0.0%
Built 1970 to 1979	11	45.8%
Built 1940 to 1969	02	8.3%
Median year structure built	1971	

Source: USFS (3)

Housing density in Lonerock is low, with the densest area having 1 house per 10-15 acres. This lack of density reduces the risk of fire spreading from structure to structure.

Figure 75: Lonerock Housing Density

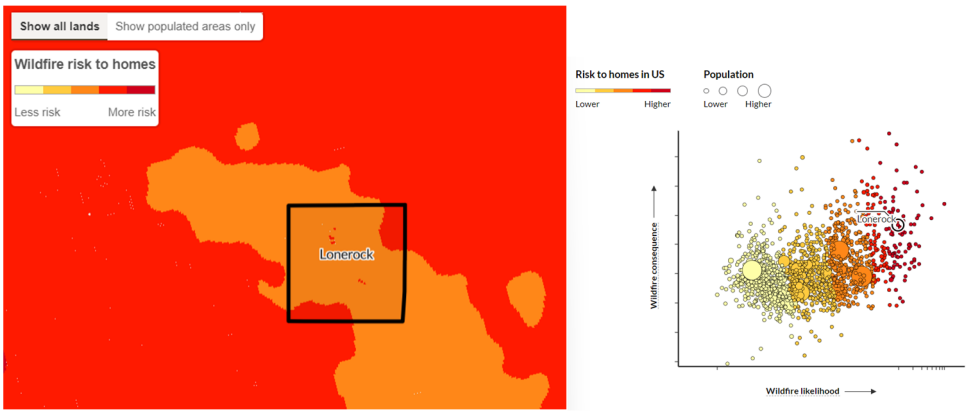


Source: Oregon Wildfire Risk Explorer (7)

There is currently no specific home ignition zone/defensible space program for the town. The City of Lonerock is populated by older adults who are generally community minded and maintain defensible space around their homes to protect themselves and their neighbors.

The wildfire risk to homes in Lonerock is moderate, bordered by areas of higher risk.

Figure 76: Lonerock Wildfire Risk to Homes



Source: USFS (3)

F. Fire Protection

The nearest fire station to Lonerock is the South Gilliam County Rural Fire Protection District station in Condon, located 21.4 miles away and approximately a 32-minute drive. The City of Lonerock maintains two older structure engines for fire protection, these engines are run by volunteers with no formal firefighting personnel. The main water sources are private wells, and there is no municipal maintained water or sewage treatment.

G. Utilities

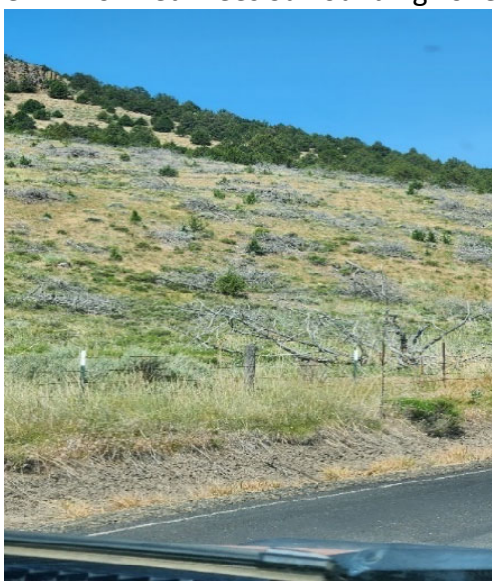
Lonerock has overhead power lines and is serviced by Columbia Basin Electric Co-Op.

H. Additional Factors

Lonerock is an extremely isolated small community with an elderly population. The closest cities are Condon (21.1 miles and 30 Minutes), Heppner (33 miles and 51 minutes), and Spray (33 miles and 64 minutes). This isolation makes fire suppression difficult, and in the case of a large-scale event, Lonerock plans to evacuate to Condon.

Between 2010 and 2018 the Gilliam County Soil and Water Conservation District in conjunction with the Natural Resources Conservation Service worked with multiple landowners through multiple funding sources to reduce the load of juniper trees surrounding Lonerock for fuel management and for watershed enhancement. Trees were thinned on several properties, and while many piles of juniper were burned, most of it was just left to lie where it was cut down. While the needles have since fallen off reducing the ignition potential of the trees, there is still a large volume of heavy fuels on the landscape surrounding the city, contributing to its fire risk.

Figure 77: Downed Trees Surrounding Lonerock



Source: Cori Mikkalo (45)

Lonerock is a small agricultural community and is bordered to the northeast and southwest by irrigated hay fields. Hayfields present a moderate ignition risk, as there is frequently heavy machinery traversing through them which can catch fire, but often the fuels are wet even when there is a heavy fuel load. Hay presents a larger risk after it has been cut and is in haystacks than it does in the field.

Conclusion

This assessment of Gilliam County's wildfire risk and preparedness provides a comprehensive overview of the critical factors and dynamics that shape the county's vulnerability to wildfires. The assessment encompasses key elements such as social vulnerability, fire department infrastructure, geographic descriptions, and the essential roles of local agencies, making it a valuable resource for understanding the complex interplay between natural and social factors that influence wildfire risk in the region. By delving into specific terms and definitions, we have gained insights into the strategies and challenges associated with managing wildfires in this area.

To effectively use this information, readers are encouraged to consider the multifaceted nature of wildfire risk and preparedness. It is essential to recognize that successful mitigation strategies involve a combination of community engagement, emergency response planning, and collaboration between various agencies and stakeholders. By understanding the significance of factors such as social vulnerability, evacuation routes, and fire weather indices, readers can make more informed decisions and prioritize efforts to enhance the county's wildfire resilience. The assessment's insights into mitigation tactics, such as backburning and the creation of defensible spaces, offer practical solutions that can be tailored to the specific needs of each community within Gilliam County.

Readers should further consider the critical importance of community-based strategies, plans like this one, in building resilience against wildfires. These plans facilitate cooperation between residents, local agencies, and stakeholders, fostering a collective approach to wildfire preparedness and prevention. Additionally, the understanding of wildfire risk to homes, as defined by the United States Forest Service (USFS), underscores the urgency of proactive measures, even in areas where residential structures may not currently exist. This academic assessment equips readers with valuable knowledge to drive evidence-based decisions and prioritize resources for the safeguarding of lives, property, and the natural environment in Gilliam County.

GLOSSARY- List of Acronyms

Emergency Response Plan: A formal document outlining specific procedures, resources, and responsibilities for responding to and managing emergencies, including wildfires.

Evacuation Routes: Designated roads or pathways that residents should follow to leave a wildfire-affected area safely during an evacuation.

Fire Behavior Analyst: An expert who assesses and predicts how a wildfire is likely to behave based on factors like weather, topography, and fuel conditions.

Firebreak: A cleared or barren area designed to impede the progress of a wildfire by removing combustible vegetation, thereby creating a barrier.

Fire Perimeter: The boundary that encloses the entire area affected by a wildfire, often used to track the size and containment status of the fire.

Hotspot: An area within a wildfire where the flames are particularly intense, often indicating a fast-moving and dangerous front.

Incident Commander: The individual responsible for managing and coordinating the overall response to a wildfire or emergency incident.

Mitigation: The action or process of reducing the severity, impact, or risk of disasters such as wildfires through proactive measures, planning, and actions.

NGCRFPD: North Gilliam County Rural Fire Protection District

OSFM: Oregon State Fire Marshal

SGCRFPD: South Gilliam County Rural Fire Protection District

Social Vulnerability: Refers to the social, economic, and cultural factors that influence access to resources and the ability of individuals, households, or communities to prevent, respond to, and recover from events such as wildfires.

UGB: Urban Growth Boundary

USDA: United States Department of Agriculture

USFS: United States Forest Service

Wildfire Exposure: The USFS defines it as "the intersection of wildfire likelihood and intensity within communities. Communities can be directly exposed to wildfire from adjacent wildland vegetation or indirectly exposed to wildfire from embers and home-to-home ignition."

Wildfire Risk to Homes: As defined by the USFS, it is the relative consequence of wildfire to residential structures everywhere on a landscape, whether a home actually exists or not.

Wildfire Likelihood: Calculated by the USFS, it uses fire modeling across thousands of simulations that include the probability of fire occurring, weather, topography, and ignitions based on variations from recent decades.

Wildland Urban Interface (WUI): Anywhere homes and other structures meet the wildland environment, whether that environment is brush or woodland.

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About Fair Winds Consulting, LLC

Approach

Fair Winds Consulting strives to create custom products tailored to each small community that are useful and meet all state and federal requirements. We understand that each community faces different unique challenges and disasters, and that in order for a plan to be truly useful, we must understand exactly what each community needs and provide that. Fair Winds can provide as much or as little support as needed. We can lead the entire planning or exercise project or provide background support.

Why Fair Winds?

Fair Winds Consulting has extensive experience preparing for and responding to disasters. Growing up and living in rural Eastern Oregon means we understand the unique challenges faced by small and rural communities. 16 years of military experience allows us to understand how to work with the Federal Government. This coupled with extensive experience preparing for and responding to extreme weather events and over 11 years' experience writing a wide variety of plans enables us to create custom products that are useful for their communities that meet all state and federal requirements.

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