

LAKE COUNTY, OREGON

Community Wildfire Protection Plan



**Presented to Lake County Commissioners
September 26, 2024**

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Signatures:

As required by the HFRA, the undersigned Lake County Commissioners, Lake County Fire Defense Board and Oregon Department of Forestry acknowledge that they have reviewed and agree with the contents of this plan.

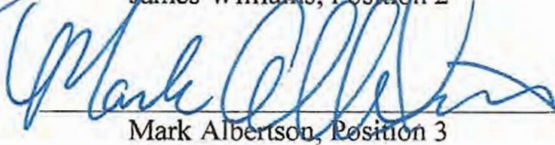
Lake County Commissioners


Barry Shullenberger, Position 1

9/26/2024
Date


James Williams, Position 2

9-26-2024
Date


Mark Albertson, Position 3

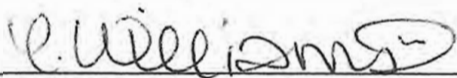
9/26/2024
Date

Lake County Fire Defense Board Chief


Keith Little, Lake County Fire Defense Board Chief

9-25-2024
Date

Oregon Department of Forestry


District Forester, Klamath- Lake Oregon District

9/26/24
Date

EXECUTIVE SUMMARY

The Healthy Forests Restoration Act (HFRA) of 2003 provides the impetus for wildfire risk assessment and planning at the county and community level specifically identifying “Wildland Urban Interface Communities Within the Vicinity of Federal Lands That are at High Risk From Wildfire” (H.R. 1904-3 Sec. 101, (1) (A) (i)). HFRA refers to this level of planning as Community Wildfire Protection Plans (CWPP). *The CWPP allows a community to evaluate its current situation with regards to wildfire risk and to devise ways to reduce risk for protection of human welfare and other important economic, social or ecological values. The CWPP may address issues such as community wildfire risk, structure flammability, hazardous fuels and non-fuels mitigation, community values, community preparedness, and emergency procedures.* The Core Group provides oversight to the development and implementation of the CWPP in Lake County.

The Lake County Community Wildfire Protection Plan (CWPP) was initially prepared for the south-central part of the County in 2005 followed by an update in 2011 which addressed North Lake County. This document encompasses the entire County and is the 2024 revision of the earlier plans, which continue to provide a solid foundation. The purpose of all Lake County CWPPs is to meet the intent of the National Fire Plan (NFP) and HFRA. These documents were prepared to support the planning efforts of all agencies and districts that participate in wildland fire management throughout Lake County. A recent report by Headwaters Economics on relative wildfire risk predicted the likelihood of wildfire and risk to homes in Lake County relative to the rest of the state is 87 percent and the nationwide percentile for wildfire likelihood and risk to homes at 87 percent. The primary focus of the Lake County CWPP is the numerous improvements and homes that occur throughout the Wildland-Urban Interface (WUI). A significant portion of the County consists of “Intermix Communities” where structures are scattered throughout the wildland area with no clear line of demarcation and wildland fuels are continuous within and outside of developed areas. Human life and welfare are values at risk to wildfire because of the buildup of hazardous fuels around communities and structures, poor emergency vehicle ingress and egress, lack or inadequate communication, inadequately trained and/or equipped fire suppression authorities, or complete absence of structure fire suppression authorities. Throughout the county there are scattered small communities and ranches with no structure fire protection because they are outside an organized fire district. Other economic values at risk include businesses, timberland, farmland, ranchland, hunting and other recreational lands, historic and cultural sites, and critical infrastructure.

Wildland fire is a common occurrence in Lake County and lightning causes the large majority of those fires. Several wildland firefighting agencies are present in the county and are very effective at putting out fires rapidly. However, the demographics of Lake County continue to shift and as the number of structures in the WUI has increased so has the cost of firefighting. Protecting improvements during wildland firefighting is more costly.

This updated version of the Lake County CWPP encompasses the entire County. Wildland Urban Interface/Intermix boundaries will be six miles on each side of major highways and the Bear Flat Road; three miles on each side of secondary and major Forest Service roads (two digit); and one mile on each side of other roads. The potential operational delineations (PODs) and potential control lines (PCLs) concepts will be utilized to define other Values at Risk. The Risk Management Assessment (RMA) dashboard provides accurate real-time information and will be utilized for this purpose.

Natural resource management policy and changing ecological conditions have interacted in ways that have resulted in hazardous fuel situations throughout Lake County. These hazardous fuel conditions are the result of historic fire suppression policy, juniper invasion into sagebrush, grasslands and timberlands, changing climatic patterns, and lack of forest management activity on federal lands. The large accumulation of fuels has made most areas in the county very vulnerable to potentially catastrophic wildfire with the resulting loss of important economic, social, cultural and ecological values.

Excess fuels around communities, ranches and structures create problems for fire protection and suppression. Fuels may consist of conifer and juniper forests, sagebrush, grasslands, and weed fields. Finer fuels such as grasses, sagebrush and weeds are highly flammable, burn rapidly, and resist control. Forested areas with heavy standing and/or down fuels can burn with extreme intensity. A coordinated effort is needed in the County that includes all fire and emergency response authorities, private landowners and County and city officials to effectively manage hazardous fuels to reduce the risk of wildfire and to understand and promote the responsibility of all citizens to prepare for wildfire.

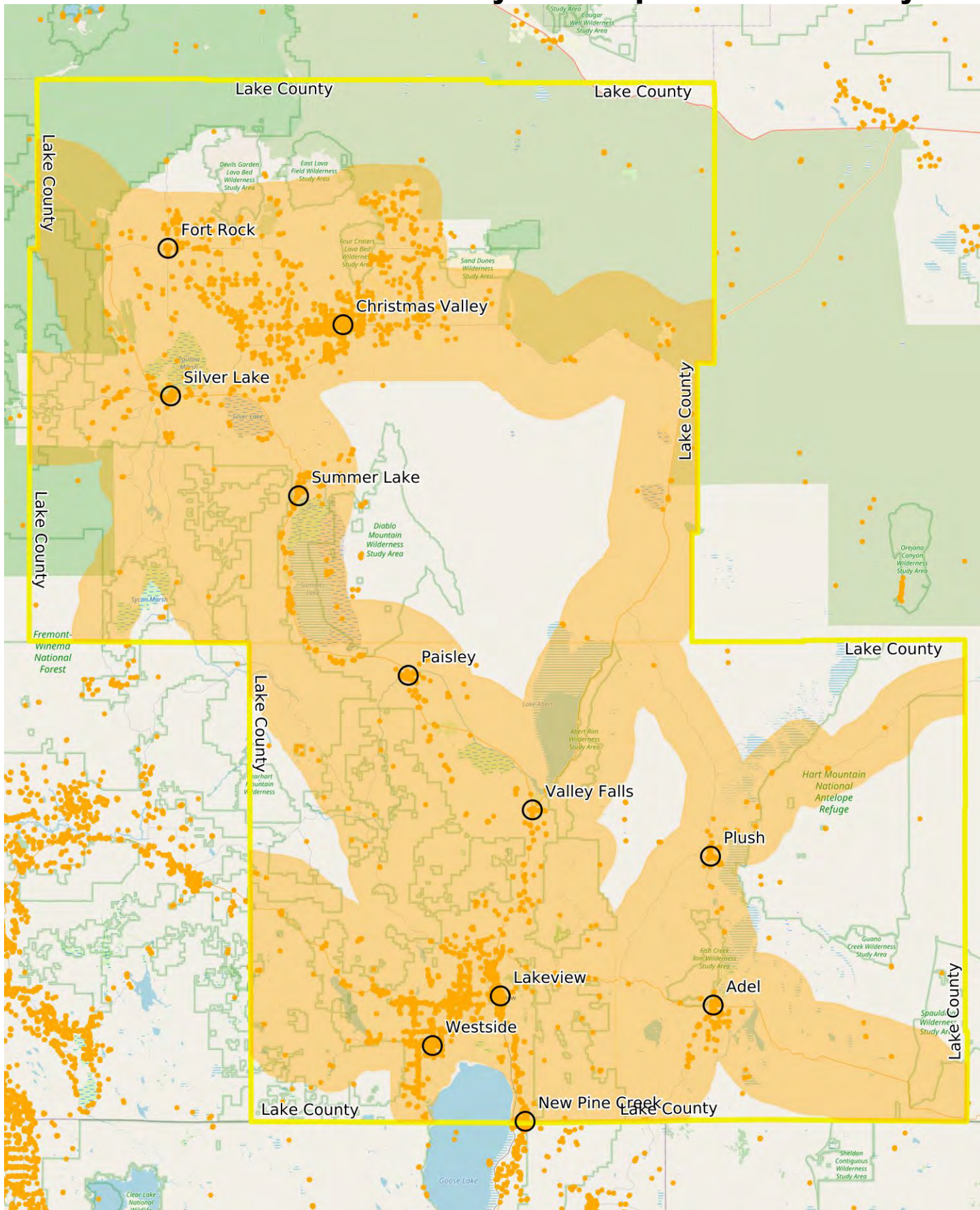
South Central Oregon Fire Management Partnership (SCOFMP) is an alliance of fire suppression authorities in Lake County that work together, however each fire authority operates under regulations that dictate their specific area of responsibility.

Public outreach for the 2024 CWPP revision has been ongoing in the County through various interactions with emergency services personnel, natural resource agencies, and more. The revision utilizes the Community Risk Reduction model as promoted by the National Fire Academy (NFA) and focuses on 1) Fuels Reduction, 2) Prevention and Education, and 3) Emergency Services as the foundation for the Lake County wildfire protection and mitigation strategy.

Implementing and sustaining the CWPP is key to success and this is the responsibility of the Core Team. Building and maintaining partnerships among community-based organizations, fire protection authorities, local governments, land management agencies, and private landowners is critical in identifying and prioritizing measures to reduce wildfire risk. The CWPP encourages residents of the County to take an active role in identifying needs, developing strategies, and implementing solutions to address wildfire risk. The CORE group will meet annually to review and document accomplishments from the previous year and to discuss

planned accomplishments for the coming year as well as noting any minor revisions or updates needed in the CWPP. The CWPP is a “*Living*” document.

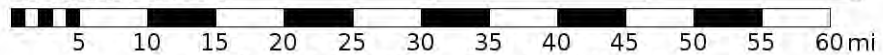
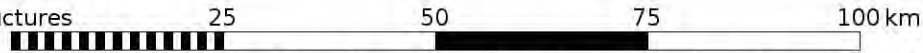
Lake County Base Map and WUI Boundary



Communities and Structures

WGS84

UTM Zones 10T-11T



Scale **1:890680** 1 inch = 14.1 miles



MN
13.7°

LIST OF ACRONYMS AND ABBREVIATIONS

BLM	Bureau of Land Management
CWPP	Community Wildfire Protection Plans
EQIP	Environmental Quality Incentives Program
FEMA	Federal Emergency Management Agency
FEPP	Federal Excess Personal Property
FERC	Federal Emergency Regulatory Commission
FRCC	Fire Regime Condition Class
GIS	Geographic Information System
HFRA	Healthy Forests Restoration Act
IMT	Incident Management Team
KLFHP	Klamath Lake Forest Health Partnership
LIFC	Lakeview Interagency Fire Center
MOU	Memorandum of Understanding
NFPA	National Fire Protection Association
ODF	Oregon Department of Forestry
OFPA	Oregon Forest Protection Act
ODOT	Oregon Department of Transportation
OSFM	Oregon Office of the State Fire Marshal
OWEB	Oregon Watershed Enhancement Board
RFA	Rural Fire Assistance
RFPA	Rangeland Fire Protection Association
SCOFMP	South Central Oregon Fire Management Partnership
USFS	US Forest Service
USFWS	US Fish and Wildlife Service
WFU	Wildland Fire Use
WUI	Wildland Urban Interface/Intermix
WHIP	Wildlife Habitat Incentives Program

LAKE COUNTY
Community Wildfire Protection Plan

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LAKE COUNTY COMMUNITY WILDFIRE PROTECTION PLAN

1 INTRODUCTION

1.1 CWPP Purpose and Process

The Healthy Forests Restoration Act (HFRA) of 2003 provides the impetus for wildfire risk assessment and planning at the county and community level and specifically refers to communities that are at risk of fire coming off of Federal Lands. HFRA refers to this level of planning as Community Wildfire Protection Plans (CWPP). The purpose of the CWPP is for communities to take full responsibility and advantage of wildland fire and hazardous fuel management opportunities offered under HFRA legislation. *The CWPP allows a community to evaluate its current situation with regards to wildfire risk and to devise ways to reduce risk for protection of human welfare and other important economic, social and ecological values. The CWPP may address issues such as community wildfire risk, structure flammability, hazardous fuels and non-fuels mitigation, community values, community preparedness and emergency procedures.* The CWPP provides for the United States Forest Service (USFS), the Bureau of Land Management (BLM), and other federal, state and county agencies to consider the priorities of local communities for forest and rangeland management as well as hazardous fuel reduction projects.

The South-Central Lake County CWPP was completed in 2005 and the North Lake County CWPP was completed in 2011. The original South CWPP utilized the one quarter mile boundary for the Wildland Urban Interface (WUI) definition. Because wildfire can move extremely rapidly across the landscape in Lake County, the South Lake CWPP was revised and the North Lake CWPP was created designating a three mile boundary for the WUI throughout the entire County.

This updated version of the Lake County CWPP encompasses the entire County. Wildland Urban Interface/Intermix boundaries will be six miles on each side of major highways and the Bear Flat Road; three miles on each side of secondary and major Forest Service roads (two digit); and one mile on each side of other roads. The potential operational delineations (PODs) and potential control lines (PCLs) concepts will be utilized to define other Values at Risk. The Risk Management Assessment (RMA) dashboard provides accurate real-time information and will be utilized for this purpose.

As stated throughout this plan, the process of revising and updating the CWPP will help Lake County clarify and refine its priorities for the protection of life, property, critical infrastructure,

significant agricultural, recreational, and scenic areas, and landscapes of historical, economic, biodiverse, or cultural values in the WUI. The CWPP allows a community to evaluate its current situation with regards to wildfire risk and to plan ways to reduce risk for protection of human welfare and other important economic, social and ecological values. This CWPP revision utilizes the Community Risk Reduction model a promoted by the National Fire Academy (NFA) and focuses on 1) Fuels Reduction, 2) Prevention and Education, and 3) Emergency Services as the foundation for the Lake County wildfire protection and mitigation strategy.

The CWPP will address issues such as community wildfire risk, structure flammability, hazardous fuels and non-fuels mitigation, community preparedness, prevention and education as well as emergency procedures. The plan will be tailored to meet the specific needs of the various communities. The CWPP process consists of the following steps:

- Organize the CWPP Committee
- Federal Agency Involvement
- Community Interested Parties
- Community Base Map
- Develop a Community Wildfire Risk Assessment
- Hazard Reduction Priorities and Recommendations to Reduce Structure Flammability
- Develop an Action Plan and Assessment Strategy
- Finalize the CWPP

1.2 Community Wildfire Plan History and Accomplishments

History.

The original South Central and North Lake County Community Fire Protection Plans, written in 2005 and 2011 respectively, provided a solid foundation and clear path for the County to move forward with significant steps to mitigate the potential of loss to life, property and resources from wildfire. This plan builds on that foundation.

Accomplishments.

All of the agencies, and many private landowners, have engaged in significant fuel reduction and mitigation activities on the landscape since the initial CWPP was adopted. Two Rangeland Forest Protection Associations (RFPAs) were established; a 250 gpm well was developed north of Lakeview; fuel/fire breaks were constructed around Paisley; cooperation and communication has continued to improve among all the agencies in the County along with many achievements. For specific information refer to the tables in Appendix D.

1.3 Lake County Need for Updated CWPP

The Lake County CWPP has been in effect for the past 13 years. A look back at those years provides insight on the approach that will best utilize the strengths in the original plans as well as creating a path for the future.

The updated Lake County CWPP is an umbrella plan that will provide information for local-level fire prevention efforts while utilizing the foundational 2005 and 2011 community wildfire plans. The revised Lake County CWPP will include a county-wide wildfire hazard assessment, county-wide community base map, and a discussion of the county's wildfire suppression situation. The revision will utilize a "Community Risk Reduction" (CRR) approach. The National Fire Academy (NFA) 1452, Guide for Training Fire Service Personnel to Conduct Community Risk Reduction, 2015 ed., defines community risk reduction this way: "Community risk reduction integrates emergency response with prevention. Community risk reduction involves identifying and prioritizing risks, selecting and implementing strategies, monitoring and evaluating activities, and involving community partners, all in an effort to better protect residents and firefighters."

CWPPs and Firewise Communities help protect and prepare communities in the event of a wildfire. If your community resides in the WUI and you believe there is a risk of wildfire, a CWPP or a Firewise Community can be an excellent tool to gain community support to raise awareness about wildfire threat and to gain support to mitigate hazards. CWPPs can be prepared at both the county and the community levels and often the most successful programs are those with grassroots efforts. Benefits of CWPPs include:

- Counties and communities benefit from a CWPP by being more prepared for a wildfire.
- A CWPP can influence where and how federal monies are spent on hazardous fuels reduction.
- Counties and communities with CWPPs can compete competitively for public funding to implement hazardous fuels reduction projects.
- Counties and communities can work cooperatively with technical and public safety experts to reduce vulnerability to wildfire hazards in their communities.
- Counties and communities can take ownership of efforts to reduce wildfire hazards in their communities.

Gathering stakeholder input through a variety of methods and venues is the best method to achieve the best products, local knowledge, and community involvement. Stakeholder input will identify and address specific needs presented by the communities.

Wildland fires are a common occurrence in Lake County and historic fire occurrence was a major ecological influence in shaping the natural vegetation. The threat of wildfire continues today. However, wildfire risk to human welfare and economic, social and ecological values is more serious today than in the past because of the buildup of hazardous fuels, construction of houses in proximity to forests and rangelands, increased outdoor recreation, and a lack of public appreciation of wildfire. Lightning-caused fires have been the dominant ignition source for hundreds of years and continue to be the main cause of fire in the County. However, human-

caused fires have occurred, and their frequency will likely become more numerous as the population grows and outdoor recreation and travel through the County increases.

Natural resource management policy and changing ecological conditions have interacted in ways that have resulted in hazardous fuel situations throughout the County. These forces include historic fire suppression policies, western juniper and pine invasion into meadows, sagebrush and grasslands, increases in invasive grasses and weeds, and changing climate patterns. The accumulation of hazardous fuels may set the stage for more catastrophic wildfire occurrences in the County, resulting in the loss of important economic, historic, cultural and ecological values. There are various types and volumes of fuels around communities, ranches, and structures that create problems for fire protection. Fuels include ponderosa pine and juniper forests, sagebrush habitat, grasslands, and weed fields. Many of these fuels, such as dry great basin wildrye and other grasses and weeds, are highly flammable, burn rapidly, and resist control. A coordinated effort among all fire authorities, agencies and private landowners in the County is needed to manage hazardous fuels and reduce the risk of wildfire.

1.6 Lake County Wildfire Management Mission, Goals and Objectives

The mission, goals and objectives for the revised Lake County CWPP were developed in response to input from city, County, state and federal officials; input from Lake County Fire Defense Board, Klamath Lake Forest Health Partnership (KLFHP) and input gathered from community meetings and landowner outreach. The mission statement from the 2013 CWPP has been updated and expanded to better reflect the current needs and concerns of the County in this CWPP.

Mission.

Reduce the risk from wildfire to life, property, historic and cultural sites, and natural resources; implement a robust and sustained prevention and education program for all citizens in the County; assist with resource management of lands within Lake County in a manner that benefits the local economy and local communities while maintaining, protecting and enhancing natural resources.

Goals and Objectives.

Facilitate a CWPP in Lake County:

- Provide oversight to all activities related to the CWPP.
- Ensure representation and coordination among agencies and interest groups.
- Position the County to be resilient in the event of wildfire.
- Implement a robust and sustained education and prevention program for residents.
- Develop a robust and sustained education and prevention program for visitors, tourists, recreationists, hunters, fisherman and travelers that have occasion to visit or pass through the County.
- Develop a long-term framework for monitoring and sustaining CWPP efforts.

Conduct wildfire risk assessments:

- Conduct a county-wide wildfire risk assessment.
- Identify communities and areas at risk and contributing factors.
- Determine the level of risk that structures, improvements, cultural and historic resources, unique or special plants and animals, and other values at risk throughout the County are to wildfire and contributing factors.
- Identify strategic fuelbreak locations throughout the County.
- Identify evacuation routes throughout the County.

Develop a mitigation plan:

- Prioritize strategic fuelbreaks, including evacuation routes, and develop implementation plans.
- Identify priority hazardous fuel treatment projects with an emphasis on cross-boundary work.
- Identify and prioritize non-fuels mitigation needs.
- Identify, prioritize and implement strategically positioned water sources throughout the County.

Manage hazardous fuels:

- Sustain a long-term, landscape approach to fuels management that focuses initially on high wildfire risk areas with the goal of moving toward Fire Regime Condition Class 1 throughout the County.
- Identify priority fuel treatments based on risk assessment and apply for grants and other funding sources.
- Focus strategic hazardous reduction projects on communities at high risk and along key evacuation routes throughout the County.

Facilitate emergency planning:

- In conjunction with the Lake County Natural Hazards Mitigation Plan, develop strategies to strengthen emergency management, response, communication and evacuation capabilities for wildfire.
- Build emergency response resources.
- Identify and develop various additional water sources throughout the County.
- Build relationships among County government, fire authorities, and communities.
- Develop education and prevention programs for residents in communities throughout the County.
- Implement pre-planning and establish evacuation routes throughout the County.

Facilitate public outreach:

- Develop strategies to increase citizen awareness in the cities as well as the rural areas, and promote action for “Firewise” practices.
- Work with citizens to create “Firewise” communities as interest occurs.
- Work with schools, youth groups, and other community organizations to promote awareness of wildfire risks and mitigation strategies.
- Promote public outreach and cooperation for all fuels reduction projects to promote community involvement and private landowner cooperation.

2 LAKE COUNTY PROFILE

2.1 Geography and Vegetation

Lake County lies partially in the northwest corner of the Great Basin. Vast expanses of big sagebrush (*Artemisia tridentata*) cover much of the northern portion of the County, primarily on BLM lands. The pine forested eastern slope of the southern Cascade mountains occupies much of the west side of Lake County in the Fremont-Winema National Forest and the North Warner Mountains lie in the center of the county.

The Warner Mountains are an 85-mile long mountain range running north–south through northeastern California and extending into Lake County in southern Oregon. This range lies within the northwestern corner of the Basin and Range Province, extending from the northeastern corner of Lassen County, California and northward into Lake County. (Wikipedia) Professional foresters from Collins Companies have learned that the genetic composition of white fir trees in the Warners is unique to this area. Since these trees are specific to this area, seedlings are not available and local government and timber companies are considering the establishment of a nursery. Sound stewardship of this unique resource, including protecting it from wildfire, is critically important.

2.3 Socioeconomic Profile

The economy of Lake County continues to be driven primarily by livestock, agriculture, forest products and manufacturing. Tourism is increasing for numerous reasons including the March 2024 designation Lake County as the world’s largest Dark Sky Sanctuary.

2.3 Communities

Lakeview and Paisley are the two incorporated cities, while Adel, Plush, Valley Falls, Summer Lake, Silver Lake, New Pine Creek and Christmas Valley are unincorporated communities. Ranches, clusters of structures and scattered structures are dispersed throughout the County.

According to the Oregon Wildfire Risk Explorer (OWRE) advanced report, *all* communities in Lake County are at *high risk* of impact from wildfire based on the surrounding vegetation. This rating does not consider building construction materials, defensible space around structures and infrastructure, or ingress, egress and evacuation issues. Local knowledge of area weather and wind patterns, roads and access, water sources, potential and alternate evacuation routes is absolutely *critical* for developing and implementing an effective and functional CWPP.

Community	Fire Authority	Community Risk Factors
Adel	Warner Valley RFPA	Combustible material on some structures; dry fuels on agricultural lands in late summer and fall; lack of defensible space around some structures; above ground utilities.
Alkali Lake	BLM – Wildland Only	Combustible material on some structures; above ground utilities; no structure fire protection.
Christmas Valley	Christmas Valley RFPD	Lack of defensible space around structures; combustible material on some structures; above ground utilities;
Drews Gap/Drews Reservoir Quartz Mountain	ODF- Wildland Only	Lack of defensible space around structures; combustible material on some structures; above ground utilities; lack of streets signs; lack of house numbers; steep, narrow, non-surfaced private roads and driveways; ingress/egress issues; alternate evacuation routes; no structure fire protection.
Fort Rock	Walker Range -Wildland Only	Lack of defensible space around structures; combustible material on some structures; above ground utilities; no structure fire protection.
Lakeview	Lakeview Fire Department	Lack of defensible space around structures; combustible material on some structures; lack of community awareness of wildfire risk. County Fairgrounds need well with suitable connections for tanker fills.
New Pine Creek	New Pine Creek RFPD	Lack of defensible space around structures; combustible material on some structures; lack of community awareness of wildfire risk.
Paisley	Paisley Fire Department/High Desert RFPA	Lack of defensible space around structures; combustible material on some structures; city needs a new well.

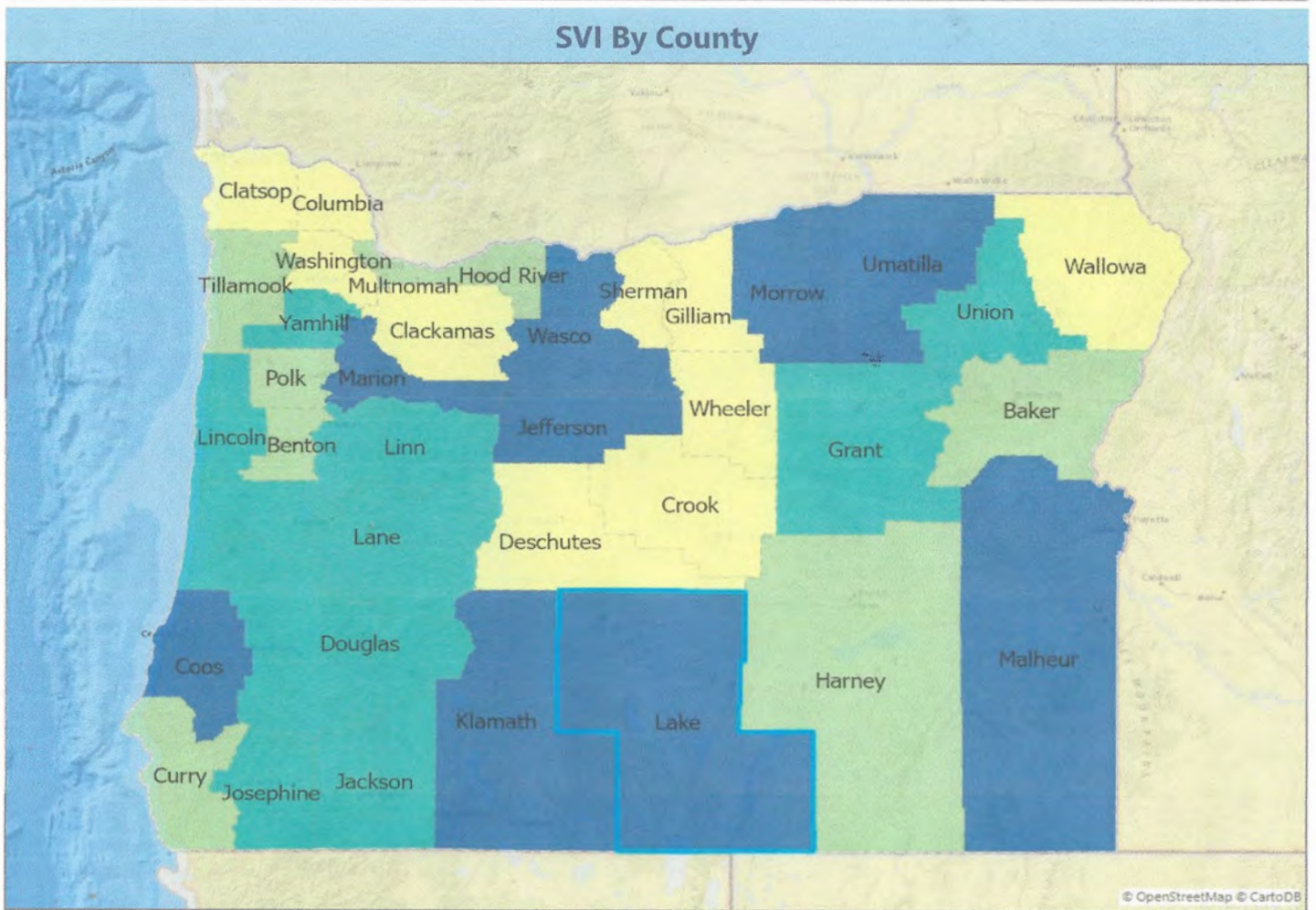
Plush	Warner Valley RFPA	Combustible material on some structures; dry fuels on agricultural lands in late summer and fall; lack of defensible space around some structures; above ground utilities.
Silver Lake	Silver Lake RFPD	Combustible roof/siding on some structures; dry fuels on agricultural lands in late summer and fall; lack of defensible space around some structures; above ground utilities.
Summer Lake/Ana Estates	Silver Lake RFPD/High Desert RFPA	Lack of defensible space around structures; combustible material on some structures; above ground utilities; lack of streets signs; lack of house numbers; ingress/egress issues; alternate evacuation routes; no structure fire protection.
Valley Falls	High Desert RFPA	Combustible roof/siding on some structures; above ground utilities; no structure fire protection.
Westside	Westside/Thomas Creek RFPD	Lack of defensible space around structures; combustible material on some structures;

2.3 Vulnerable Populations

Some areas, primarily in North County, have seen a dramatic increase in vulnerable populations. The high cost of living in neighboring Deschutes County and other areas, has resulted in a migration of lower income and other disenfranchised populations to Lake County. Various settlements, camps and other types of living quarters and situations are scattered throughout the area. Per the 2020 Oregon Census, Lake County has 16.1 % persons in poverty compared to the statewide average of 12.1%.



Social Vulnerability Report



- Lake County
- Lowest Vulnerability (0-25th percentile)
- Low to Moderate Vulnerability (25-50)
- Moderate to High Vulnerability (50-75)
- Highest Vulnerability (75-100)

Figure 2. Overall Social Vulnerability by County



Home located west of Christmas Valley.

2.4 Climate

Lake County climate is semi-arid with long severe winters and short, hot, dry summers. The twelve-month average temperature has increased 2.8 degrees F from May 1900 to April 2023. The 12-month total precipitation increased 0.8 inches from May 1900 to April 2023. From May 1900 to April 2023, the average 12-month total precipitation was 14.2 inches. (USA Facts) Long range climate predictions are for the strong return of El Nino (Capital Press, April 21, 2023).

2.5 County Vegetation

Physiographic and geologic provinces and some aspects of soils are interrelated, as well as climate and vegetation. (USDA Forest Service, General Technical Report PNW-8). This is apparent in the vegetation which is characterized by vast expanses of sagebrush and other high desert vegetation, western juniper, ponderosa pine, lodgepole pine and white fir depending on the location in the County.

2.6 Water Resources

Lake County supports surface water in the form of lakes, ponds, rivers, and springs. Twelve watersheds, either in total or in part, are present in Lake County. Abundant water is critical for wildfire suppressions and structure protection. It is important to note that some identified lakes are playas, dry lake beds sometimes temporarily covered with water, that are not suitable as drafting sources for wildfire. The County is noticeably drier than it has been in recent history due to prolonged drought, and excess vegetation in some areas of the watersheds. There is a need to develop a comprehensive georeferenced list of available water sources in the County as well as opportunities for development of new water sources.

2.7 Recreation

A broad variety of recreation activities are enjoyed in the County including birding, hunting, camping, rock collection and star gazing. Lake County was recently designated an official “Dark Sky Sanctuary”. Since the pandemic in 2020, a new type of “camper” has evolved. Aggressive off-road vehicles, both street legal and off-road, are utilizing the County’s “outback” more and more frequently. Campers and trailers made for wilderness type experiences are common. This increase in recreational use, in formerly remote areas, has the potential to increase fire starts in inaccessible areas and has already been detrimental to road systems not created for heavy use. Increased messaging on fire prevention, regulated use/fire restrictions is needed in these areas. There is a need to identify locations for messaging, as well as the need to secure funding for signage and kiosks and other prevention tools and strategies.

2.8 Wildlife and Ecology

Flyways are the main routes birds use to move north and south across North America. The wetlands around Summer Lake provide an important rest stop in the mostly dry and inhospitable expanse of the continent’s Great Basin. Lake County is rich with a wide variety of wildlife including a multitude of avian and terrestrial species.

2.9 Historical and Cultural Resources

Lake County has a tremendously rich history and wealth of cultural resources. The Paisley caves have yielded evidence of human habitation radiocarbon dated back over 14,000 years. Prehistoric artifacts in the Fort Rock Caves include basketry, stone tools, and woven sagebrush sandals dated to more than 10,000 years ago. (Wikipedia)

2.10 Critical Infrastructure

Critical infrastructure includes cell towers, large solar arrays near the towns of Lakeview and Christmas Valley, large transmission lines crossing the County, a large Bonneville Power Administration (BPA) communications site on Glass Butte, and an “Over-the-Horizon Backscatter Radar Network, Christmas Valley Radar Site Transmit Sector Four Communications Antennas” near Lost Forest Road and Christmas Valley.

Critical infrastructure also includes facilities such as hospitals, clinics, fire, police, and ambulance stations. Water is a critical resource in Lake County and any type of source for both drinking water, livestock water, drafting or filling source for fire suppression must be protected and/or enhanced. Therefore, focused efforts for fuels reduction in these areas is needed.

3.1 Fire History

Lake County has had a dramatic and devastating fire history. The deadliest fire in Oregon history occurred in Silver Lake on Christmas Eve 1894, where between 160 and 200 people had gathered to celebrate the holiday in the community hall above the general store. An oil lamp was broken, which started this fire. The only evacuation route from the second story was one set of stairs and a door that opened inward which led to this horrendous tragedy. Forty people died the day of the fire and another three died later. (Wikipedia)

During May 1900, a fire in Lakeview destroyed 64 buildings in town. Although no lives were lost, only two commercial buildings escaped the fire. In 1977 the aging Chewaucan Hotel in the town of Paisley caught fire and spread to and destroyed three other buildings in town. Damage from the fire extended to other buildings due to the tremendous heat. Residents feared, and not without good reason, that the entire town would burn like Lakeview did in 1900.



Lakeview Fire 1900



Chewaucan Hotel fire 1977

In recent history, Lake County has suffered enormous losses to natural resource assets from wildfire, including

- 2021 Bootleg 413,717 acres
- 2021 Cougar Peak 91,701 acres
- 2020 Brattain 50,952 acres
- 2018 Watson Creek 59,065 acres
- 2012 Barry Point 92,945 acres

According to Headwaters Economics, Lake County has a higher risk of wildfire than 87 percent of the counties in the United States. Populated areas in Lake County have both a higher risk and higher likelihood of impacts from wildfire than 43 percent of the counties in Oregon.

3 EMERGENCY MANAGEMENT

3.1 Emergency Services

South Central Oregon Fire Management Partnership (SCOFMP) was formed approximately ten years ago and is an alliance between:

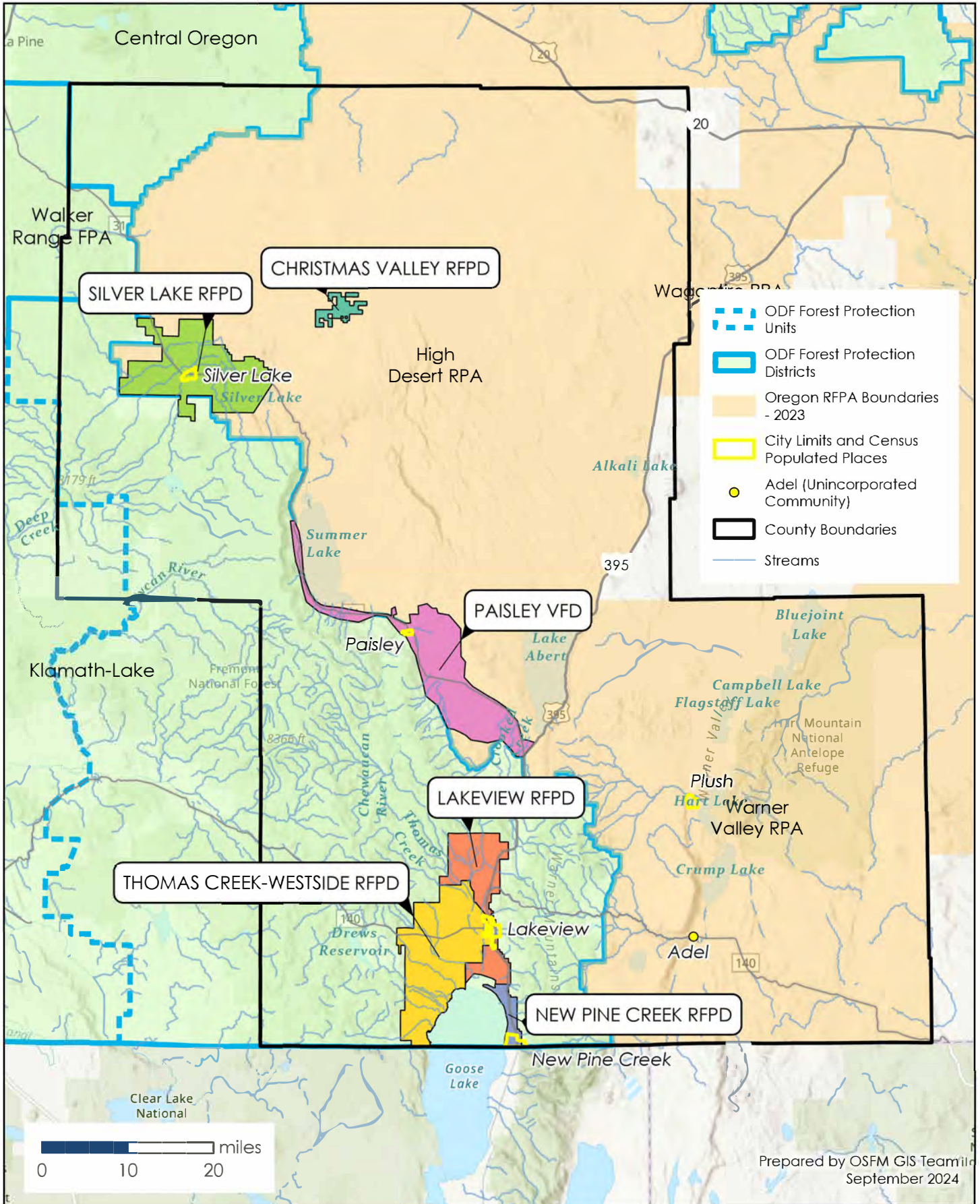
- Fremont-Winema National Forest, USFS
- Lakeview District, BLM
- Sheldon-Hart Mountain National Wildlife Refuge and Klamath Basin National Wildlife Refuges Complex, U.S. Fish and Wildlife Service
- Crater Lake National Park, National Park Service
- Klamath–Lake District, Oregon Department of Forestry
- Lake County Fire Defense Board, Lake County
- Klamath County Fire Defense Board, Klamath County

SCOFMP is an interagency fire management program that provides comprehensive wildland fire service to south central Oregon and northwest Nevada protecting a total of 8.4 million acres. The goal of this integrated interagency program is to achieve a more efficient, effective and integrated interagency fire management program on lands administered and protected by each agency. The partnership encompasses all aspects of fire management including:

- Prevention
- Planning
- Training
- Preparedness
- Detection
- Fuels Management
- Use of Prescribed Fire
- Aviation Operations
- Safety
- Dispatch Operations

Lakeview Interagency Fire Center (LIFC) provides dispatch services for wildland suppression. All other services are provided by Lake County 911, except for code enforcement which is provided by Lake County and OSFM.

Lake County Fire Protection Districts



In addition to participation by federal and state agencies, the Lake County Fire Defense Board is comprised of Lake County Emergency management, New Pine Creek Fire Department, Lakeview Fire Department, Westside Fire Department, Paisley Fire Department, Silver Lake Fire Department, Christmas Valley Fire Department, Warner Valley RFPA and High Desert RFPA. For more detailed information refer to the SCOFMP website at <https://www.scofmp.org/>



Daniel Tague, Lake County Emergency Manager, Bootleg Fire

3.2 Rangeland Fire Protection Associations (RFPAs)

Lake County is home to three RFPAs: Warner Valley, High Desert and Wagonfire. High Desert RFPA covers an extensive area through the central portion of Lake County to the Crook County boundary. Warner Valley RFPA covers the southeastern portion of the County. Wagonfire RFPA is based in Lake and Harney counties respectively and provides wildland protection to portions of the eastern edge of Lake County and the western edge of Harney County. Protecting over 16 million acres of critical sage grouse habitat and working lands in Oregon, the RFPAs operate as independent associations of landowners that provide their own local wildfire protection. ODF supports the associations through administrative guidance, some administrative cost reimbursement, fire suppression training and facilitating access to federal grants and surplus firefighting equipment. RFPA fire prevention and suppression helps in conserving sage grouse habitat as well as safeguarding livestock forage crucial to the local economy. RFPAs operate under approval of the Oregon Board of Forestry and ODF per ORS Chapter 477.

RFPAs operate under ORS477-305 to provide wildfire protection on private lands within their jurisdiction and have contractual agreements with other fire protection agencies to provide wildfire response based on “closest resource”. RFPAs **do not** provide structure fire protection, although there seems to be widespread misconception on that with the general public. RFPAs operate as nonprofit corporations with volunteer membership. Dues and grant monies are sources of funding.

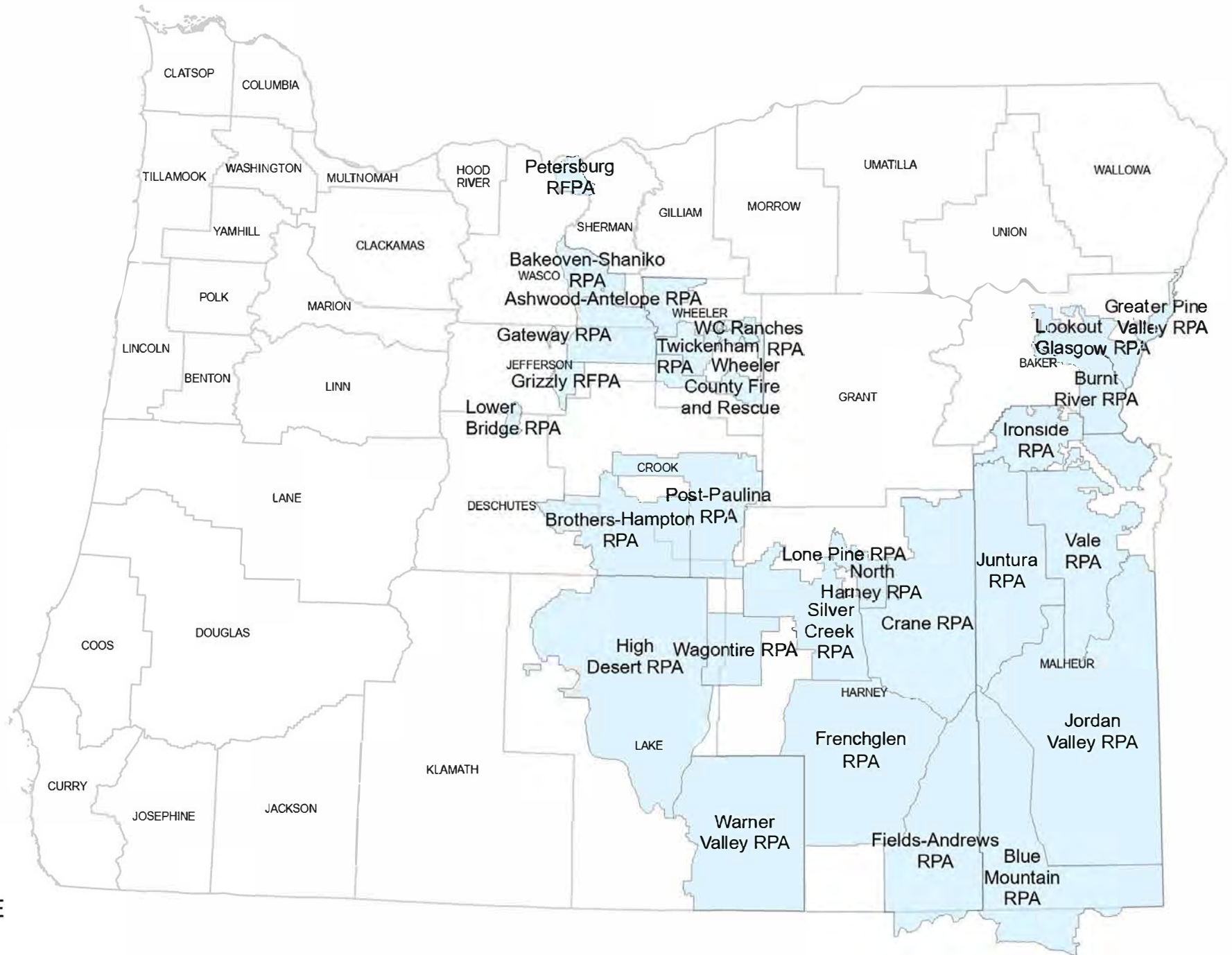


Warner Valley and High Desert RFPAs provide fire suppression services on the Brattain Fire in the photos below.

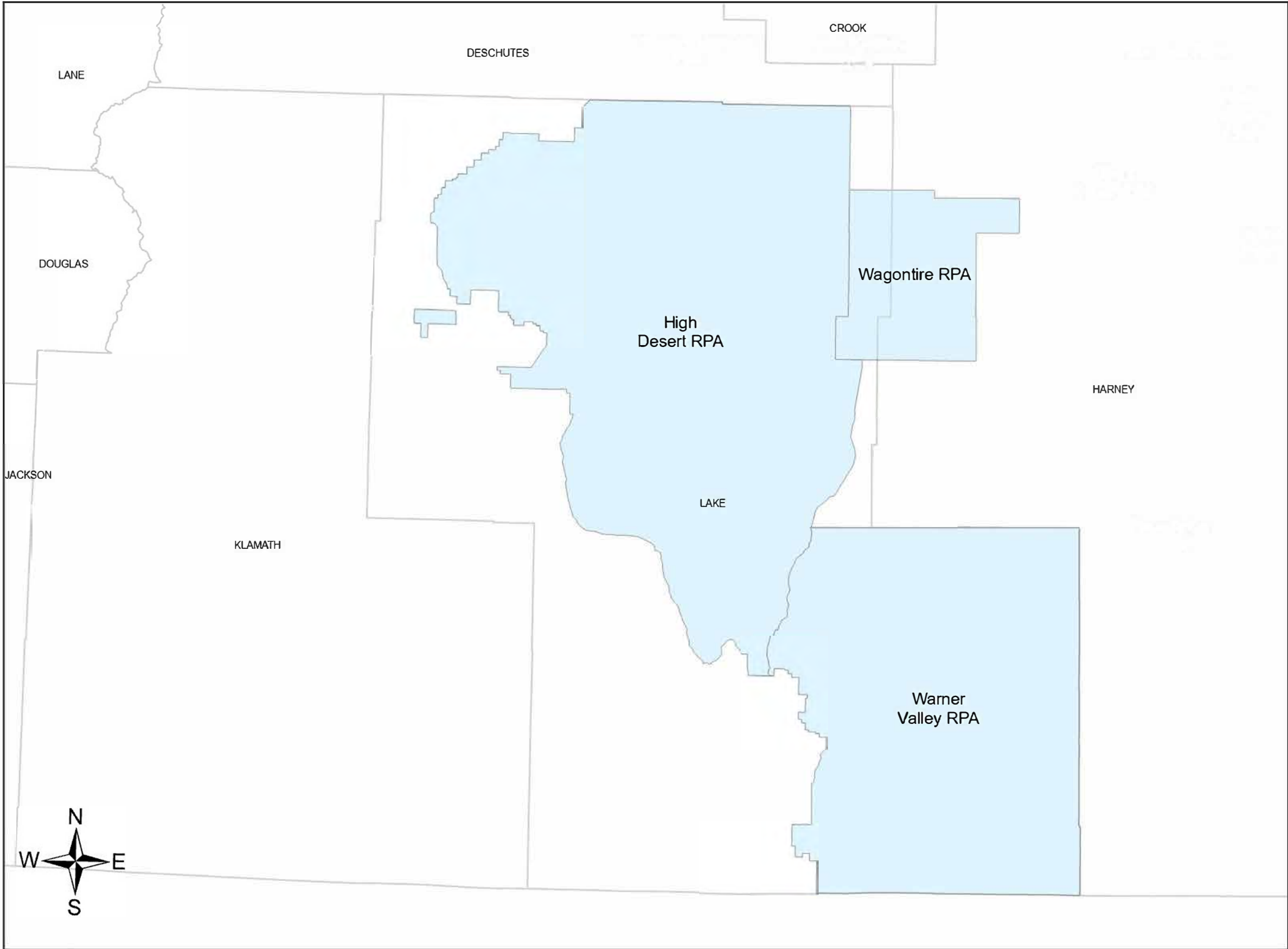


Warner Valley and High Desert RFPAs provide fire suppression services on the Brattain Fire in the photos above.

Oregon Rangeland Associations



Lake County Rangeland Associations



3.3 Lake County Emergency Management

Emergency Management and Search and Rescue are located under the Lake County Sheriff's department. In addition to the full suite of law enforcement duties, this department oversees Emergency Management planning and the Natural Hazards Mitigation Plan.

Information on Emergency Operations planning can be found here:

<https://www.oregon.gov/oem/hazardsprep/Pages/2-Weeks-Ready.aspx>

Information on Natural Hazards Mitigation planning can be found here:

https://www.lakecountyor.org/natural_hazards_mitigation_plan.php

3.4 Lake County Public Health

The mission of Lake County Public Health is to build a healthy community and promote health equity for all people through prevention and education. Offices are located in Lakeview and Christmas Valley.

3.5 Klamath Lake Forest Health Partnership

Klamath Lake Forest Health Partnership (KLFHP) was formed in 1993. A group of private landowners, forestry consultants, conservation groups, local fire districts, and state and federal agencies formed the partnership with a mission to promote forest health and awareness in Klamath and Lake Counties of Oregon. KLFHP achieves this mission through partnerships, problem-solving and science, and support and promotion of appropriate project implementation.

KLFHP developed a strategic, accelerated restoration and priority landscape framework for Klamath and Lake Counties with a consolidated framework of existing efforts within all land ownerships. This effort included identifying priority landscapes; coordinating communications; and facilitating outreach. This partnership continues to promote public and landowner education and support the use of current best science. KLFHP works to identify potential funding sources for cross boundary and landscape projects. (klfhp.org)

KLFHP has been a leader in Oregon with fuel reduction projects accomplished through various creative and forward-thinking means including the Good Neighbor Authority (GNA) program; large scale stewardship projects such as G – Z on the Fremont-Winema National Forest; partnerships with rural fire departments in Chiloquin with Joint Chief's funding; and recently the utilization of nonprofit partner organizations used to prep planning areas for sale. The Paradise project will encompass approximately 100,000 acres and focus on treating the unburned lands between Bootleg Fire and the Fremont-Winema National Forest boundary on the south. Implementation is planned for 2025. Numerous other fuel reduction and cross boundary projects, such as in various stages of planning and implementation, will be implemented in the future.

KLFHP has been instrumental in the revision and construction of this updated Lake County CWPP effort.

4 CWPP PROCESS

4.1 Lake County CWPP Requirements

The steps for developing a CWPP:

- Convene Decision Makers – Form a core team made up of representatives from local governments, fire authorities, and Oregon Department of Forestry.
- Involve Federal Agencies – Engage local representatives from the BLM, USFS, USFWS, and other land management agencies as appropriate.
- Engage Interested Parties – Contact and encourage participation from a broad range of interested organizations and community stakeholders.
- Establish a Community Base Map – Develop a County base map that identifies cities, transportation systems, and land ownerships
- Establish Wildland Urban interface/Intermix (WUI)
- Develop a Community Risk Assessment that identifies fuel hazards, critical infrastructure, values at risk, and community preparedness capability.
- Establish Community Priorities and Recommendations
- Develop and Action Plan and Assessment Strategy
- Finalize CWPP



Jesse Morris at left presenting at the CWPP meeting in Paisley at the Community Center on July 6, 2024.

4.2 Lake County Core Team

Core Team Members		
Team Member	Organization	Email
Jesse Morris	Lakeview Fire Department Chief/Lakeview BLM	jhmorris@blm.gov
Coley Neider	Fire Staff Officer/ Fremont- Winema National Forest	kenneth.neider@usda.gov
Daniel Tague	Lake County Emergency Manager	dtague@co.lake.or.us
Judy Clarke	Public Health Emergency Preparedness Coordinator	jclarke@lakehealthdistrict.org
Amy Markus	Partnership Coordinator Fremont-Winema National Forest	amy.markus@usda.gov
Barry Shullanberger	Lake County Commissioner	bshullanberger@co.lake.or.us
Kevin Burdon	ODF Lakeview Unit Forester	kevin.j.burdon@odf.oregon.gov
Teresa Vonn	Fire Risk Reduction Specialist	teresa.vonn@osfm.oregon.gov
Irene Jerome	Contractor/CWPP Writer	ijeromejnc@gmail.com

5 WILDFIRE RISK ASSESSMENT

5.1 Wildfire History

Historically, the dominant disturbance on the eastern slope of the Cascade Mountains, in the North Warner Mountains and across the vast rangelands of Lake County was low intensity and high frequency fire events burning across the landscape. A focus on fire suppression has, and continues, to impact what our forests and grasslands look like and how they function in this area.

Lake County is a fire adapted ecosystem. Traditionally wildfires occurred from lightning and Native American ignitions sources and the natural fire regime is the role that fire would play across a landscape in the absence of modern human interventions. Historical fire regimes are based on an average number of years between fires known as “fire frequency” combined with “fire severity” which is the amount of dominant overstory vegetation killed or damaged.

Fire risk is the probability that wildfire will start from natural or human-caused ignitions. Fire hazard is the presence of ignitable fuel coupled with the influences of terrain and weather. The nature of fuels, terrain, and weather conditions combine to dictate fire behavior, rate of spread, and intensity. Wildland fuel attributes refer to both dead and live vegetation and include such factors as density, fuel depth, continuity, loading, vertical arrangement, and moisture content. Structures are also a fuel source. Fire tends to burn more rapidly and intensely upslope than on level terrain. However, evening sundowner winds may rapidly drive wildfire downslope.

5.2 Lake County WUI Designation

This updated version of the CWPP designates and prioritizes fuel reduction throughout the County where homes, main travel routes and critical infrastructure are present as WUI. The objectives of the plan remain to reduce the risk of fire to life, property, economic, historic, cultural, natural resources and critical infrastructure in the County. The Wildland Urban Interface/Intermix boundaries will be six miles on each side of major highways and the Bear Flat Road; three miles on each side of secondary and major Forest Service roads (two digit); and one mile on each side of other roads. The potential operational delineations (PODs) and potential control lines (PCLs) concepts will be utilized to define other Values at Risk. The Risk Management Assessment (RMA) dashboard provides accurate real-time information and will be utilized for this purpose.

5.3 Approach to Wildfire Risk Assessment

Wildfire risk is the likelihood of a fire occurring, the associated fire behavior (fire intensity), and the impacts of the fire. The likelihood of fire occurring in Lake County is high. Wildfire risk is the likelihood of a fire occurring, the associated fire behavior (fire intensity), and the impacts of the fire. The likelihood of fire occurring in Lake County is high. A large fire, such as the 2024 Warner Peak Fire on the Sheldon-Hart Wildlife Refuge, has significant impacts on the entire County. The scale of impact is usually proportional to the size and severity of the fire. Risk cannot be removed from this or any landscape, but management actions can reduce risk and the scale of the impact is usually proportional to the size and severity of the fires. Risk cannot be

removed from this or any landscape, but management actions can reduce risk.

The CORE Team chose to utilize the Risk Management Assessment (RMA) Dashboard to identify and prioritize hazardous fuels, WUI and critical infrastructure. Three public meetings were held, one in Lakeview on July 5, 2024, which had marginal attendance and participation. A second meeting was held in Paisley on July 6, 2024, which had better attendance and participation, and one in Christmas Valley on July 6, 2024 which had good attendance and participation. Three follow-up meetings were held, one with John O’Keefe, Warner Valley RFPA Fire Chief, and one with Jim and Brenda Baldwin who own the Morgan Ranch near Paisley, and one with Travis Erickson, Collins Company.

An informational fire prevention film was shown at the Alger Theater in Lakeview on July 20, 2024. Public questionnaires on wildfire awareness were distributed at the theatre, left in the libraries in Lakeview and Christmas Valley and left at the incident command center for the Warner Peak Fire. All meetings provided information and added value to the CWPP process and development. Based on those meetings, the Core Team will continue to do community outreach throughout the year, using a variety of different venues to help better determine public opinion and perception of wildfire risk in Lake County. A general, and relatively widespread perception is, that because the County is not heavily forested where most of the population is located, the risk of loss of homes and other infrastructure to wildfire is minimal. The Core Team will work to provide more information and education to help residents better understand the nature and risk of wildfire in various settings.

Oregon Wildfire Risk Explorer (OWRE)– Advanced Report for Lake County also was utilized at a landscape level to evaluate fire history, current fire environment, fire model inputs and fuelsapes. The full report for Lake County is available in Appendix C.

Ultimately, there is high to extreme potential for wildfire affecting both the built and natural environment throughout the County. Approximately 23 percent of Lake County supports coniferous forest (excluding western juniper) with the remaining 77 percent of the landscape composed of agricultural and rangelands. Under certain conditions, such as high winds and low humidities, range fires can move extremely rapidly across the landscape making them very challenging for control and containment. The OWRE report for community wildland urban interface hazard predicts that approximately 127,325 acres are at high risk of impact from wildfire. This acreage includes the communities of Lakeview, New Pine Creek, Westside, Drews Gap, Paisley, Summer Lake, Silver Lake, Christmas Valley, Fort Rock and other areas where scattered dwellings and infrastructure are clustered together (OWRE page 5). Burn probability is rated “Very High and High-Very High” (OWRE p. 16) over about 46 percent of the County.

The Core Team was united in its vision of finding ways to pre-plan for fire by utilizing tools to establish landscape scale wildfire response options. Utilizing the RMA dashboard and

identifying where heavy or dangerous fuels coincide with Potential Control Locations (PCLs) before fire season allows for preemptive fuel treatments and ensuring these corridors function as safe tactical spaces for emergency response personnel. These Potential Operational Delineations (PODs) are valuable for thinking about the landscape as a whole and how to best address hazards and fuels are distributed. The POD concept was used in southwest Oregon several years ago by fire incident management teams to issue evacuation notices and more, and was found to be very effective.

5.4 Homes and Structures in the WUI

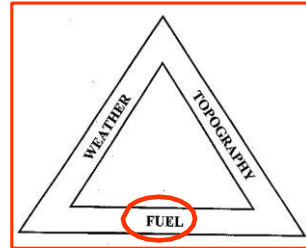
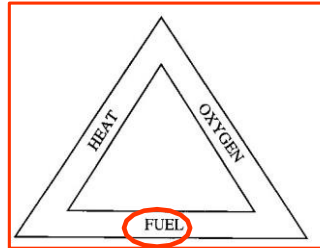
Historically, Lake County was managed naturally by fire and is considered a *fire prone landscape*. Whether caused naturally or by humans, fires are a regular occurrence and are projected to become more frequent in the future. As our communities continue to grow, more people and more homes are exposed in these high fire prone areas. Longer fire seasons, extreme fire behaviors, and huge losses to both the natural and to the built environment have occurred over the last decade.

The good news is that unlike floods, hurricanes or earthquakes, there are simple and often inexpensive ways to make our homes, lands, and communities safer from wildfire. With a good understanding of wildfire hazards, what causes homes to burn, and mitigation strategies, community residents can effectively lower the wildfire risk and losses to their homes and neighborhoods - and improve their land's health at the same time. Wildfire does not stop at a property's boundaries – and in order to prepare our lands to withstand a wildfire – we need to be managing for wildfire across ownership boundaries.

Homes, barns, other structures and improvements are “*fuel*” to a fire. Understanding what causes structures to burn is critical to prepare for fire. Three things are required for fire to burn:



And three factors determine how a fire burns on the landscape: Climate, topography and vegetation.



Wildfire in Grant County. Complicated topography influenced wildfire behavior; evening downslope winds and heavy fuels also influenced fire behavior. Although this barn did not burn, the potential for loss was high.



This home in north Central Oregon (Wheeler County area) would have burned if the firefighter who took the picture had not extinguished the fire.

5.5 Wildfire Risk to Communities

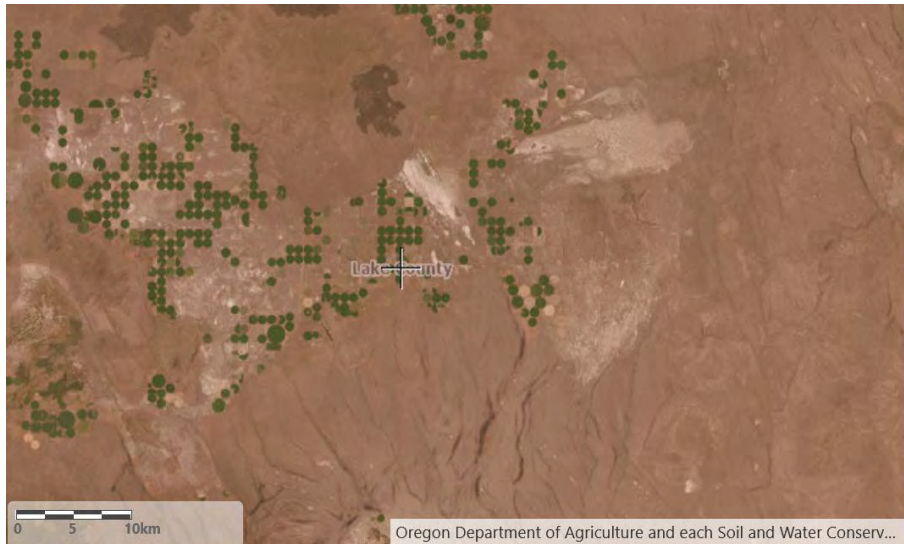
Wildfire risk to the various communities in Lake County is very real with the potential to be significant. As discussed above, topography, weather patterns and fuel densities and types influence fire behavior.

Community Hazard Ratings

The community hazard ratings below are based on the OWRE Advanced Report for Lake County page 5. The OWRE can be found in Appendix A.

- **Adel-High** Heavy fuels of dried grass, sagebrush, and weeds occur around many of the structures and improvements around the towns. Some homes have combustible siding, some have combustible roofs, support combustible materials of various types directly adjacent to structures and lack defensible space of safe firefighting next to home. Depending on where a fire started and what the conditions were, flames could move rapidly through these communities.
- **Alkali Lake- Low** Alkali Lake has a relatively low risk from wildfire. Grasses and vegetation tend to be light and structures are directly adjacent to Highway 395.
- **Christmas Valley/Fort Rock- High** Sagebrush, heavy dried grasses, weeds and miscellaneous accumulations of personal belongings close or directly adjacent to structures. Not only can these items carry fire to the structure(s) they pose unsafe conditions for structure and wildland firefighters. Surrounding terrain, lack of defensible space around some structures, limited emergency ingress and egress add to the risk. Many structures are composed of combustible materials. Dwellings and residential

structures have been increasing in this area as has the number of fires.



Aerial view of Christmas Valley area – notice the large patchwork of green areas from irrigation. When private landowners are interested opportunities may be present to utilize water from irrigation systems during wildfire emergencies. Adaptive equipment may be necessary.

area is subject to numerous fire starts from powerlines. While the area is surrounded by many green fields irrigated with large expensive pivot systems, the diverse populations and scattered structures create significant vulnerabilities.

- **Drews Reservoir/Drews Gap/Quartz Mountain – HIGH** Juniper, ponderosa pine, sagebrush, dried grass, weeds close to structures and around the area. Surrounding terrain, lack of defensible space around some structures, limited emergency ingress and egress. Combustible materials on some structures. No structure protection. Residential structures have been increasing in this area and the number of fires, sometimes started by travelers on the highway, that threaten structures has significantly increased over the last several years.
- **Lakeview Area – HIGH** - Although structure fire protection is available, these communities are at high risk of loss from fire. Heavy fuels of dried grass, sagebrush, juniper and weeds occur around town. Many homes have combustible siding, some have combustible roofs, support combustible materials of various types directly adjacent to structures and lack defensible space of safe firefighting next to home. Depending on where a fire occurred, winds could push flames through the city. Narrow streets with one way in and one way out occur in some areas. One house fire ties up the department. All departments in the County are small, strapped for volunteers, and must work closely together. In the event of ember showers and the potential for additional ignitions, these areas are very vulnerable. Highway 395 is a major north-south route through eastern Oregon that crosses Lake County. Fires from travelers are on the increase along these travel ways.

The area east of Highway 395 and north of Lakeview has numerous homes, ranches, and improvements interspersed amid juniper, ponderosa pine, and sagebrush.

The photo below of Highway 140 facing east, shows the heavy vegetation where many residents are now choosing to construct homes. While this area is close to numerous fire response entities/agencies, it is at risk if atypical conditions or situations arise. Note the dwellings in the center of the photo.



- **New Pine Creek High** Heavy stands of juniper near town and surrounding area. sagebrush, dried grass, weeds close to structures and around the area. Surrounding terrain, lack of defensible space around some structures, limited emergency ingress and egress and combustible materials on some structures make the town vulnerable.
- **Paisley–High** Heavy stands of juniper near town and surrounding area. sagebrush, dried grass, weeds close to structures and around the area. Surrounding terrain, lack of defensible space around some structures, limited emergency ingress and egress and combustible materials on some structures make the town vulnerable.
- **Plush -High** Heavy stands of juniper near town and surrounding area. sagebrush, dried grass, weeds close to structures and around the area. Surrounding terrain, lack of defensible space around some structures, limited emergency ingress and egress and combustible materials on some structures make the town vulnerable. Lack of cellular phone service is a critical issue.
- **Summer Lake/Ana Estates High** Dried grass, sagebrush, weeds in proximity to structures and around the area. Surrounding terrain, evening downslope winds, lack of structure defensible space, combustible materials on some structures, limited emergency ingress and egress. No structure fire protection.

- **Silver Lake –High** Dried grass, sagebrush, juniper, weeds in proximity to structures and around the area. lack of structure defensible space, combustible materials on some structures.
- **Valley Falls — High** Dried grass, sagebrush, weeds in proximity to structures and around the area. Lack of defensible space around some structures. No structure protection. Highway 31 and Highway 395 are major east-west and north-south routes through eastern Oregon that cross Lake County. Fires from travelers are on the increase along these travel ways.

5.6 Wildfire Risk to Structures in Rural Areas

Wildfire risk to scattered homes and structures around the County is extreme, especially those where wildland fire protection has long distances to cover for response. There is no structure protection in many of these areas. Scattered homes occur throughout the County, including in the forested areas primarily along the western boundary of the County. All of these homes are vulnerable to wildfire and the responsibility for creating defensible space, identifying evacuation routes, and preparing for wildfire is largely up to the individual homeowners. Landowners and homeowners have a responsibility to prepare their homes and assets for the eventuality of wildfire. Expertise is available from SCOFMP to provide guidance and make suggestions. Occasionally, monies are available to the public as well.



6 WILDFIRE MITIGATION PLAN

6.1 Approach to Mitigation Planning

Mitigation to prevent damage from wildfires can reduce the loss of structures and other important community values. Fuels and non-fuels mitigation projects, establishment of critical infrastructure, and effective and frequent public outreach and education are essential. The mission statement for the CWPP is: *Reduce the risk from wildfire to life, property, historic and cultural sites, and natural resources; implement a robust and sustained prevention and education program for all citizens in the County; assist with resource management of lands within Lake County in a manner that benefits the local economy and local communities while maintaining, protecting and enhancing natural resources.* Based on the mission statement, the goals and objectives, and the overarching premise utilized in CRR, the updated Lake County CWPP will utilize a three-pronged strategy: Fuel Reduction, Prevention and Emergency Services.

There is a need to reduce hazardous fuels. Given the right conditions, wildlands will burn. However, treating fuels will not “fire-proof” the project area and it is not the goal of this CWPP to recommend excluding fire from the landscape. Ignition sources are prevalent, and fuels cannot, and should not, be totally eliminated. Therefore, hazardous fuels reduction treatments will be designed along potential control lines, infrastructure, and prescribed fire boundaries. Potential Control Lines (PCL's) are areas where large fires historically tend to stop or lull due to topographic features such as lakes, ridges, and rivers; roads and trails; fuel transitions; and non-burnable vegetation. Currently, fuels along many of these PCL's are conducive to high fire intensities. The RMA dashboard is routinely updated and provides up to date data and information on various factors including the level of hazardous fuels.

Fuelbreaks along these PCLs are needed to reduce fire behavior and resistance to control. Depending on the fuel type the fire is burning in, such as forestlands versus rangelands, fire behavior is reduced by decreasing surface fuels, ladder fuels, crown density and retaining large trees. Fuelbreaks will reduce the risk to firefighters when they engage wildfire and reduce the risk of escape when managing natural or prescribed fire. One fuelbreak size does not fit all locations. Many different approaches can be utilized in creating fuelbreaks including mechanical or hand reduction of fuels, prescribed burning and targeted grazing. Appropriate fuel treatments will be linked to the external factors and ecology of the site to the extent possible.

6.2 Fuel Reduction

The potential for a wildfire to start on public or private lands and burn onto private or public lands respectively is high in Lake County. The County has frequent lightning storms during the spring, summer and fall months that may or may not be accompanied with moisture. The overwhelming abundance of grasses, both non-native and native, along with sagebrush and juniper over much of the County allows for rapid fire ignition and rapid fire growth if vegetative

moisture levels, relative humidities, temperatures and winds or some combination thereof lend themselves to fire. Range fires tend to burn extremely rapidly and can cover large amounts of ground in short time frames. Therefore, utilizing equipment such as a skid steer with masticator head, and mower, is needed to manage fuels near homes and structures.

The reduction of hazardous fuel buildups is a critical element of reducing unwanted wildfire hazards and extreme fire behaviors. Communities, homeowners, and many private lands are at risk from wildfire due to hazardous fuels buildups. The appropriate reduction and treatment of hazardous fuels, in combination with a proactive maintenance plan, is extremely important for Lake County. Government entities and County residents must work together to identify and implement strategic areas and actions to effectively reduce fuels on the ground, ideally in combination with PCLs. In many cases, this may require cross boundary partnerships between federal, state and private entities.

The Eastern Oregon Agricultural Research Center and partners have been working diligently on opportunities to prioritize and coordinate activities at landscape scales to address threats to ecosystem resilience including large wildfires and invading annual grasses. (OSU Forestry & Natural Resources Newsletter, Winter 2023)

6.3 Prevention

Lake County has a strong and engaged cadre of individuals and organizations committed to keeping fire prevention and education at the forefront of discussions on wildfire. In the words of Confucius “Success depends upon previous preparation, and without such preparation there is sure to be failure”. Or in simpler terms, an “ounce of prevention is worth a pound of cure”. Development of a robust and sustained prevention and education effort to be implemented County-wide will result from discussions of the Core Team in the Lake CWPP. SCOFMP is strongly committed to fire prevention and all the agencies have fire prevention tools and messaging that is shared with landowners and the public. The Fire Defense Board meetings serve as fire prevention meetings for Lake County, however a dedicated “Fire Prevention Cooperative” would be advantageous for focusing on education and prevention in the County.

All agencies have fire prevention programs in place. ODF does not have a “Community Wildfire Forester” in Lake County and the addition of this position would be extremely valuable for County landowners and the agency. An individual devoted to fire prevention activities and grant writing at the County level is needed as well.

Information needs to be provided for residents who live in areas with no structure fire protection. Many residents may not know the difference between structure and wildland fire protection and this information must be provided and reinforced. An increasing number of residents have moved from more urban areas with numerous emergency services, to Lake

County where distances are vast, response times long, and the majority of emergency services are staffed by volunteers.

Highway fires are common and the Core Team has underscored the need to emphasize prevention messaging and strategies along these travel corridors.

Anecdotal evidence, gathered at various public events in rural central and eastern Oregon counties has revealed that many residents do not believe “wildfire” will impact their residence because:

- They don’t live in a forested environment
- They live in town and have a city fire department



Photos above from Cougar Peak Fire.

7 CWPP IMPLEMENTATION

7.1 Approach to Implementation

Mitigation of wildfire is a means of reducing the potential damage or loss of structures and other important community values to unintended fire. Management of hazardous fuels, home and structure hardening, public outreach, prevention and education, vigorous and engaged emergency services are all ways to help mitigate the risk of loss from wildfire. While all these elements are in place in Lake County, the updated CWPP seeks to provide additional guidance and identify emphasis areas. Providing homeowners and landowners with the knowledge and tools to help themselves is critical as firefighters may not arrive. To be most effective in reducing wildfire risk cooperation among the various agencies and private landowners is critical as wildfire does not recognize ownership boundaries. It is incumbent on homeowners and landowners to take responsibility since there is only so much fire authorities can do to protect individual life and property from wildfire in a large very rural county.

7.2 Suggested Actions and Processes

Defensible space provides a fuelbreak to reduce the rate of fire spread and intensity so that firefighters can safely maneuver around homes and/or the fire may burnout. The information below is directly from the National Fire Protection Association's Firewise website:

<https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Preparing-homes-for-wildfire>

The concept of defensible space is predicated on the arrival of firefighters or other emergency service personnel to protect the structure while "survivable" describes a structure that has a good chance of surviving even if firefighters do not arrive. Given the very rural nature of Lake County, with its vast distances and limited emergency personnel, it is important for homeowners to work toward preparing their homes to be "survivable". There is a possibility that here may not be firefighters on site to protect the structure in the event of wildfire. Home ignition zone assessments by qualified personnel can help homeowners with suggestions on how to make their homes "survivable". Homeowners can request home ignition zone assessments from ODF or other SCOFMP agencies.

Access and Evacuation Routes:

Adequate access for emergency response vehicles is critical during any type of incident including wildfire. Many rural roads, and some streets in towns, are one lane in and out of the property. Locked gates in the outlying areas are not uncommon. Access issues, including road width, length, turn around opportunities and locked gates need to be identified and documented. Although many areas in Lake County support only one road in and one road out, it is important to work with the public to think about an alternative route if the need to evacuate arises and the primary access is not available for exit.

Hazardous Fuels Management:

Implementing a wide variety of strategies to manage and reduce hazardous fuels is a primary focus of the CWPP. Numerous strategies, tools and partners are available and accessible including but certainly not limited to:

- Mechanical treatments such as slash busters or mechanical cutting and piling.
- Prescribed burning.
- Grazing has been vastly underutilized historically due to federal requirements, environmental analysis hurdles, and more. Working with federal and state agencies, collaboratives, and interested citizens to better understand and utilize this tool will help move the landscape to a better condition as well as provide economic benefits to landowners and the County. Tools such as “targeted grazing” can be used to create fuelbreaks, defensible space, and more. “Virtual fencing” is a relatively new technology, that allows ranchers to control livestock distribution in rangeland landscapes without physical fences. Prescriptive grazing is one of the tools that will move the landscape back toward a bunchgrass fine fuels condition. Livestock grazing in forested areas will help create a more open “park-like” environment as well as help knock down ladder fuels. Allowing more flexibility to the grazing permit process will help achieve these goals as well as aiding ranchers.

Water Resources:

Lake County supports various streams, ponds, lakes and irrigation systems that are available as water sources during a wildfire suppression emergency. However, a focused strategy to establish additional water resources throughout the County is another primary goal of this CWPP. Adding water resources for various uses including wildfire suppression would be very valuable. For example, identifying potential sites for solar pumps with tanks, and spring developments.

A primary opportunity currently exists for developing a pond near Crane Creek on private property. The pond would serve as a tanker fill and helicopter dip site as well as a water site for livestock.

Emergency Response:

Improving the infrastructure of existing fire protection authorities will improve response times to incidents. The quality of wildland fire response is dependent on staff training, equipment, facilities, distance to fire, and personnel. SCOFMP will continue and look for areas to improve cooperation and communication among federal, state, County and city emergency services, RFPAs and private landowners.

Preplanning:

Lake County Fire Defense Board has consistently expressed the need to develop “preplans” to be prepared in the event of a major conflagration or other natural disaster that requires evacuation of cities and settlements. Being prepared in advance has proven to be extremely valuable during emergencies to help save life and property.

Apparatus, Equipment, Supplies and Training:

Operating and maintaining emergency services such as city fire departments and ambulance services, RFPAs, communications systems is expensive and complex. These services must have access to appropriate equipment, apparatus, PPE, communications systems, training and the financial means to attain those assets either through grants or other means. Volunteers are extremely difficult to recruit in the current environment. All departments are constantly in need of engines of all types, generators, saws, radios, boosters, communication systems, and PPE.

Home Ignition Zone Assessments:

Initiate a program to perform home ignition zone assessments (HIZ) throughout the towns and around the County to help inform fire professionals and to provide education and information to homeowners on improvements they can implement. Develop a plan to initiate HIZ assessments throughout the rural areas of the County to provide education and information to homeowners on improvements they can implement in these areas that have no structure protection.

Prevention:

Emergency response personnel in the County, including the federal and state agencies, have been proactively engaging in various prevention activities. Prevention messaging requires using every opportunity and as many mediums as possible to get the message out. Consider establishment of a dedicated fire prevention cooperative.

Education:

Annual programs on fire prevention, evacuation, life safety and more are delivered into the school systems will be implemented. New and different opportunities for fire prevention messaging will be taken advantage of as opportunities arise.

Insurance:

Obtaining and keeping homeowners insurance in wildfire prone areas is becoming increasingly difficult. Cancellations are becoming more common. Homeowners and potential homeowners in these areas need to discuss this possibility with their insurance agents. Research on insurance availability is critical when purchasing land in these rural areas for homes or second homes. Potential buyers need to clearly understand what type of fire protection, structure or wildland or both, want to locate.

Community Involvement:

Engaging the County residents in fire prevention at every opportunity is critical and one of the keys to creating fire adapted landscapes. Grassroots groups and support at the ground level are extremely effective at spreading the word and building support. County Emergency personnel and the Lake County Fire Defense Board will seek opportunities with interested communities to introduce the Firewise Community and Fire Safe Council concepts.

7.3 Hazardous Fuel & Proposed Projects and Prioritization

The proposed hazardous fuel reduction projects for Lake County can be found in detail in Appendix G.

8 LAKE COUNTY CWPP MONITORING AND EVALUATION

8.1 CWPP Plan Adoption

The Lake County Core Team met several times to discuss process and plan the CWPP revision. Interest and input from the general population in Lake County has been minimal, however the Core Team will continue to solicit public input. There is agreement from the Core Team that this is a “*living plan*” which will be reviewed and updated annually as necessary. Public input will always be routinely sought and welcome.

8.2 CWPP Implementation

The mission statement for the CWPP in Lake County is:

Reduce the risk from wildfire to life, property, historic and cultural sites, and natural resources; implement robust and sustained prevention and education program for all citizens in the County; assist with resource management of lands within Lake County in a manner that benefits the local economy and local communities while maintaining, protecting, and enhancing natural resources.

Implementing and sustaining the CWPP is fundamental to the success of this effort. The Core Team is responsible for the ongoing efforts and will meet annually to document successes from the previous year including number of acres that underwent fuel mitigation, home ignition zone assessments conducted, improvements and equipment acquired by emergency responders, and other relevant accomplishments. Potential activities for upcoming and outyears will be developed. The Core Team will be responsible for CWPP monitoring and evaluation throughout the year.

Based on the three-pronged strategy that will be utilized for the CWPP the following recommendations are provided:

Fuels Reduction

- Create fuel breaks, with an annual maintenance plan, around all established communities in the County.
- Establish a “mitigation crew” to plan and implement fuel breaks and treatments on private land, utilizing cross boundary projects when possible.
- Help private landowners with slash treatments such as pile burning, biomass treatments or other options.
- Develop and implement a program to treat invasive weeds on the landscape.

Emergency Services

- Develop fire emergency “preplans” in all other areas of the County to prepare for evacuation.
- Establish point protection zone around critical infrastructure.
- Develop additional water sources, including some available all year.
- Map and maintain an existing water sources and create a readily accessible inventory available to all first response agencies.
- Construct a water source on Little Crane Creek for a helicopter dip site and tanker fill.
- Improve communications infrastructure, including the establishment of a cell tower in Plush, to enhance interoperability between response agencies and adjacent counties.
- Identify solutions to improve cellular and data service.
- Identify and improve road access to high-risk areas.
- Provide interagency training opportunities within the County.
- Work to integrate all agencies into incident response to improve local capacity.
- Establish community resource “advisors” or “liaisons” who have sound knowledge of local road systems, weather patterns and other pertinent information during large scale events to represent affected communities.
- Advise potentially affected residents if “back burns” may be set on their property during large scale wildfire events.

Prevention and Education

- Hire or contract with an individual to provide fire prevention services for the County.
- Hire ODF Community Wildfire Forester.
- Work to establish County fire prevention messaging that is consistent across agencies and entities.
- Work with residents County-wide to promote understanding of *who to expect, and what actions they can perform*, in the event of wildfire and structure fire.
- Work with County planning department and local realtors to share information on County fire response, emergency services, and insurance services depending on location.
- Conduct home ignition zone assessments, including homes within incorporated cities, as opportunities arise.
- Work with all County residents to promote individual prevention and mitigation actions as a critical part of the solution, including concepts such as Fire Safe Councils, Firewise Communities, Fire Adapted Communities.
- Work with local nurseries to sell and advertise fire resistant plants.
- Establish a Fire Prevention Co-op to help with fire prevention and education messaging at every opportunity.
- Work with all areas of the County to inform residents of potential evacuation routes in

the event of fire or other emergencies.

- Engage community-based organizations to help with fire prevention and education messaging.
- Provide education and information on the benefits of prescribed fire.
- Work with local USFS , ODF, OSFM and local fire department personnel to provide more off road patrols and increased informational signage on fire prevention/conditions, etc.

Implementing and sustaining the CWPP is the key to success. Monitoring and managing this implementation is the responsibility of the Core Team. Building and maintaining partnerships among community-based organizations, fire protection authorities, local governments, land management agencies, and private landowners is critical in identifying and prioritizing measures to reduce wildfire risk. The CWPP encourages residents of the County to take an active role in identifying needs, developing strategies, and implementing solutions to address wildfire risk. The CORE group will meet annually to review and document accomplishments from the previous year, and to discuss planned accomplishments for the coming year as well as noting any minor revisions or updates needed in the CWPP. The CWPP is a “*Living*” document.

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Franklin, Jerry F. and C. T. Dyrness, *Natural Vegetation of Oregon and Washington*, USDA Forest Service, General Technical Report PNW-8, 1973

Oregon Wildfire Risk Explorer: [Oregon Explorer Topics | oregonexplorer | Oregon State University](#)

Wikipedia

A

Lake County Wildfire Explorer Risk
Headwaters Economics



A Profile of Wildfire Risk

Selected Geographies:
Lake County, OR

United States

Comparison Geographies:
U.S.

Produced by
Headwaters Economics'
Economic Profile System (EPS)
<https://headwaterseconomics.org/eps>

June 13, 2024

Wildfire Risk

Lake County, OR

About this report

This report presents data about wildfire risk, socioeconomic vulnerability, and land use to help communities understand their relative wildfire risk profile. It was created through a partnership between Headwaters Economics and the U.S. Forest Service through the Community Planning Assistance for Wildfire program using data from Wildfire Risk to Communities.



<https://wildfirerisk.org>

Wildfire Risk to Communities is a free, easy-to-use website with interactive maps, charts, and data to help communities in the United States understand, explore, and reduce wildfire risk. Wildfire Risk to Communities is a project of the USDA Forest Service, under the direction of Congress, in partnership with Rocky Mountain Research Station's Missoula Fire Sciences Laboratory, Pyrologix, and Headwaters Economics.



<https://cpaw.headwaterseconomics.org>

Community Planning Assistance for Wildfire (CPAW) works with communities to reduce wildfire risks through improved land use planning. CPAW provides communities with technical land use planning recommendations, hazard assessments, custom research, and training.

Project partners



<https://headwaterseconomics.org>

Headwaters Economics is an independent, nonprofit research group. Its mission is to improve community development and land management decisions.

Headwaters Economics provides original and effective research to help people and organizations develop solutions to some of the most urgent and important issues that communities face.



<https://www.fs.usda.gov/>

The Forest Service, an agency of the U.S. Department of Agriculture, administers national forests and grasslands encompassing 193 million acres.

The Forest Service's mission is to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations.

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Note to Users:

This is one of 14 reports that can be created and downloaded from EPS. Topics include land use, demographics, specific industry sectors, the role of non-labor income, the wildland-urban interface, the role of amenities in economic development, and payments to county governments from federal lands. The EPS reports are downloadable as Excel or PDF documents. See <https://headwaterseconomics.org/eps>.

Wildfire Risk

Lake County, OR

Relative Wildfire Risk

Lake County, OR

Statewide Percentile Rank

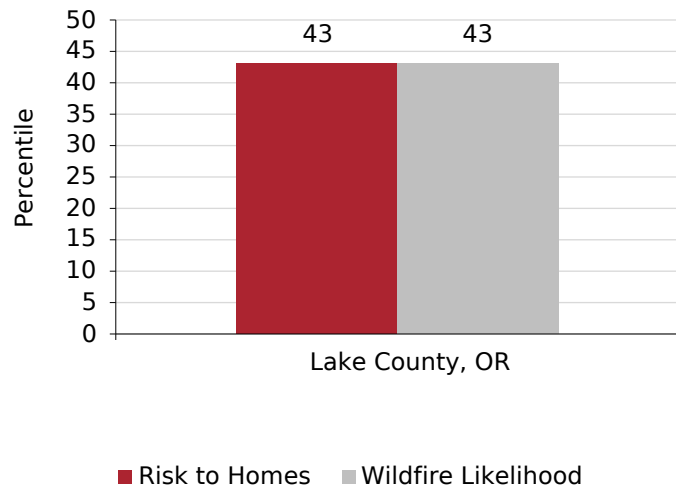
Risk to Homes	43
Wildfire Likelihood	43

Nationwide Percentile Rank

Risk to Homes	87
Wildfire Likelihood	87

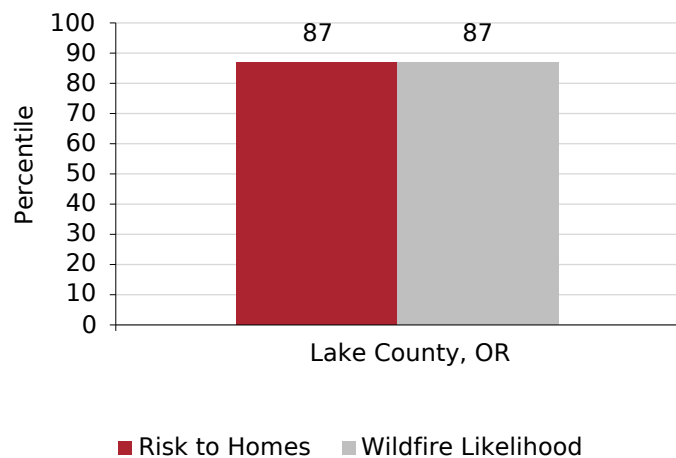
Relative Risk (0-100) Within State

- Populated areas in Lake County, OR have, on average, greater risk than 43% of counties in the state.
- Populated areas in Lake County, OR have, on average, greater wildfire likelihood than 43% of counties in the state.



Relative Risk (0-100) Within Nation

- Populated areas in Lake County, OR have, on average, greater risk than 87% of counties in the nation.
- Populated areas in Lake County, OR have, on average, greater wildfire likelihood than 87% of counties in the nation.



Wildfire Risk

Lake County, OR

Relative Wildfire Risk

What do we measure on this page?

Risk to Homes integrates wildfire likelihood (the probability of wildfire occurring) and wildfire intensity (the energy released by a wildfire) with expected consequences to homes if a fire occurs.

Wildfire Likelihood is the annual probability of a wildfire occurring in a specific location. At the community level, wildfire likelihood is averaged where housing units occur.

Both measures—Risk to Homes and Wildfire Likelihood—are shown as a percentile (or rank). If the place you selected is a community or county, the percentile is relative to all other communities or counties in the state (statewide rank) and the nation (nationwide rank). If the place you selected is a tribal area, the percentile is relative to all other tribal areas and counties. If the place you selected is a state, the percentile is relative to all other states.

Why is it important?

The Risk to Homes data pose the hypothetical question: "What would be the relative risk to a house if one existed here?" It asks that question whether a home actually exists at that location or not. This allows us to compare the wildfire risk in places where homes already exist to places where new construction may be proposed.

The Risk to Homes data integrate wildfire likelihood and wildfire intensity from simulation modeling. These two risk components represent wildfire hazard. To translate this into terms specific to the effect of fire on homes, this report uses a generalized concept of susceptibility for all homes as derived from *Wildfire Risk to Communities*.¹ In other words, it is assumed all homes that encounter wildfire will be damaged, and the degree of damage is directly related to wildfire intensity. The report does not account for homes that may have been mitigated.

In reality, an individual home's ability to survive wildfire is driven primarily by local conditions (known as the "home ignition zone"), including the construction materials and the vegetation in the immediate area. The only way to truly assess home susceptibility is through individual home assessments. Communities can reduce their risk to homes by reducing wildfire likelihood, wildfire intensity, exposure, and susceptibility. For example, fuel treatments may reduce wildfire likelihood or intensity, exposure may be reduced through land use planning tools, and susceptibility may be reduced by mitigating the home ignition zone, home hardening, and land use planning tools.

Wildfire Likelihood is based on fire behavior modeling across thousands of simulations of possible fire seasons. In each simulation, factors contributing to the probability of a fire occurring, including weather, topography, and ignitions are varied based on patterns derived from observations in recent decades. Wildfire Likelihood is not predictive and does not reflect any currently forecasted weather or fire danger conditions.

Wildfire likelihood is simply a probability that any specific location may experience wildfire in any given year. It does not say anything about the wildfire intensity if it occurs. Wildfire likelihood is difficult to modify but can be reduced through fuel treatment projects and ignition-prevention efforts.

Wildfire Risk

Lake County, OR

Wildfire Exposure

	Lake County, OR	United States
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Buildings Exposed

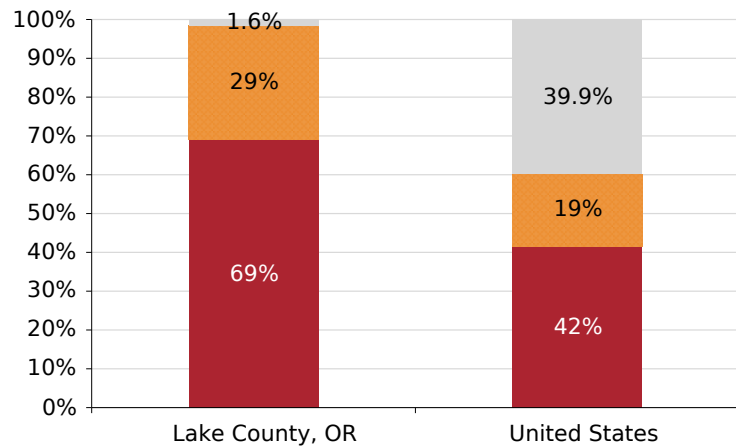
Buildings directly exposed	6,050	60,818,690
Buildings indirectly exposed	2,562	27,108,490
Buildings minimally exposed	139	58,361,363

Percent of Total

Buildings directly exposed	69.1%	41.6%
Buildings indirectly exposed	29.3%	18.5%
Buildings minimally exposed	1.6%	39.9%

Exposure of Buildings to Wildfire

- 69% of buildings in Lake County, OR are exposed to wildfire from direct sources, such as adjacent flammable vegetation.
- 29% of buildings in Lake County, OR are exposed to wildfire from indirect sources, such as embers or building-to-building ignition.



- Buildings directly exposed
- Buildings indirectly exposed
- Buildings minimally exposed

Wildfire Exposure

What do we measure on this page?

Wildfire Exposure is the spatial coincidence of wildfire likelihood (the probability of wildfire occurring) and wildfire intensity (the energy released by a wildfire) with communities.

Buildings that are minimally exposed are not likely to be subjected to wildfire. Buildings that are indirectly exposed may be subjected to wildfire from indirect sources such as embers and home-to-home ignition. Buildings that are directly exposed may be subjected to wildfire from adjacent flammable wildland vegetation, as well as from indirect sources.

Buildings include homes and other structures, such as commercial buildings.

Why is it important?

Effective wildfire risk reduction activities will vary depending on the type of exposure.

Where buildings are exposed to wildfire directly or indirectly, activities should include making structures ignition resistant, reducing places for embers to land and ignite.

Where buildings are directly exposed to wildfire, effective risk reduction activities will also reduce ways for vegetation to carry fire to homes, such as reducing hazardous fuels and creating defensible spaces to help anchor wildfire response activities.

At the community scale, land use planning strategies can help reduce wildfire exposure.

Wildfire Risk

Lake County, OR

Population Change

	Lake County, OR	United States
Population (2022*)	8,201	331,097,593
Population (2010*)	7,882	303,965,272
Population Change (2010*-2022*)	319	27,132,321
Population Pct. Change (2010*-2022*)	4.0%	8.9%

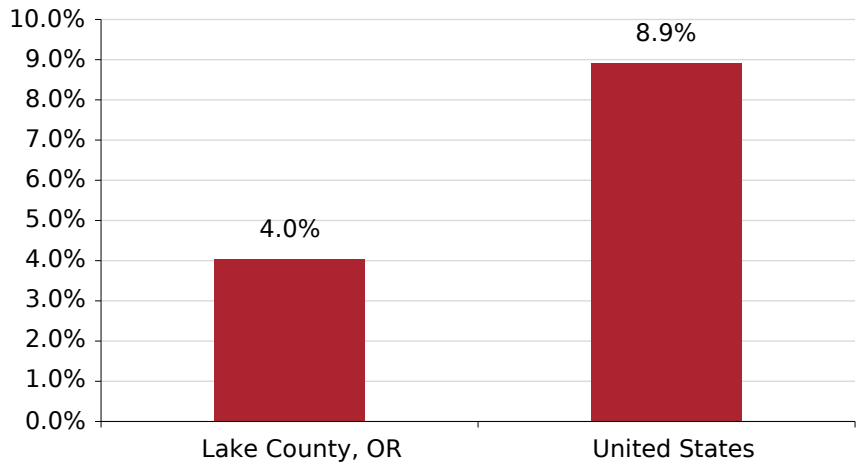
High Reliability: Data with coefficients of variation (CVs) < 12% are in black to indicate that the sampling error is relatively small.

Medium Reliability: Data with CVs between 12 & 40% are in orange to indicate that the values should be interpreted with caution.

Low Reliability: Data with CVs > 40% are displayed in red to indicate that the estimate is considered very unreliable.

Percent Change in Population, 2010*-2022*

- From 2010* to 2022*, Lake County, OR had the smallest estimated absolute change in population (319).
- From 2010* to 2022*, United States had the largest estimated relative change in population (8.9%), and Lake County, OR had the smallest (4.0%).



* ACS 5-year estimates used. 2022 represents average characteristics from 2018-2022; 2010 represents 2006-2010.

Data Sources: U.S. Department of Commerce. 2023. Census Bureau, American Community Survey Office, Washington, D.C.

Wildfire Risk

Lake County, OR

Population Change

What do we measure on this page?

This page describes the total population and change in total population.^{2, 3}

Data in this report comes from the U.S. Census Bureau's American Community Survey (ACS).⁴ The ACS is conducted nationwide every year by the U.S. Census Bureau to collect demographic, social, economic, and housing information. For more information about ACS data and accuracy, see the Data Sources & Methods section at the end of this report.

Why is it important?

Population growth is generally an indication of a healthy economy. No growth or long-term decline generally occur when an area is struggling. However, as population grows, more and more people are building homes on fire-prone lands.

Since 2010, 34% of single-family homes are located in the wildland-urban interface (WUI). The WUI is the fastest-growing type of land use in the conterminous United States, increasing by 145% from 1990 to 2015. Today nearly half of the U.S. population lives in the WUI.⁵

Another consequence of population growth is the possibility of more fire ignitions. Almost all wildfires (97%) in the WUI are caused by people. Human-caused wildfires are responsible for 92% of the wildfires that threaten structures, which is 30 times more than lightning-caused wildfires.⁶

CHANGES IN BOUNDARIES: Data describing change over time can be misleading when geographic boundaries have changed. The Census provides documentation about changes in boundaries at this site: www.census.gov/geo/reference/boundary-changes.html

Wildfire Risk

Lake County, OR

Race & Ethnicity

Race and Ethnicity, 2022*	Lake County, OR	United States
Total Population	8,201	331,097,593
White alone	7,169	218,123,424
Black or African American alone	21	41,288,572
American Indian alone	169	2,786,431
Asian alone	71	19,112,979
Native Hawaii & Other Pacific Is. alone	0	624,863
Some other race alone	72	20,018,544
Two or more races	699	29,142,780
Hispanic or Latino (of any race)	774	61,755,866
Not Hispanic or Latino	7,427	269,341,727
Not Hispanic & White alone	6,741	194,886,464
People of Color and Hispanic*	1,460	136,211,129

Percent of Total

White alone	87.4%	65.9%
Black or African American alone	0.3%	12.5%
American Indian alone	2.1%	0.8%
Asian alone	0.9%	5.8%
Native Hawaii & Other Pacific Is. alone	0.0%	0.2%
Some other race alone	0.9%	6.0%
Two or more races	8.5%	8.8%
Hispanic or Latino (of any race)	9.4%	18.7%
Not Hispanic or Latino	90.6%	81.3%
Not Hispanic & White alone	82.2%	58.9%
People of Color and Hispanic*	17.8%	41.1%

High Reliability: Data with coefficients of variation (CVs) < 12% are in black to indicate that the sampling error is relatively small.

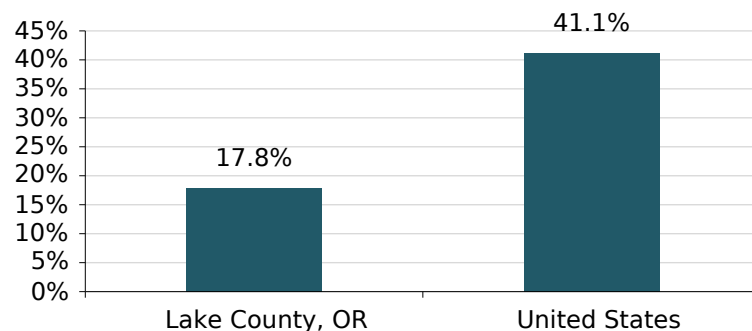
Medium Reliability: Data with CVs between 12 & 40% are in orange to indicate that the values should be interpreted with caution.

Low Reliability: Data with CVs > 40% are displayed in red to indicate that the estimate is considered very unreliable.

* Reliability estimates not yet available.

People of Color and Hispanic, Percent of Total, 2022*

- United States has the largest share of people of color (41.1%).



* ACS 5-year estimates used. The 2022 estimate is based on data collected between 2018 and 2022.

Data sources: U.S. Department of Commerce. 2023. Census Bureau, American Community Survey Office, Washington, D.C.

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Wildfire Risk

Lake County, OR

Race & Ethnicity

What do we measure on this page?

This section reports the size of populations by racial and ethnic groups as reported by the U.S. Census Bureau's American Community Survey (ACS) five-year estimates. The U.S. Census Bureau defines race and ethnicity independently:

Race: Respondents can self-identify as "White," "Black or African American," "American Indian and Alaska Native," "Asian," and "Native Hawaiian or Other Pacific Islander."

Some Other Race: This includes all other responses not included above. Respondents providing write-in entries—such as multiracial, mixed, interracial, or a Hispanic/Latino group (for example, Mexican, Puerto Rican, or Cuban)—in the "Some other race" write-in space are included in this category.

Two or More Races: This includes people who either checked two or more race response check boxes, provided multiple write-in responses, or submitted some combination of check boxes and write-in responses.

Ethnicity: Respondents identify themselves as either Hispanic or Latino, or Not Hispanic or Latino. The terms Hispanic and Latino are generally used to denote people living in the United States with cultural ties to Latin America or other Spanish speaking countries. Individuals self-identifying as having a Hispanic, Latino, or Spanish heritage can do so by selecting from categories listed on the Census questionnaire: "Mexican, Mexican American, or Chicano," "Puerto Rican," "Cuban," or "other Spanish, Hispanic, or Latino." People who identify as being of Spanish, Hispanic, or Latino culture can be of any race or combination of races.

People of Color and Hispanic: This is defined as a person whose race is not White or a person who is Hispanic or Latino (or both). Thus the "Total People of Color & Hispanic Population" is calculated by subtracting those who identify as both "Not Hispanic or Latino" and "White alone" from "Total Population."

Why is this important?

Race and ethnicity are strongly correlated with disparities in health¹⁶ and vulnerability to natural hazards and with access to aid and resources, including wildfires.¹⁷ Black, Native American, Hispanic, and other people of color may be more vulnerable to disasters due in part to cultural and institutional barriers.¹⁸ Race and wealth are linked with health conditions like asthma that can be exacerbated by wildfire smoke and environmental stress, and with access to aid and resources after a wildfire event.¹⁹ People living on Indian reservations in remote, rural areas that have higher wildfire hazard potential combined with higher rates of poverty, disabilities, and mobile home housing are particularly vulnerable to wildfire disasters.

While these data help identify the racial and ethnic makeup of a population, further outreach and analysis is required to understand values, beliefs, and attitudes of groups, and determine potential impacts of management decisions on local populations.

Wildfire Risk

Lake County, OR

Potentially Vulnerable Populations

Populations, 2022*	Lake County, OR	United States
Families in poverty	197	7,151,167
Households with no car	260	10,474,870
Mobile Homes	569	6,526,688
People under 5	410	19,004,925
People over 65	2,080	54,737,648
People with disabilities	1,453	41,941,456
People with language barriers	202	12,781,871

Percent of Total**

Families in poverty	10.2%	8.8%
Households with no car	7.7%	8.3%
Mobile Homes	16.9%	5.2%
People under 5	5.0%	5.7%
People over 65	25.4%	16.5%
People with disabilities	18.9%	12.9%
People with language barriers	2.6%	4.1%

High Reliability: Data with coefficients of variation (CVs) < 12% are in black to indicate that the sampling error is relatively small.

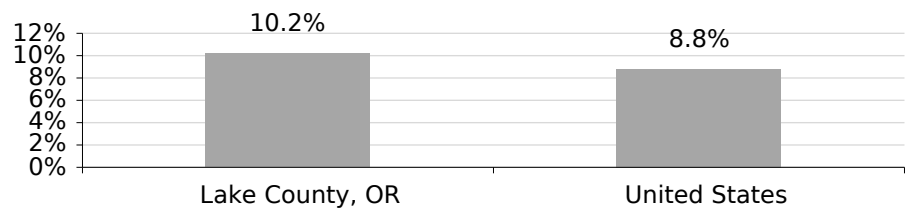
Medium Reliability: Data with CVs between 12 & 40% are in orange to indicate that the values should be interpreted with caution.

Low Reliability: Data with CVs > 40% are displayed in red to indicate that the estimate is considered very unreliable.

** Each measure on this page comes from a different subset of the overall population. For example, “poverty status” is not determined for all families. “Households with no car” is determined only for occupied households. “People with disabilities” includes only those people in civilian, noninstitutionalized settings. “Language barriers” is determined only for people five years or older.

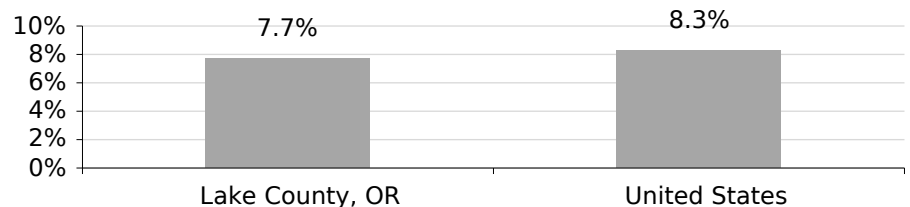
Families in Poverty, 2022*

- From 2010* to 2022*, Lake County, OR had the largest share of families in poverty (10%).



Households with No Car, 2022*

- From 2010* to 2022*, United States had the largest share of households with no car (8%).



* ACS 5-year estimates used. 2022 represents average characteristics from 2018-2022; 2010 represents 2006-2010.

Data sources: U.S. Department of Commerce. 2023. Census Bureau, American Community Survey Office, Washington, D.C.

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Wildfire Risk

Lake County, OR

Potentially Vulnerable Populations

What do we measure on this page?

This page describes household types that are associated with increased hardship. Data in this report come from the U.S. Census Bureau's American Community Survey (ACS).⁷ For more information about ACS, see the Data Sources & Methods section.

Why is it important?

People's susceptibility to wildfire is based on their ability to prepare for, respond to, and recover from a wildfire.⁸ Vulnerable populations are more likely to be disproportionately affected by wildfire disasters because they lack resources, experience cultural and institutional barriers, have limited mobility, and/or have compromised physical health.

Low income is one of the strongest predictors for compromised health and ability to recover from disruptions.⁹ 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. People with low incomes are also more likely to be overlooked during emergency response following disasters¹⁰ and are less likely to have adequate property insurance, so they bear a greater burden from property damage following wildfires.¹¹ Due to a lack of financial resources and time, families experiencing poverty may be less likely to take proactive measures to mitigate wildfire hazard in advance of an event.¹⁰

Older populations are more likely to have pre-existing medical conditions or compromised mobility, which can reduce their ability to respond to wildfire. Older adults are more susceptible to air pollution and particulates associated with wildfire smoke.¹²

Children's developing bodies make them particularly sensitive to health problems and environmental stresses.⁹ Children have faster breathing rates, putting them at greater risk to respiratory problems from wildfire smoke. Because children don't have fully developed immune systems, they are more sensitive than adults to infectious diseases that can occur when water supplies are breached and sanitation systems are compromised after a disaster.¹²

During emergencies, people who do not have a car are less likely to evacuate or have access to emergency response centers.¹³ Access to a car is also linked with higher wages and more financial stability.¹⁴

Populations with disabilities are subject to health complications that make wildfire more consequential because disasters often result in limited access to medical care.¹² Compromised mobility and medical conditions¹² can reduce their ability to respond to natural disasters.

Language and cultural barriers can make it more difficult to follow directions or interact with agencies before, during, or after a wildfire disaster.¹³

Mobile and manufactured homes house an estimated 2.7 million U.S. households and create both physical and economic risk. Mobile and manufactured homes are more likely to be damaged during disasters. Fires spread faster in mobile and manufactured homes, threatening both the structure and the occupants. Most mobile and manufactured homeowners do not own the land where their residence sits, giving them less agency to mitigate threats to their property such as creating defensible space. Research has found mobile and manufactured homeowners experience barriers to accessing aid after disasters.¹⁵

Wildfire Risk

Lake County, OR

Housing Characteristics

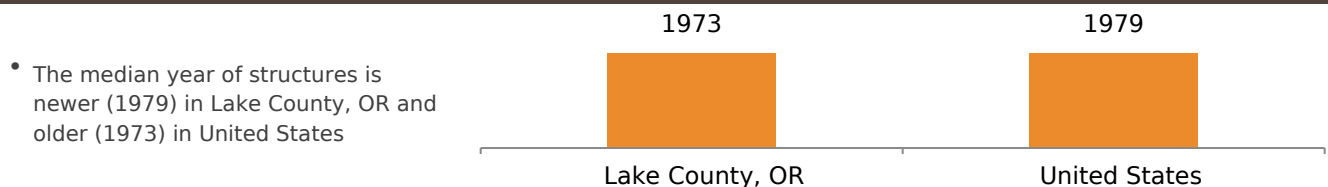
	Lake County, OR	United States
Total Housing Units, 2022*	4,226	140,943,613
Occupied	3,364	125,736,353
Vacant	862	15,207,260
For rent	33	2,623,236
Rented, not occupied	51	537,152
For sale only	17	931,393
Sold, not occupied	45	618,155
Seasonal, recreational, occasional	537	4,959,188
For migrant workers	0	32,888
Other vacant	179	5,505,248
Year Built		
Built 2010 or later	99	12,375,020
Built 2000 to 2009	449	19,083,462
Built 1990 to 1999	525	18,596,006
Built 1980 to 1989	636	18,543,631
Built 1970 to 1979	608	20,613,893
Built 1940 to 1969	1,385	34,755,089
Median year structure built^	1973	1979

Percent of Total

Occupancy		
Occupied	79.6%	89.2%
Vacant	20.4%	10.8%
For rent	0.8%	1.9%
Rented, not occupied	1.2%	0.4%
For sale only	0.4%	0.7%
Sold, not occupied	1.1%	0.4%
Seasonal, recreational, occasional	12.7%	3.5%
For migrant workers	0.0%	0.0%
Other vacant	4.2%	3.9%
Year Built		
Built 2010 or later	2.3%	8.8%
Built 2000 to 2009	10.6%	13.5%
Built 1990 to 1999	12.4%	13.2%
Built 1980 to 1989	15.0%	13.2%
Built 1970 to 1979	14.4%	14.6%
Built 1940 to 1969	32.8%	24.7%

High Reliability: Data with coefficients of variation (CVs) < 12% are in black to indicate that the sampling error is relatively small.
Medium Reliability: Data with CVs between 12 & 40% are in orange to indicate that the values should be interpreted with caution.
Low Reliability: Data with CVs > 40% are displayed in red to indicate that the estimate is considered very unreliable.

Median year structure built, 2022*



- The median year of structures is newer (1979) in Lake County, OR and older (1973) in United States

* ACS 5-year estimates used. 2022 represents average characteristics from 2018-2022.

Data Sources: U.S. Department of Commerce. 2023. Census Bureau, American Community Survey Office, Washington, D.C.

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Wildfire Risk

Lake County, OR

Housing Characteristics

What do we measure on this page?

This page describes whether housing is occupied or vacant, for rent or seasonally occupied, and the year built.

Rent: The number of homes for rent was defined as occupied housing units that were for rent, vacant housing units that were for rent, and vacant units rented but not occupied at the time of interview.

Seasonal, Recreational, or Occasional Use: Refers to vacant units used or intended for use only in certain seasons or for weekends or other occasional use throughout the year.

For Migrant Workers: Refers to housing units intended for occupancy by migratory workers employed in farm work during the crop season.

Why is it important?

Efforts to reduce wildfire risk to homes center around the home ignition zone, an area 100-200 feet from the foundation. It includes vegetation, the home itself, and other structures or attachments like decks, furniture, fences, and outbuildings.

A majority of homes lost to wildfire are first ignited by embers. By reducing the susceptibility of the area immediately around the home and the home itself—the home ignition zone—the chances of a home surviving an ember storm or small spot-fire are greatly increased.

Housing characteristics are relevant to reducing the risk from wildfires in several ways. The year the home was built may convey information about the housing stock that was built before and after the passage of land use planning regulations to reduce exposure to homes (for example, a building code requiring the use of wildfire-resistant building materials). It may also be possible that newer homes incorporate improved building standards and materials that reduce susceptibility to wildfires.

The prevalence of rental properties, seasonal homes and recreational homes, vacant homes, and homes used for migrant workers may complicate landowner education efforts that are aimed at reducing risk in the home ignition zone. 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.

CHANGES IN BOUNDARIES: Data describing change over time can be misleading when geographic boundaries have changed. The Census provides documentation about changes in boundaries at this site: www.census.gov/geo/reference/boundary-changes.html

Wildfire Risk

Lake County, OR

Land Ownership

	Lake County, OR	United States
Total Acres*	5,321,609	2,255,912,699
Private Lands	1,317,652	1,339,427,106
Conservation Easement	40,769	31,813,835
Federal Lands	3,893,909	622,042,308
Forest Service	1,025,851	192,007,324
BLM	2,584,998	241,746,365
National Park Service	0	76,520,318
USFWS	283,060	84,456,688
Military	0	20,174,195
Other Federal	0	7,137,418
State Lands	110,046	181,586,342
State Trust Lands*	0	47,981,215
Other State	110,046	133,605,127
Tribal Lands	0	101,033,432
City, County, Other	2	11,823,511

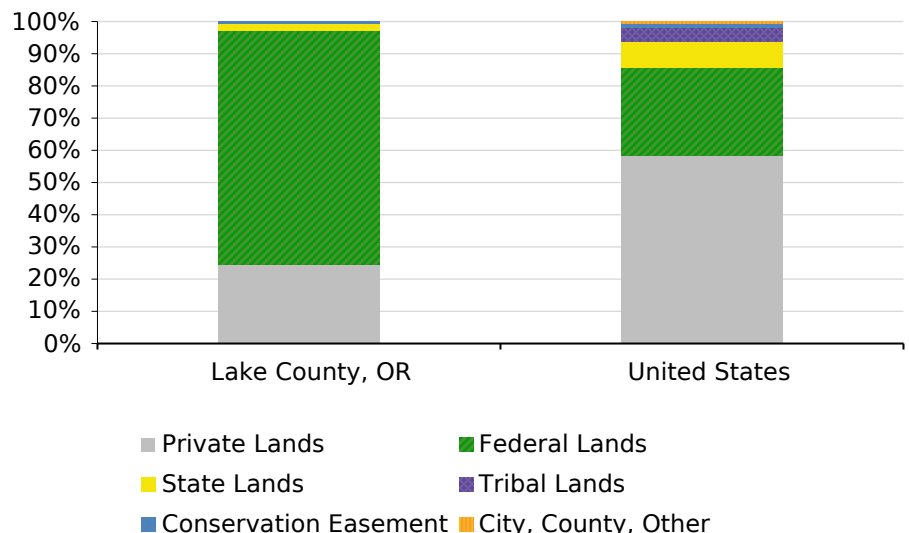
Percent of Total

Private Lands	24.8%	59.4%
Conservation Easement	0.8%	1.4%
Federal Lands	73.2%	27.6%
Forest Service	19.3%	8.5%
BLM	48.6%	10.7%
National Park Service	0.0%	3.4%
USFWS	5.3%	3.7%
Military	0.0%	0.9%
Other Federal	0.0%	0.3%
State Lands	2.1%	8.0%
State Trust Lands*	0.0%	2.1%
Other State	2.1%	5.9%
Tribal Lands	0.0%	4.5%
City, County, Other	0.0%	0.5%

Land Ownership, Percent of Land Area

*Does not include most water.

- Lake County, OR has the largest share of federal public lands (73.2%), and United States has the smallest (27.6%).
- United States has the largest share of state public lands (8%), and Lake County, OR has the smallest (2.1%).
- United States has the largest share of private lands (59.4%), and Lake County, OR has the smallest (24.8%).



Data Sources: U.S. Geological Survey, Gap Analysis Program. 2022. Protected Areas Database of the United States (PADUS) version 3.0

Wildfire Risk

Lake County, OR

Land Ownership

What do we measure on this page?

This page describes the share of the selected location that is private and the share that is managed by various public agencies.

The data presented in this report were calculated using Geographic Information System (GIS) tools. Two primary GIS datasets were used: U.S. Census Bureau's TIGER/Line County Boundaries²⁰ and U.S. Geological Survey's Protected Areas Database (PADUS).^{21, 22}

Although every attempt was made to use the best available GIS land ownership dataset, the data sometimes have errors or become outdated. Please report any inaccuracies to eps@headwaterseconomics.org.

Why is it important?

Wildfires can occur on any lands—including private, state, tribal and federal lands—and fires also can spread across multiple land ownerships. Because of this, wildland firefighting is by necessity most often a multi-agency effort. Efforts to reduce the likelihood (probability) of a fire and the intensity of a fire (related to fuels and topography) can have important consequences on homeowner and firefighter safety and on the vulnerability of the built environment, especially homes.

Wildfires do not respect property boundaries and burn across a mosaic of land ownerships. Efforts to reduce the likelihood and intensity of wildfires can have important implications for neighboring lands and properties. For example, fuel treatments on U.S. Forest Service lands can lower the intensity of a wildfire and therefore reduce the risk to homes on nearby private lands.²³ At the same time, communities can reduce the susceptibility of homes to wildfire through land use planning and by focusing mitigation efforts on the “home ignition zone” to reduce a home’s vulnerability to embers.²⁴ Fire-adapted communities can live with the inevitability of wildfires. By being fire-adapted, communities make it more likely that managers of nearby lands—whether state, federal, or tribal—can use fires for their ecological role, allowing some to burn or setting controlled burns to reduce fuels.

Wildfire Risk

Lake County, OR

Data Sources & Methods

This report uses statistics from public government sources and from the Wildfire Risk to Communities website. All data used can be verified with the original sources:

Wildfire Risk to communities. 2024.

USDA Forest Service, Wildfire Risk to Communities. 2024. Washington, D.C., wildfirerisk.org.

U.S. Geological Survey, Gap Analysis Program. 2012.

Protected Areas Database of the United States (PADUS) version 1.3

<https://www.usgs.gov/core-science-systems/science-analytics-and-synthesis/gap/science/protected-areas>

U.S. Department of Commerce. 2022

Census Bureau, American Community Survey Office, Washington, D.C.

<https://www.census.gov/programs-surveys/acs>

Wildfire Risk

Lake County, OR

Endnotes

- 1 - See *Wildfire Risk to Communities* website: <https://wildfirerisk.org/understand-risk/>. Also see Scott JH, Gilbertson-Day JW, Moran C, Dillon GK, Short KC, and Vogler KC. 2020. *Wildfire Risk to Communities: Spatial datasets of landscape-wide wildfire risk components for the United States*. Fort Collins, CO: Forest Service Research Data Archive. <https://doi.org/10.2737/RDS-2020-0016>.
- 2 - A useful resource on rural population change is the U.S. Department of Agriculture's Economic Research Service web page: <https://www.ers.usda.gov/topics/rural-economy-population/population-migration/>.
- 3 - William H. Frey's website provides links to publications, issues, media stories, data tools and resources on migration, population redistribution, and demography of both rural and urban populations in the U.S.: <http://frey-demographer.org/>.
- 4 - For a description of the U.S. Census Bureau's ACS methodology and data accuracy, see <https://www.census.gov/programs-surveys/acs/methodology.html>.
- 5 - Martinuzzi S, Stewart SI, Helmers DP, Mockrin MH, Hammer RB, and Radeloff VC. 2015. *The 2010 wildland-urban interface of the conterminous United States*. Research Map NRS-8. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 124p. <https://www.nrs.fs.fed.us/pubs/48642>. Also Radeloff VC, et al. 2017. Rapid growth of the U.S. wildland-urban interface raises wildfire risk. *PNAS* 115(13): 3314-3319. www.pnas.org/cgi/doi/10.1073/pnas.1718850115. Mietkiewicz N, Balch J, Schoennagel T, Leyk S, Denis L, and Bradley B. 2020. In the line of fire: Consequences of human-ignited wildfires to homes in the U.S. (1992-2015). *Fire*. Available online: <https://www.mdpi.com/2571-6255/3/3/50>.
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- 7 - <https://www.census.gov/programs-surveys/acs>
- 8 - Collins TW and Bolin B. 2008. Situating hazard vulnerability: People's negotiations with wildfire environments in the U.S. Southwest. *Environmental Management* 44: 441-455.
- 9 - County of Los Angeles Public Health. 2013. Health Atlas for the City of Los Angeles. Los Angeles, CA. <https://wattscommunitystudio.files.wordpress.com/2013/06/healthatlas.pdf>
- 10 - Fothergill A and Peek LA. 2004. Poverty and disasters in the United States: A review of recent sociological findings. *Natural Hazards* 32(1): 89-110.

Endnotes

- 11 - Wilkinson RG and Marmot MG. 2003. *Social determinants of health: The solid facts*. World Health Organization. http://www.euro.who.int/_data/assets/pdf_file/0005/98438/e81384.pdf.
- 12 - Balbus JM and Malina C. 2009. Identifying vulnerable subpopulations for climate change health effects in the United States. *Journal of Occupational and Environmental Medicine* 51(1): 33-37.
- 13 - Cooley H, Moore E, Heberger M, and Allen L. 2012. *Social Vulnerability to Climate Change in California*. California Energy Commission Pub. # CEC-500-2012-013.
- 14 - Raphael S and Rice L. 2002. Car ownership, employment, and earnings. *Journal of Urban Economics* 52(1): 109-130.
- 15 - Rumbach A, Sullivan E, Makarewicz C. 2019. Mobile Home Parks and Disasters: Understanding Risk to the Third Housing Type in the United States, see <https://ascelibrary.org/doi/10.1061/%28ASCE%29NH.1527-6996.0000357>
- 16 - Carratala S, Maxwell C. 2020. Health disparities by race and ethnicity. Center for American Progress, see <https://www.americanprogress.org/article/health-disparities-race-ethnicity/>
- 17 - Davies I, Haugo RD, Robertson JC, Levin PS. 2018. The unequal vulnerability of communities of color to wildfire. *PLOS ONE* 13(11): e0205825, see <https://doi.org/10.1371/journal.pone.0205825>
- 18 - Fothergill A, Maestas EGM, Derouen Darlington J. 1999. Race, Ethnicity, and Disasters in the United States: A review of the literature. *Disasters* 23: 156-173, see <https://doi.org/10.1111/1467-7717.00111>
- 19 - Anderson S, Plantinga AJ, Wibbenmeyer M. 2020. Inequality in agency responsiveness: Evidence from salient wildfire events. *Resources for the Future*, see <https://www.rff.org/publications/working-papers/inequality-agency-responsiveness-evidence-salient-wildfire-events/>
- 20 - U.S. Census Bureau TIGER/Line Boundaries are available at <https://www.census.gov/geographies/mapping-files/time-series/geo/tiger-line-file.html>.
- 21 - The U.S. Geological Survey Protected Areas Database (PADUS) is available at <https://gapanalysis.usgs.gov/padus/>.
- 22 - If accurate measurements of water surface area are needed, the U.S. Geological Survey's national hydrography dataset can be used: <https://nhd.usgs.gov/>.
- 23 - <https://wildfirerisk.org/understand-risk/>
- 24 - <https://wildfirerisk.org/reduce-risk/home-ignition-zone/>



Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)



Generated: July 6, 2024

Weather and vegetation conditions vary daily and seasonally. For current conditions and local fire restrictions, contact your local fire district or visit: www.keeporegongreen.org/current-conditions

INTRODUCTION

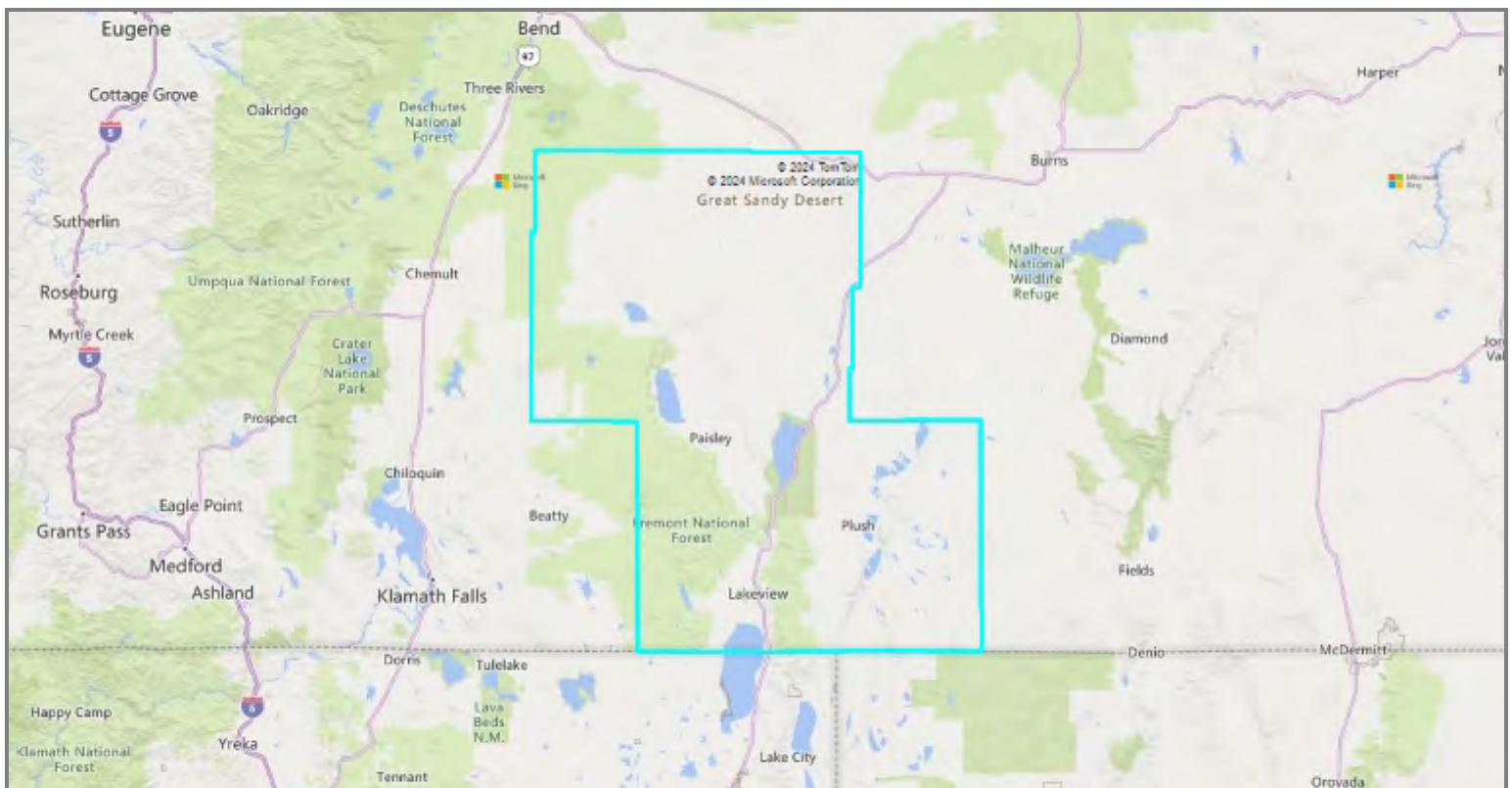
This report summarizes wildfire risk in Lake County from the [Advanced Oregon Wildfire Risk Explorer map viewer](#) (OWRE). Wildfire risk combines the likelihood of a fire occurring with the exposure and susceptibility of valued resources and assets on the landscape.

Nearly all areas in Oregon experience some level of wildfire risk. Conditions vary widely with local topography, fuels, and local weather, especially local winds. In all areas, under warm, dry, windy, and drought conditions, expect higher likelihood of fire starts, higher fire intensities, more ember activity, a wildfire more difficult to control, and more severe impacts.

Lake County in Oregon



Lake County Reference Map



REPORT CONTENTS

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Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)



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GUIDELINES

The OWRE Advanced Report provides wildfire risk information for a customized area of interest to support Community Wildfire Protection Plans (CWPPs), Natural Hazard Mitigation Plans (NHMPs), and fuels reduction and restoration treatments in wildfire-prone areas in Oregon. Here are some things you need to know about this information:

The Advanced OWRE map viewer provides **wildfire risk assessment** data primarily from the 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, produced by the US Forest Service with a coalition of local fire managers, planners, and natural resource specialists in both Washington and Oregon. The assessment uses the most current data (incorporating 2017 fires) and state-of-the-art fire modeling techniques, and is the most up-to-date wildfire risk assessment for Oregon. The assessment characterizes risk of large wildfires (>250 acres). Data also comes from the 2013 West Wide Wildfire Risk Assessment, Oregon Department of Forestry (ODF), and other sources.

Wildfire risk is modeled at a landscape scale. The data does not show access for emergency response, home construction materials, characteristics of home ignition zones, or NFPA Firewise USA® principles. For CWPP and NHMP updates you may want to **consider two scales**:



- first, use data from the OWRE to characterize and understand the fire environment and fire history in your area broadly at a landscape scale, focusing on watersheds or counties;
- then, overlay local knowledge, focusing on communities, fire protection capabilities, local planning areas, and defensible space concepts for neighborhoods and homes.

The OWRE Advanced Report will provide the landscape context of the current fire environment and fire history upon which you can build your local plans toward resilience by preparing and mitigating the larger landscape wildfire risk.

The OWRE Advanced Map Viewer and Report will not replace local knowledge of communities you may consider high risk. Continue to use local Fire Department and ODF knowledge to generate CWPP concern areas. OWRE will produce broad scale maps for your CWPP area as a whole, but maps and data will contain some inaccuracies, which are most prevalent at fine scales.

Recommended additional information sources for wildfire planning:

- Oregon Department of Forestry CWPP list - <https://www.oregon.gov/ODF/Fire/Pages/CWPP.aspx>
- Oregon Explorer Communities Reporter - demographic and other data for counties and communities <https://oe.oregonexplorer.info/rural/CommunitiesReporter/>
- Wildland Urban Interface Toolkit - https://www.usfa.fema.gov/wui_toolkit/wui_planning.html
- Wildland Urban Interface Wildfire Mitigation Desk Reference Guide - <https://www.nwcg.gov/sites/default/files/publications/pms051.pdf>
- Oregon Spatial Data Library - <https://spatialdata.oregonexplorer.info/geoportal/>
- NFPA Firewise USA® - teaching people how to adapt to living with wildfire and encouraging neighbors to work together and take action to prevent losses. - <https://www.nfpa.org/Public-Education/By-topic/Wildfire/Firewise-USA>
- Headwaters Economics - Full Community Costs of Wildfire - <https://headwaterseconomics.org/wildfire/homes-risk/full-community-costs-of-wildfire/>

This Advanced Wildfire Risk Report was generated from the Advanced Oregon Wildfire Risk Explorer map viewer at: tools.oregonexplorer.info/OE_HtmlViewer/index.html?viewer=wildfireplanning. This site is intended for wildfire professionals and planners. For a basic summary of wildfire risk geared toward a public audience, visit the basic OWRE map viewer: tools.oregonexplorer.info/OE_HtmlViewer/index.html?viewer=wildfire.



Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)



Generated: July 6, 2024

WILDFIRE RISK ASSESSMENT CONCEPTS & DATA

The Advanced Oregon Wildfire Risk Explorer (OWRE) map viewer organizes data into folders based on wildfire risk concepts. All OWRE advanced reports will include information about Overall wildfire risk, Burn probability, Flame length, Overall potential impact, Hazard to potential structures, Fire history, Land management, and Estimated housing density. Users can select additional data layers of interest, which will appear after the layers listed above.

Wildfire Risk

Overall wildfire risk takes into account both the likelihood of a wildfire and the exposure and susceptibility of mapped valued resources and assets combined. The dataset considers (1) the likelihood of wildfire >250 acres (likelihood of burning), (2) the susceptibility of resources and assets to wildfire of different intensities, and (3) the likelihood of those intensities. Blank areas either have no currently mapped assets or resources and/or are considered a non-burnable fuel in terms of wildfire. Note that agricultural lands are considered non-burnable in this map, even though fires can occur in these areas and may spread into more typically considered burnable areas such as forested lands. Data layers include: Overall wildfire risk, Wildfire risk to assets, and Wildfire risk to people and property.

Wildfire Threat

Wildfire threat shows the likelihood of a large wildfire, the average intensity and the likelihood of higher intensities, conveyed by flame length. Data layers include: Burn probability, Average flame length, Probability of exceeding 4' flames, and Probability of exceeding 8' flames. Additional data layers that show wildfire threat are found under the Fire History and Active Fires folder, where historical fire starts and historical fire perimeters are located.



Wildfire Potential Impacts

Wildfire potential impacts shows the actual exposure of mapped resources and assets. The data layers do not incorporate the likelihood of burning, they only show the consequence of wildfire if it were to occur. Data layers include: Overall potential impact, Potential impact to people and property, Potential impact to infrastructure, Potential impact to timber resources, Potential impact to wildlife, and Potential impact to forest vegetation. The layers (Potential impact to timber resources, wildlife, and forest vegetation) may be useful when targeting fuels treatment. These layers are influencing the "Benefit" areas in the Overall wildfire risk map - they show areas where there is ecological opportunity to restore historical or desired conditions and/or potentially reduce the risk of catastrophic wildfire with managed fire use or other management. The Potential impact to forest vegetation optional report element is coupled with historical fire regime information to give basic context when comparing historical and current conditions.

Hazard to Potential Structures

Hazard to potential structures depicts the hazard to hypothetical structures in any area if a wildfire were to occur. This differs from Potential Impacts, as those estimates consider only where people and property currently exist. In contrast, this layer maps hazard to hypothetical structures across all directly exposed (burnable), and indirectly exposed (within 150 meters of burnable fuel) areas in Oregon. As with the Potential Impacts layers, the data layer does not take into account wildfire probability, it only shows exposure and susceptibility.

Fire Model Inputs and Fuelscape

These layers are the fuels and topography used to run the fire model in the 2018 Pacific Northwest Quantitative Wildfire Risk Assessment. Data layers include: Fuel models, Fuel model groups, Forest canopy base height, Forest canopy height, Forest canopy cover, Forest canopy bulk density, Slope, Elevation and Aspect. Fuel models and groups characterize local surface vegetation composition relative to carrying fire more precisely than a basic land cover or vegetation maps. Fuel models indicate the type of potential wildfire based on the fuels that will ignite and spread fire. Canopy data layers characterize vegetation structure for fire modeling: base height, cover, and bulk density estimates can show where there may be propensity for ladder fuels (ground vegetation and trees that reach up to tree branches and upper forest canopy), and where contiguous forest canopies have potential for canopy fire. Note that not all of these layers are available to select for use in the OWRE advanced reports, but all of them are available for download and they are described in the metadata. Also note that weather, the third part of the three major elements that determine wildfire occurrence and intensity, is not included in this data distribution - please see the full report to understand the weather parameters used in the assessment.

For more detailed information, please see the full 2018 PNW Quantitative Wildfire Risk Assessment report:

oe.oregonexplorer.info/externalcontent/wildfire/reports/20170428_PNW_Quantitative_Wildfire_Risk_Assessment_Report.pdf



Oregon Wildfire Risk Explorer- Advanced Report

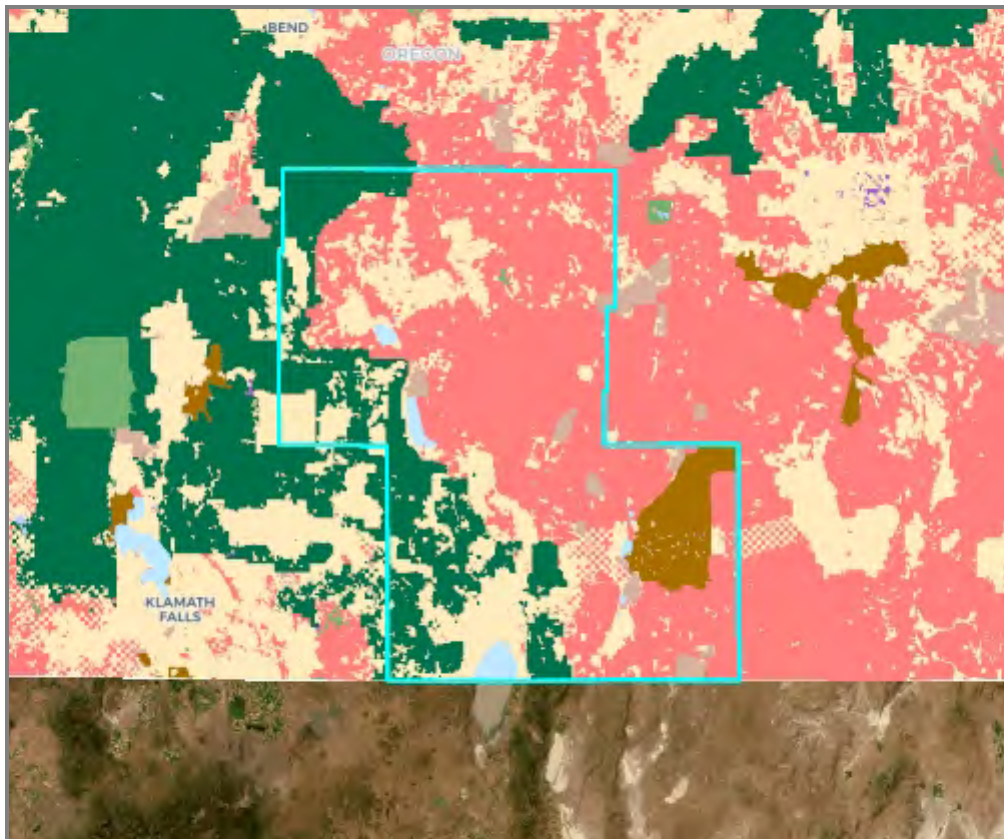
Lake County

5,350,506 Acres: (8,360 Sq. Miles)



Generated: July 6, 2024

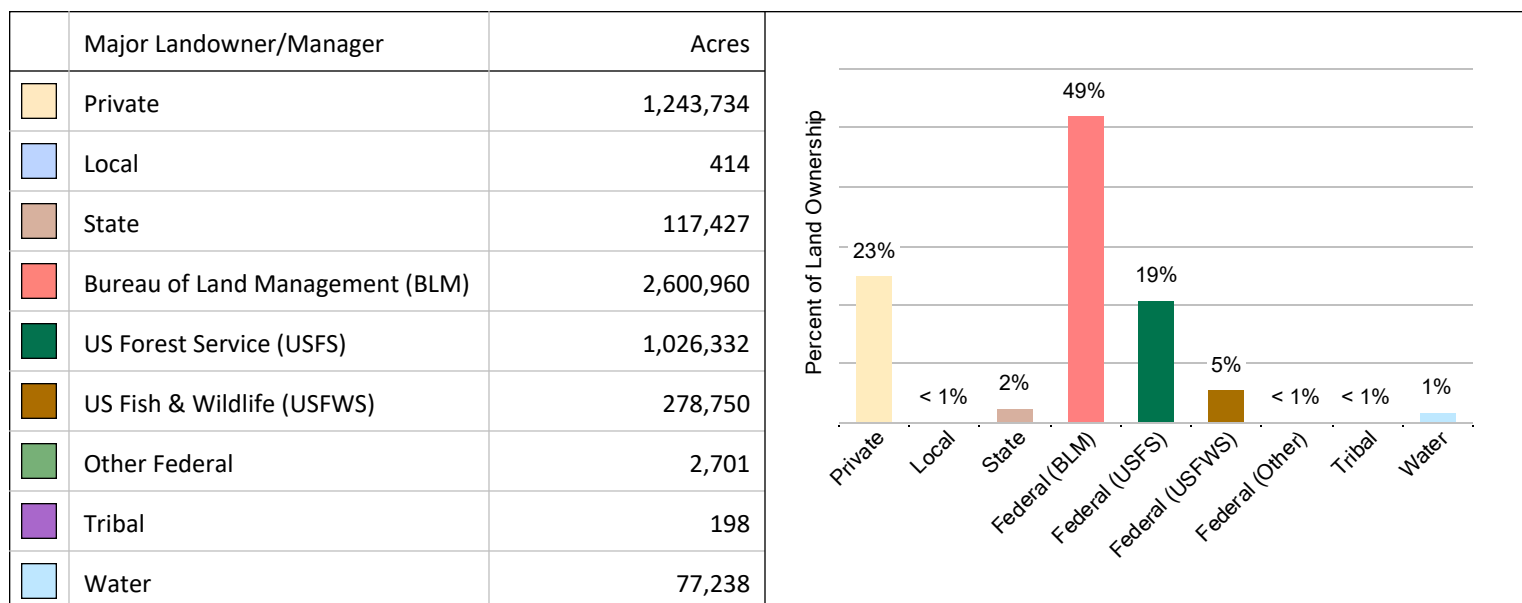
LAND OWNERSHIP AND MANAGEMENT



Knowing the land ownership and management in an area is important for hazard planning and awareness when wildfires occur. Oregon has a complete and coordinated wildfire management system between local, private, tribal, state, and federal agencies. These entities participate to fight fire in local areas and throughout the state according to their jurisdictions and protection responsibilities. Different land owners and managers have a variety of highly valued resources and assets to protect. Agencies differ in land use and overall management, including fire management.

The map, table and charts below show the breakdown of ownership types in your area.

Lake County



Source: Bureau of Land Management, 2015

* Values may add up to over 100% due to rounding precision



Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)



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OREGON WUI COMMUNITY HAZARD RATINGS

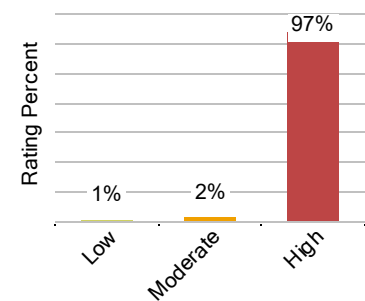
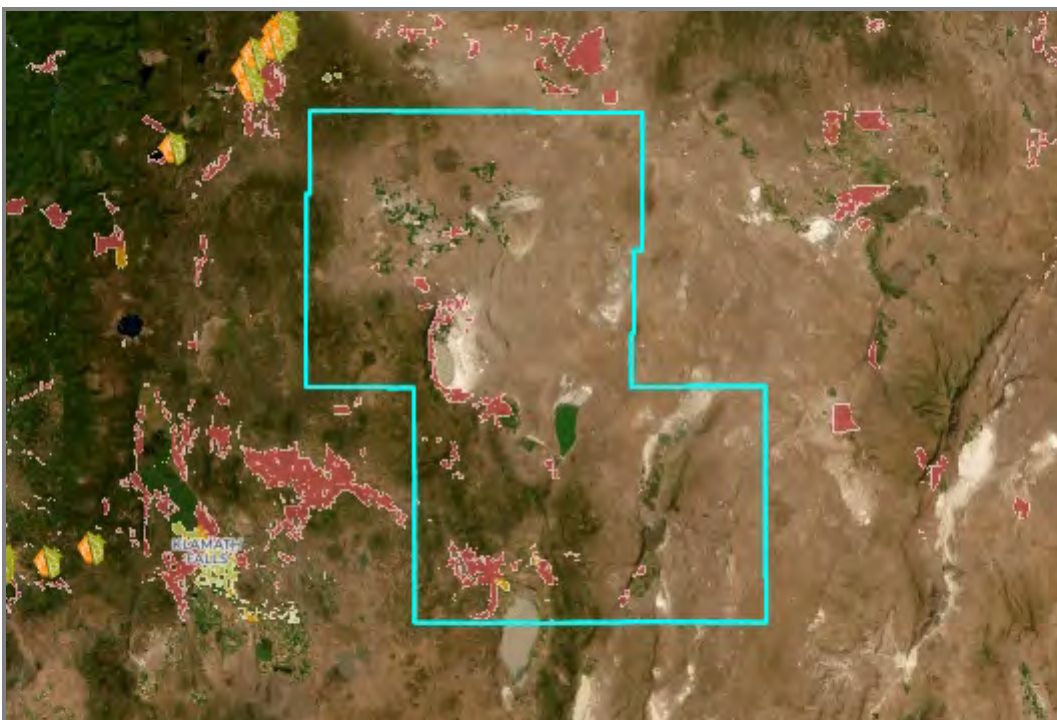
Counting locally identified communities and neighborhoods, there are up to 6.9 million acres of Wildland Urban Interface (WUI) areas in Oregon. These areas were identified using a base WUI dataset from Radeloff, V.C., et. al, 2017 (published by USFS RDA), which incorporated 2010 census and 2011 land cover data. Locally mapped communities from Community Wildfire Protection Plans (CWPPs) from 2008 through 2013 were associated with the WUI geography. Department of Land Conservation & Development 2017 Oregon Land Use Zoning was also included for recent residential and developed or developing rural growth since the 2010 census. A cross-check was also made with the “100 Communities at Risk” report from the QWRA. Note that this WUI acreage contrasts with the 2.4 million acres from the West Wide Risk Assessment (Where People Live/Wildland Development Areas). The source Radeloff et. al WUI data used census block housing counts and land cover as opposed to WWRA Landsat night lights and housing densities. Acreage is larger in this Oregon WUI due to some rural areas having built environments along roads that spline two or more large census blocks, and we erred on the side of inclusion to add those entire areas to the dataset and not disrupt the original WUI geography. Also very small rural town centers that can potentially be encompassed by catastrophic wildfire, are kept whole in the Oregon WUI dataset.

Burn Probability from the QWRA was used to assign a wildfire hazard rating to the built environment and homes in these areas. Hazard levels are based on modeled vegetation, not on building construction materials or ingress/egress issues. For a comprehensive analysis of wildfire risk and understanding of the potential threat of wildfire to your community, view the WUI combined with local fire starts and information in your Community Wildfire Protection Plan. A Community Wildfire Protection Plan (CWPP) is the product of collaboration between local communities and agencies interested in reducing wildfire risk and addressing response in a comprehensive plan. It also allows counties to prioritize and mitigate high risk areas, enhance safety and better protect themselves and their forested landscapes from wildfire.

Even in areas where risk is high, defensible space and Firewise USA® principles can be incredibly useful in minimizing the risk to homes in the Wildland Urban Interface.

Lake County

WUI Hazard Area Acres in Lake County



	Rating	Acres
	Low	751
	Moderate	3,006
	High	127,325
	Firewise Site	



Oregon Wildfire Risk Explorer- Advanced Report

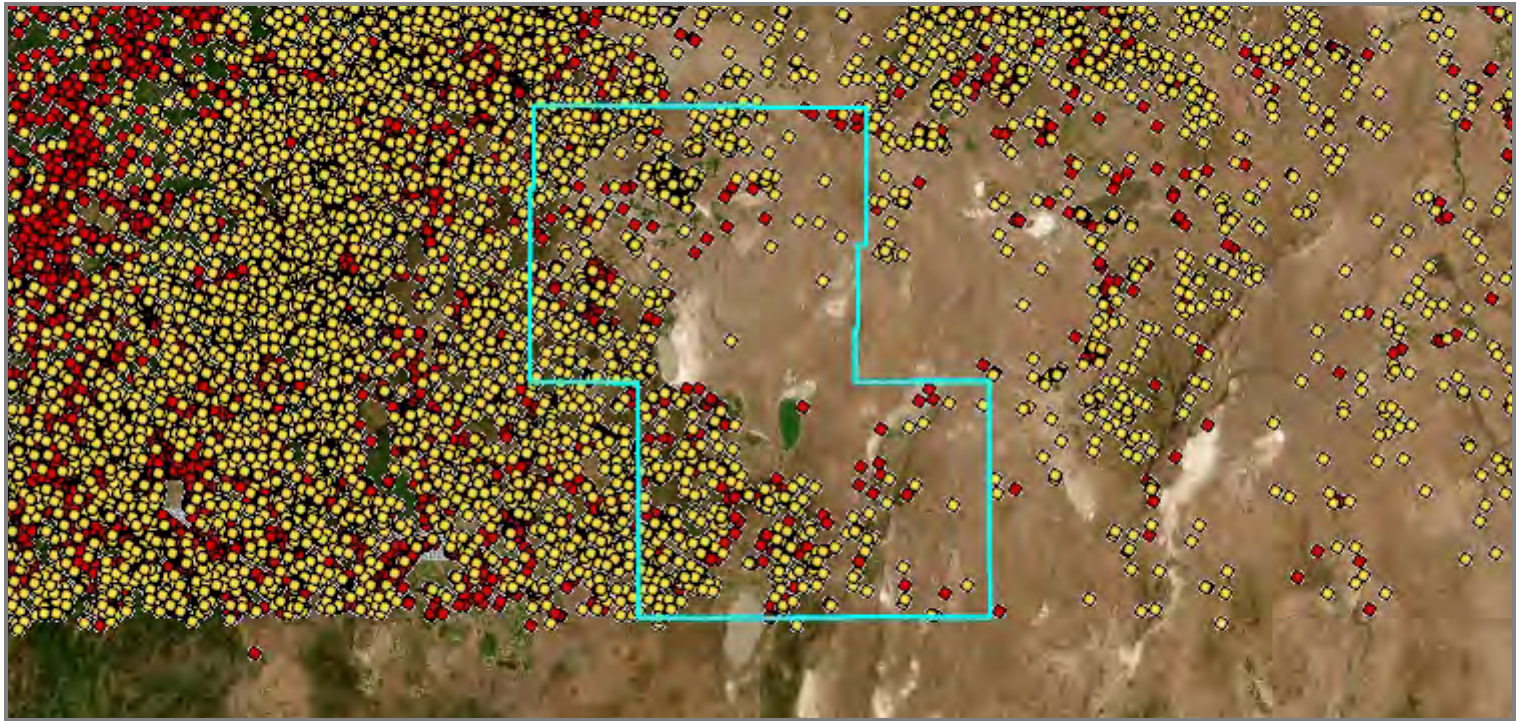
Lake County

5,350,506 Acres: (8,360 Sq. Miles)

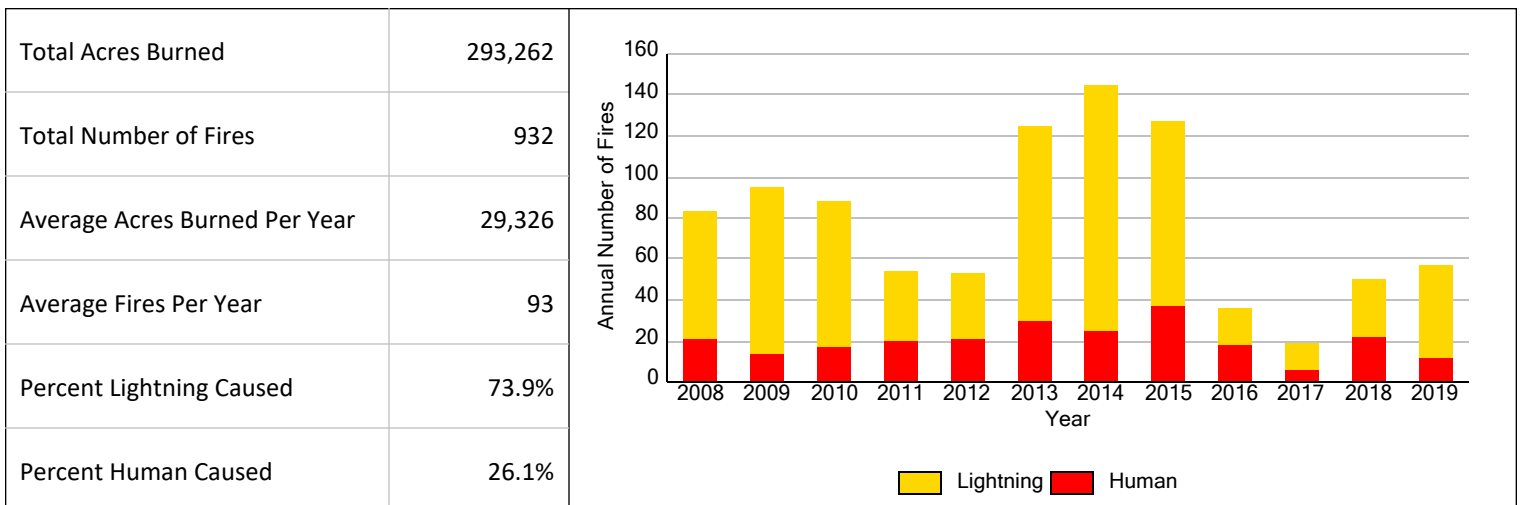


Generated: July 6, 2024

FIRE HISTORY - FIRE IGNITIONS



Lake County fire starts between 2008-2019



Knowing where and why fires start is the first step in awareness, prevention, and mitigation. Viewing local fire starts in conjunction with burn probability (provided later in this report) provides a comprehensive view of local fire history and potential.

Statewide, 71% of fires recorded by ODF are human-caused, and many of these fires are near populated areas. Lightning caused fires make up only 29% of fire starts, but tend to burn more acres as they are often located in remote areas.

The map, table and charts on this page show the cumulative number fire starts in your area.

Source: Short, K. and Oregon Department of Forestry, 2019



Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)

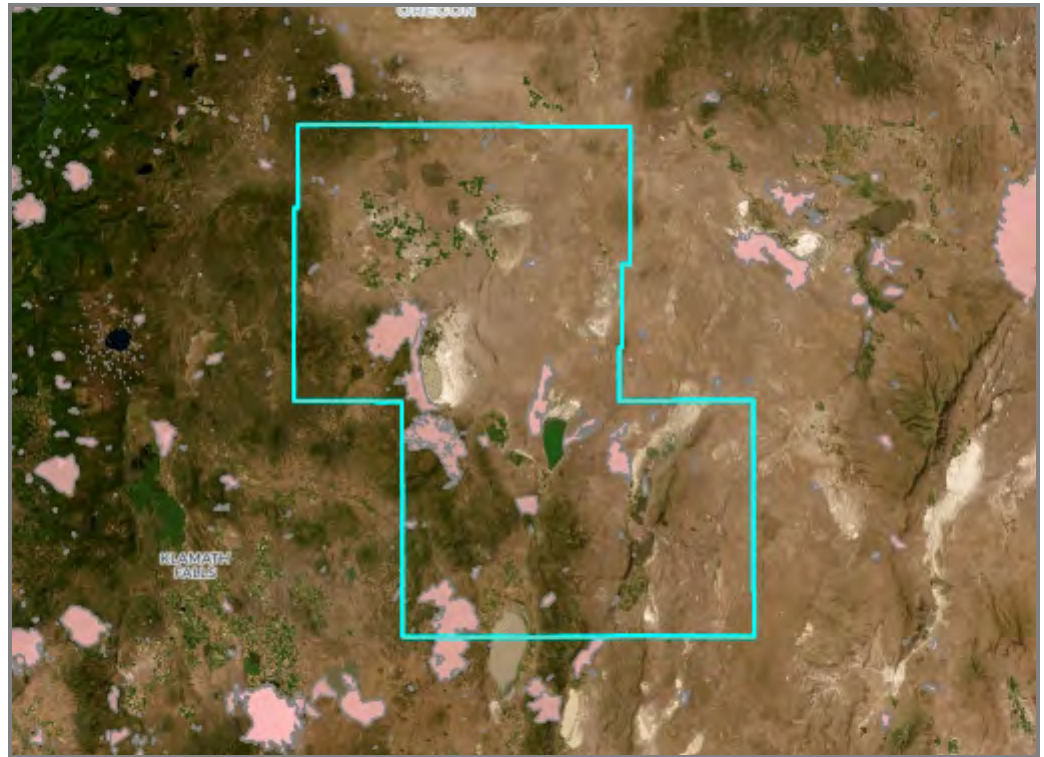


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FIRE HISTORY - FIRE PERIMETERS

Although most wildfires in Oregon are human-caused and suppressed quickly while small, Oregon has experienced many large wildfires. The map and table below show the footprints of some large wildfires that have occurred in your area.

 Perimeter



Wildfires in Lake County

Wildfire Name	Year	Acres Burned
Bootleg	2021	413,717
Cougar Peak	2021	91,701
Log	2021	16,337
Patton Meadow	2021	8,930
Warner Wetlands RX	2021	1,435
HOLE IN THE GROUND 0778 NE	2021	311
Crump	2021	53
Soda Lake	2021	12
Picture Rock	2021	5
Thousand Springs	2021	5
Shed Fire	2021	3
Fossil Fire	2021	2
Highway 31	2021	2
Pine	2021	1
Chucker	2021	1
314 summer	2021	< 1
Cougar	2021	< 1
Emery Fire	2021	< 1
Webster	2021	< 1
Ward	2021	< 1
Garden	2021	< 1
Brimwell	2021	< 1



Oregon Wildfire Risk Explorer- Advanced Report

Lake County

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Gubsher Well	2021	< 1
Johnson	2021	< 1
Gap Fire	2021	< 1
Lookout	2021	< 1
Brattain	2020	50,952
Crane	2020	2,984
Ben Young	2020	1,249
Dragon Rock	2020	858
Sage Hen	2020	17
Chukar	2020	11
Clover Flat	2020	8
Chewaucan	2020	2
Bridge Creek Fire	2020	2
Mile Post Five	2020	1
Mile Marker Ninety Seven	2020	< 1
Butte	2020	< 1
Ward Lake #376	2020	< 1
Try 2	2020	< 1
Collins	2020	< 1
East Bay Two	2020	< 1
Poker	2019	23,401
Poker	2019	23,392
Flynn	2019	163
Silver Creek	2019	109
Dairy	2019	100
Watson Creek	2018	59,065
1022 NE	2018	48
Cinder Butte	2017	52,436
Ana	2017	2,772
Jade Creek	2017	773
Wildcat	2017	694
Coglan	2017	183
Coglan	2017	183
0991 NE WATKINS	2017	98
Well	2017	72
Watkins	2017	42
Silver	2017	7
Hart Fire	2017	< 1
Withers	2016	3,401
Hilltop	2015	8
MALT	2014	1,063
Malt	2014	1,063
Malt	2014	797
Butte Valley	2014	19
RIFFLE	2013	1,008
ALGER	2013	49
Barry Point	2012	92,958



Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)



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BARRY POINT	2012	92,945
Barry Point	2012	92,941
Lava	2012	17,285
Blue Joint	2012	3,412
Hickey	2012	2,806
Crack-in-the-Ground	2012	858
Hickey	2012	411
Barry Point	2012	20
Garden	2011	5,356
ANA	2011	281
Buffalo	2011	84
Poker Jim	2010	3,004
McManus	2010	215
Hart Bar	2010	106
Well	2009	326
Sheeplick	2009	16
Horseshoe 1058	2008	844
Round Top Butte	2007	8,347
FLETCHER	2007	8,082
Sagehen	2005	567
Flook Lake	2005	384
Benjamin Lake Complex	2005	270
Benjamin Lake Complex	2005	153
Grassy	2004	4,226
Flat Top	2003	86
Marsh	2003	11
Toolbox	2002	59,923
Toolbox	2002	59,298
Winter	2002	30,518
Silver	2002	24,731
Silver	2002	23,927
Wiinter	2002	19,561
Grizzly	2002	5,834
Grizzly	2002	5,825
Tucker	2002	1,775
Lava	2002	1,516
Toolbox	2002	498
Logan	2002	135
Logan	2002	129
Grizzly	2002	77
Grizzly	2002	77
Grizzly	2002	7
Logan	2002	6
Grizzly	2002	1
Grizzly	2002	1
Grizzly	2002	1
Grizzly	2002	< 1



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5,350,506 Acres: (8,360 Sq. Miles)



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Grizzly	2002	< 1
Big Juniper	2001	80,081
Johnson	2001	1,875
Johnson	2001	1,731
South Warner	2001	1,701
South Warner	2001	1,701
Jump	2001	571
Christmas	2001	353
Lost Creek	2001	212
Crump	2001	84
South Warner	2001	2
South Warner	2001	1
South Warner	2001	1
South Warner	2001	1
South Warner	2001	1
South Warner	2001	1
Abert	2000	7,432
Walker Butte	2000	46
Lugnut	2000	8
Thomas	1999	1,822
Crump	1999	1,604
Drakes	1999	194
Blais	1999	59
Valley	1998	71
Wetlands	1998	40
Plantation	1998	38
Drews	1997	155
Chewaucan	1997	34
Alder Ridge	1996	3,572
Dingo	1996	407
Fish Creek	1996	382
Flat	1996	191
Marsh	1996	116
Hotchkiss	1996	110
Leman	1996	69
Squirrel	1996	63
Boilermaker	1996	50
Blaisdell	1996	49
Sugar	1996	20
Cinder Butte	1995	11,132
Owen	1995	1,177
Blue	1995	250
Sprague	1995	143
Jeep	1995	77
Spaulding	1994	1,948
Weekly	1994	17
Robinson Spring	1992	10,882



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Lake County

5,350,506 Acres: (8,360 Sq. Miles)



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Fort Spring	1992	1,594
Onion	1992	1,040
Hole In The Ground	1992	521
Hole In The Ground	1992	521
Ludi2	1992	488
Disappointment	1992	215
Rim	1992	205
Bare Flat	1992	186
Red Butte	1992	140
Red Butte	1992	140
Chewaucan	1992	78
Long Prairie	1992	58
Lava Butte	1992	34
Antelope	1991	162
Swamp	1990	289
Dog Lake	1990	145
Ennis Butte	1989	1,462
Spring Skyline	1989	1,077
Ennis	1989	781
Dragon	1989	51
South Hart	1988	3,109
Glass B	1988	762
Strawberry	1988	251
McMarty	1988	116
Grizzly	1988	77
Horse Mountain	1987	4,618
Winter Rim 87	1987	1,651
Hole In The Ground	1987	725
Hole In The Ground	1987	479
Sinkeast 1	1987	454
Swamp	1987	426
Elk Butte	1987	108
Sucker Flat	1987	94
Juniper Mountain	1987	73
Sinkeast #3	1987	42
Brim Well	1987	30
RT	1987	12
Abert	1986	9,676
Dickerson	1986	2,518
Ugly	1986	1,623
Rodgers Well	1986	738
Elk Butte	1986	210
Christmas Dump	1986	186
Hogback	1986	137
Rim	1986	83
Stingley	1986	52
Connley	1986	26



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5,350,506 Acres: (8,360 Sq. Miles)



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Antelope Flat	1986	22
Lavabed	1986	2
Big Rock	1985	18,211
Church	1985	406
Hole In The Ground	1985	192
Hole In The Ground	1985	181
Terry	1985	172
Straw 13	1985	99
Whitworth Creek	1985	81
Rabbit 2	1984	26,972
Sheep Camp	1984	8,945
Abert	1984	6,639
Coyote	1984	6,514
Little Juniper	1984	5,303
GLASS BUTTE	1984	5,294
Burma	1984	5,119
Coyote	1984	4,082
Egli Rim	1984	3,812
Saunders	1984	1,862
Buffalo	1984	1,598
Calderii	1984	1,298
Calderwood	1984	1,272
Bunchy	1984	736
Smokeout	1984	129
Gerkin Rim	1984	101
Sleepy	1984	35
Bear Flat	1984	19
Sharptop	1983	62,007
Alkali Butte	1983	6,127
Horse Mountain	1983	5,099
Little Juniper	1983	3,086
Elk Butte	1983	2,233
Unknown	1983	2,183
4 Corners	1983	2,120
Peter Creek	1983	157
McBroom	1983	156
Coyote	1981	7,023
Venator	1981	1,129
Elk Butte	1981	324
Poverty	1981	265
Baurers Creek	1981	153
Coyote	1981	53
Foster Butte	1981	36
Plush	1981	< 1
McComb Butte	1980	414
Plush	1980	88
Blue Mountain	1980	16



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Abert	1979	84
Chocktoot	1978	188
Lost	1977	7,462
Green Butte	1977	1,751
Green Butte	1977	1,751
Bull	1977	232
Lava Bear	1977	6
Coyote Hills	1974	2,136
Hill Camp	1974	1,219
Sandy Seed	1974	277
Sprague Well	1973	3,001
StormX	1973	432
Clover Flat	1973	392
Yocum Burn	1973	79
Antelope Mountain	1972	255
Gerkin Well	1972	127
Robinson Place	1972	105
Lava Butte	1972	74
Bunchgrass Butte	1972	17
Abert Lake	1971	18,788
Boilout Basin	1970	614
Koshow	1970	104
Horse Mountain	1969	5,971
Punchbowl	1969	614
Rehart Canyon	1969	177
Horse Mountain	1968	5,920
Goodrich Well	1968	1,901
Skeleton	1968	1,229
Buckaroo Lake	1968	933
Saddle Butte	1968	626
Euchre Butte	1968	317
Buckaroo Lake	1968	120
Partin Butte	1968	107
Little Benjamin	1967	241
Winter Rim 66	1966	7,248
Toolbox	1966	736
Black Cap	1964	293
Blue Creek	1964	278
Wastina	1964	167
Wright Ranch	1962	824
Devils Garden	1961	10,011
Bennett Flat	1961	147
Coyote Flat	1961	42
Shoestring	1960	1,085
Wastina	1960	786
Blue Creek	1960	627
KFPA640	1960	483



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Lake County

5,350,506 Acres: (8,360 Sq. Miles)



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Parsnip Spring	1960	295
Aspen Flat	1959	15,577
Aspen Flat	1959	12,571
Honey Creek	1959	1,389
Horseshoe Butte	1959	87
Onion Knoll 57	1957	114
South Peak	1957	99
Round Butte	1955	3,583
Summer Lake Rim	1955	2,559
Onion Knoll	1955	204
Fort Rock BLM	1955	202
B S Tanks D-3	1955	196
BS Tanks D-3	1955	196
Fort Rock BLM	1955	184
Upper Bridge Creek	1955	143
Fort Rock BLM	1955	1
Mill Flat	1954	1,058
Lower Bridge Creek	1954	118
Ben Young Creek	1953	246
Camp Creek	1951	3,632
Dog Lake Burn	1951	358
Willow Creek	1951	207
Slide Lakes	1950	28
Island Burn	1949	161
DISMAL SWAMP	1935	21
Cox Creek	1931	11,690
White Rock	1929	992
Albertson Reservoir	1928	174
SECTION 22	1928	34
Dicks Creek	1927	109
Bobs Lake	1926	9,416
Baggy Lake	1926	121
Wildhorse Draw	1926	108
Brushy	1926	22
Antelope Spring	1925	942
Watson Well	1924	4,339
Bagley Mill	1924	531
Howard Creek	1924	314
Reed Corrals	1924	301
Hager Mountain	1924	253
Klipple 24	1924	129
Summer Lake	1923	283
Cox Crick	1922	59
Shepherd	1920	145
Shepherd	1920	145
Ryan Cabin	1916	74
South Ice Cave	1915	11,912



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Lake County

5,350,506 Acres: (8,360 Sq. Miles)



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South Ice Cave	1915	11,895
Long Butte	1915	3,011
Long Butte	1915	3,011
Mortimer Well	1915	844
Boundry Road	1915	705
Boundary Road	1915	705
Pyramid	1915	335
Pyramid	1915	335
Watkins Flat	1915	288
Watkins Flat	1915	232
Wigtop Butte	1915	184
Wigtop Butte	1915	184
Buck Butte	1915	115
Buck Butte	1915	115
UNNAMED	1915	72
Stage Station	1914	5,545
Stage Station	1914	5,320
Katati Butte	1914	225
Katati Butte	1914	225
Pine Lake	1914	145
Pine Lake	1914	145
Hole In The Ground	1913	284
Hole In The Ground	1913	47
Hole In The Ground	1912	400
Hole In The Ground	1912	400
Steigleder Well	1912	72
Gebhard Well	1910	581
Gebhard Well	1910	581
Owen Butte	1900	1,813
Horseshoe Rim	1900	1,377
Fox Hill	1900	1,372
Razorback	1900	1,004
Deer Spring	1900	676
Rock Creek	1900	428
Fisk	1900	377
Upper Drews Creek	1900	223
Salt Creek	1900	201
Camas	1900	174
Crane Lake	1900	171
Razor 2	1900	147
Barnes Rim	1900	112
Box Spring	1900	62
Owen Butte	0000	1,813
Horseshoe Rim	0000	1,377
Fox Hill	0000	1,372
Razorback	0000	1,004
Deer Spring	0000	676



Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)



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Rock Creek	0000	428
Fisk	0000	377
UNKNOWN	0000	347
UNKNOWN	0000	347
St. Patrick?	0000	234
UNKNOWN	0000	232
Upper Drews Creek	0000	223
Salt Creek	0000	201
Camas	0000	174
Crane Lake	0000	154
Razor 2	0000	147
Barnes Rim	0000	112
Unknown	0000	103
UNKNOWN	0000	75
Unknown	0000	33
UNKNOWN	0000	16
UNKNOWN	0000	11
Coglan	0000	8
UNKNOWN	0000	7
UNKNOWN	0000	4
UNKNOWN	0000	4

Source: National Interagency Fire Center: <https://www.nifc.gov/>

For more information about previous large wildfires, see: National Interagency Fire Center https://www.nifc.gov/fireInfo/fireInfo_main.html



Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)



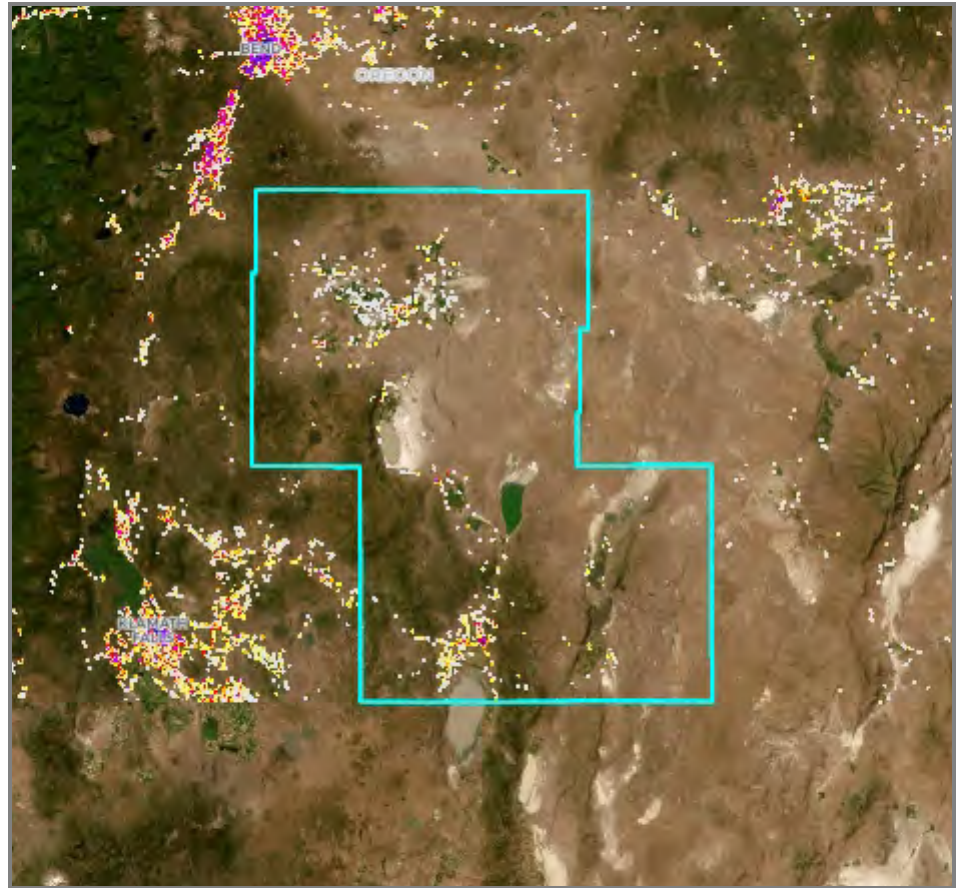
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HOUSING DENSITY - WHERE PEOPLE LIVE

Areas where people live are a primary concern when assessing wildfire risk. Especially critical is the Wildland Urban Interface (WUI) - areas where houses and other development meet or mix with undeveloped natural areas, with a close proximity of houses and infrastructure to flammable wildland vegetation.

In the U.S., the number of homes in the WUI increased by 13.4 million since 1990. This expansion of the WUI poses particular challenges for wildfire management, creating more structures and populations at risk in environments where firefighting is often difficult. In Oregon, nearly 2.4 million acres are considered WUI areas, about 3.8% of the state. Of the nearly 1.7 million homes in Oregon, over 603,000, or 36%, are in the WUI.

The map and table on this page shows the location and density of where people live in your area.



Lake County housing density

Category	Acres	%*
<1 house per 40 acres	26,485	< 1
1 per 40 acres to 1 per 20 acres	10,544	< 1
1 per 20 acres to 1 per 10 acres	6,123	< 1
1 per 10 acres to 1 per 5 acres	2,675	< 1
1 per 5 acres to 1 per 2 acres	1,075	< 1
1 per 2 acres to 3 per acres	1,069	< 1
> 3 per acres	164	< 1

Source: 2013 West Wide Wildfire Risk Assessment, ODF

* Values may add up to over 100% due to rounding precision



Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)



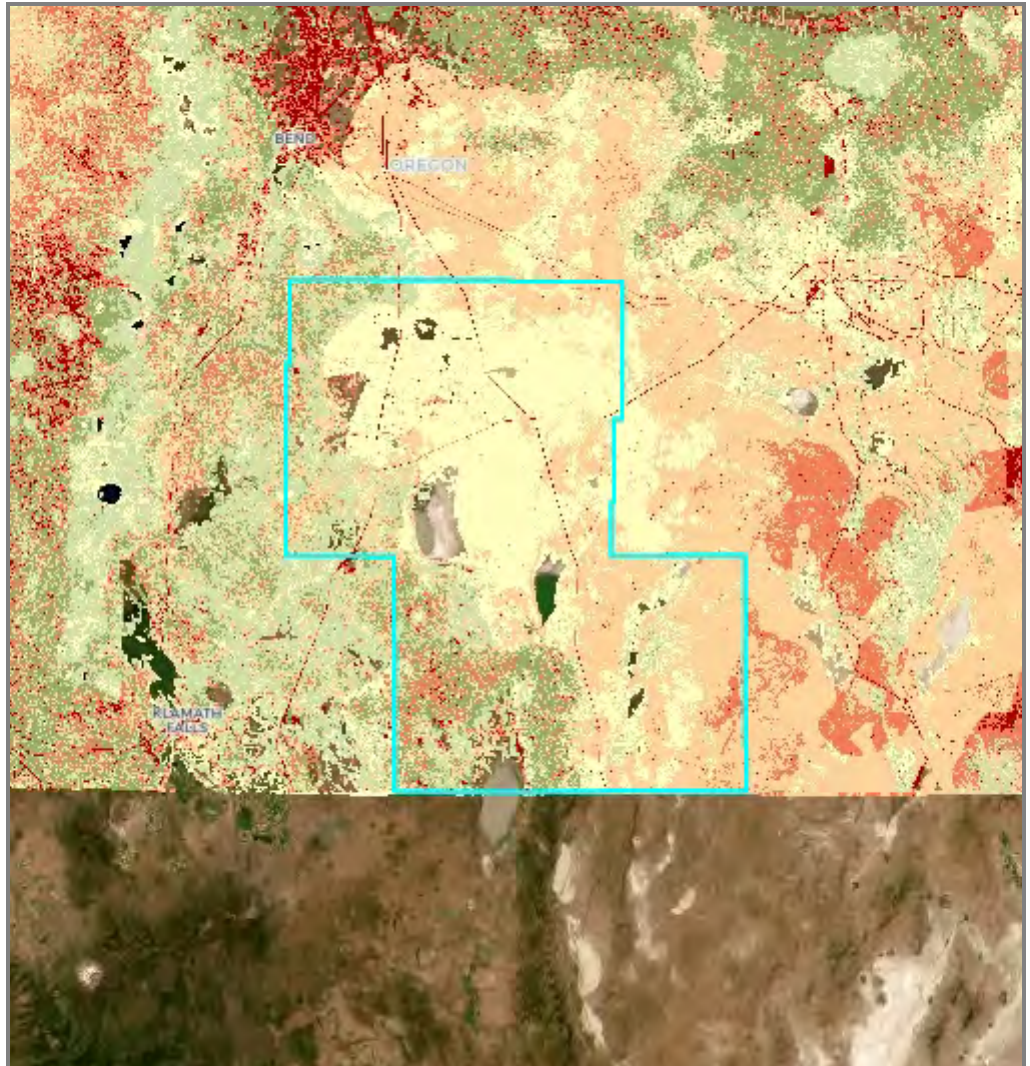
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OVERALL WILDFIRE RISK

Overall wildfire risk combines both the likelihood of a wildfire and the expected impacts of a wildfire on highly valued resources and assets. (See other sections for more information on Burn probability and Overall potential impact.) Overall wildfire risk also reflects the susceptibility of resources and assets to wildfire of different intensities, and the likelihood of those intensities.

Mapped resources and assets include critical infrastructure, developed recreation, housing unit density, seed orchards, sawmills, historic structures, timber, municipal watersheds, vegetation condition, and terrestrial and aquatic wildlife habitat.

The data values in the overall wildfire risk map and chart reflect a range of impacts from a very high negative value, where wildfire is detrimental to one or more resources or assets, to positive, where wildfire has an overall benefit (e.g., forest health or wildlife habitat).



Overall wildfire risk: Legend

	Very High	Wildfire risk is very highly negative (top 5% of values).
	High	Wildfire risk is highly negative (80th to 95th percentile).
	Moderate	Wildfire risk is moderately negative (50th to 80th percentile).
	Low	Wildfire risk is slightly negative(29th to 50th percentile).
	Low Benefit	Wildfire is slightly beneficial (14.5 to 29th percentile).
	Benefit	Wildfire is beneficial overall (0-14.5th percentile).
	Non-burnable	There are no highly valued resources or assets mapped in the area, or it is considered non-burnable (urban, agriculture, etc).



Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)



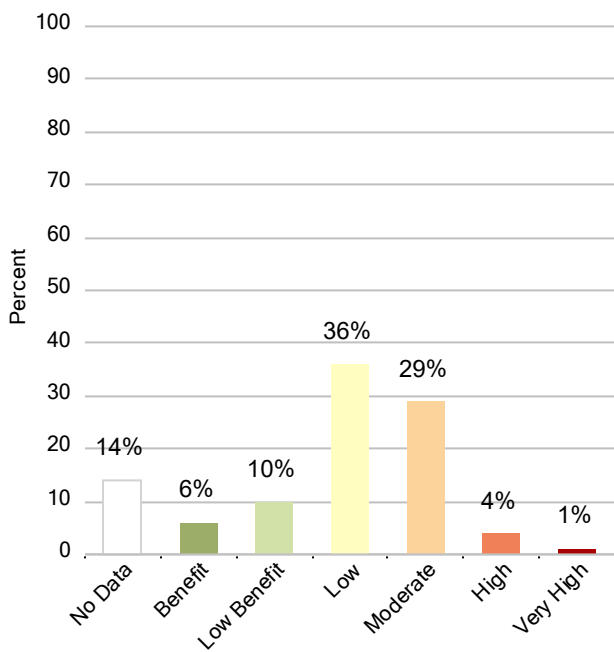
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This page contains additional information about overall wildfire risk, including a table of classes by ownership to determine the distribution of categories across ownerships, and a chart of overall percentages of classes across the area. The inset box displays sub-watershed summaries for landscape-scale prioritization.

Overall wildfire risk in Lake County: estimated acres by ownership

Category	Total	Private	Local	State	BLM	USFS	USFWS	Other Fed	Tribal
Very High	34,076	11,454	37	1,128	13,560	7,771	123	3	0
High	202,561	50,710	17	1,373	56,364	93,696	375	26	0
Moderate	1,502,623	221,918	197	48,421	838,284	203,199	190,524	35	45
Low	1,915,968	373,314	22	25,908	1,365,087	88,146	60,949	2,396	146
Low Benefit	514,990	153,764	24	3,122	29,360	310,459	18,261	0	0
Benefit	341,106	97,567	75	144	1,809	240,711	800	0	0
No Data	759,189	335,047	42	37,319	296,359	82,434	7,737	245	6
Total Area	5,270,513	1,243,774	414	117,415	2,600,823	1,026,416	278,769	2,705	197

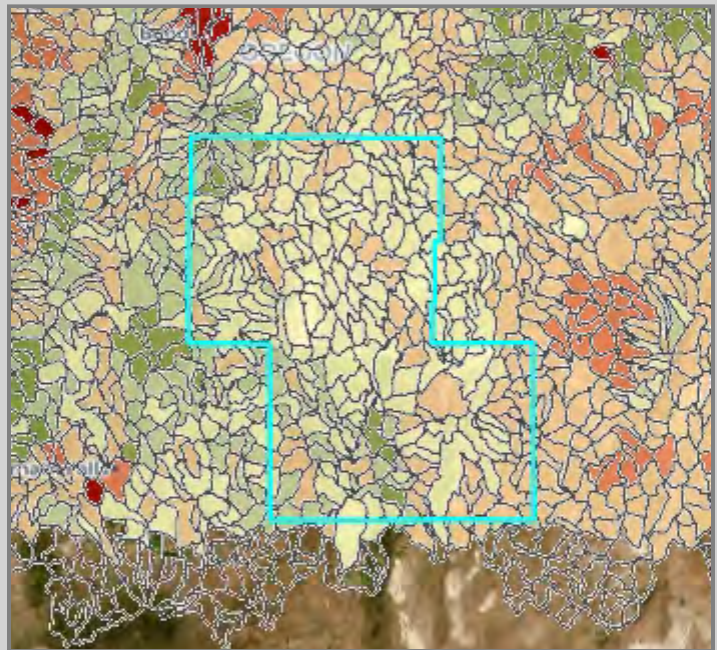
Overall wildfire risk in Lake County *



Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

* Values may add up to over 100% due to rounding precision

Overall wildfire risk in Lake County: sub-watershed summary map. Overall wildfire risk is summarized at the sub-watershed (6th field Hydrologic Unit Code, HUC12) level. Watershed summaries enable you to view the landscape context and identify and compare sub-watersheds for prioritization.





Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)

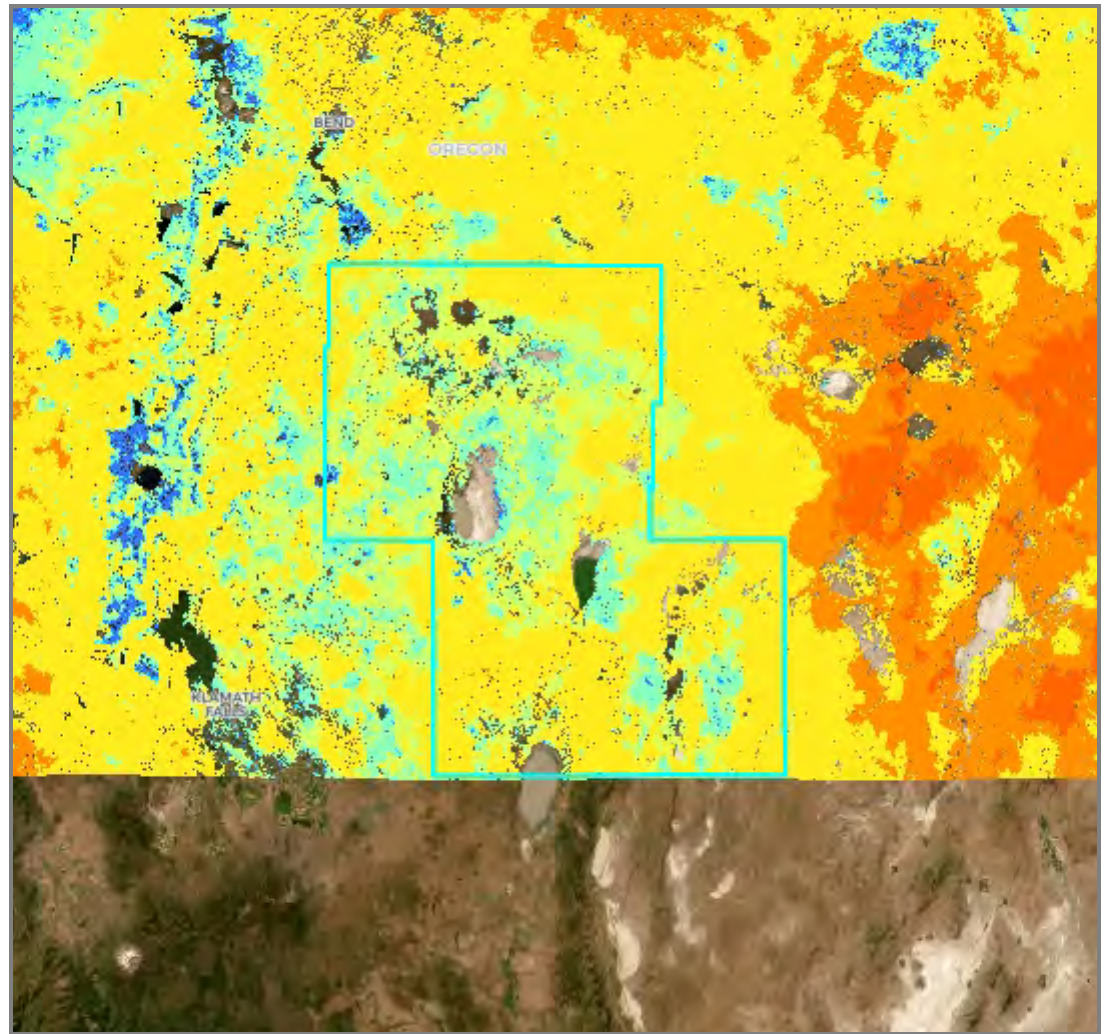


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BURN PROBABILITY

Burn probability shows the annual likelihood of a wildfire greater than 250 acres in size occurring, considering weather, topography, fire history, and fuels (vegetation). This estimate includes fire history from 1992 through recently disturbed fuels from large Oregon wildfires in notable years 2013, 2014, 2015, and 2017.

Only large wildfires over 250 acres in size are included because they are the most influential on the landscape and they can be simulated using computer software. Most fire occurrences are less than 250 acres (see fire history section). Although these smaller fires have a low impact on the broader landscape, they can have significant local impacts, especially in areas with human activity and infrastructure.



Burn probability	
Very High	Greater than 1 in 50 chance of a wildfire >250 acres in a single year (>96th percentile).
High-Very High High	Between 1 in 500 and 1 in 50 chance of a wildfire >250 acres in a single year (29th to 96th percentile).
Moderate-High Moderate	Between 1 in 5,000 and 1 in 500 chance of a wildfire >250 acres in a single year (11th to 29th percentile).
Low-Moderate Low	Less than approximately 1 in 5,000 chance of a wildfire >250 acres in a single year (up to the 11th percentile).
Non-burnable	This area contains non-burnable fuel types such as water, urban, agriculture, barren rock, etc.



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Lake County

5,350,506 Acres: (8,360 Sq. Miles)



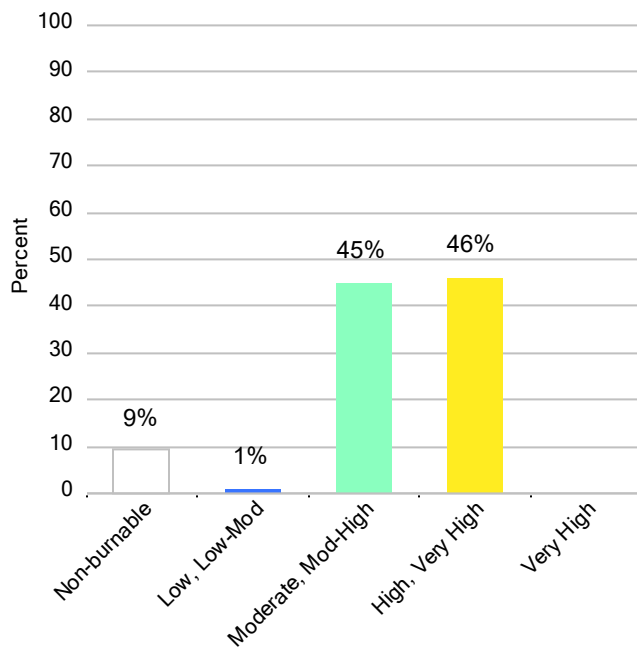
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This page contains additional information about burn probability, including a table of classes by ownership to determine the distribution of categories across ownerships, and a chart of overall percentages of classes across the area. The inset box displays sub-watershed summaries for landscape-scale prioritization.

Burn probability in Lake County: estimated acres by ownership

Category	Total	Private	Local	State	BLM	USFS	USFWS	Other Fed	Tribal
Very High	0	0	0	0	0	0	0	0	0
High, Very High	2,405,651	524,757	316	59,158	1,077,189	573,919	170,312	0	0
Moderate, Mod-High	2,371,481	559,791	73	26,595	1,277,426	406,759	98,144	2,502	191
Low, Low-Mod	44,569	9,605	0	219	19,798	12,888	2,059	0	0
Non-Burnable	448,808	149,621	26	31,443	226,408	32,849	8,253	202	6
Total Area.	5,270,509	1,243,774	415	117,415	2,600,821	1,026,415	278,768	2,704	197

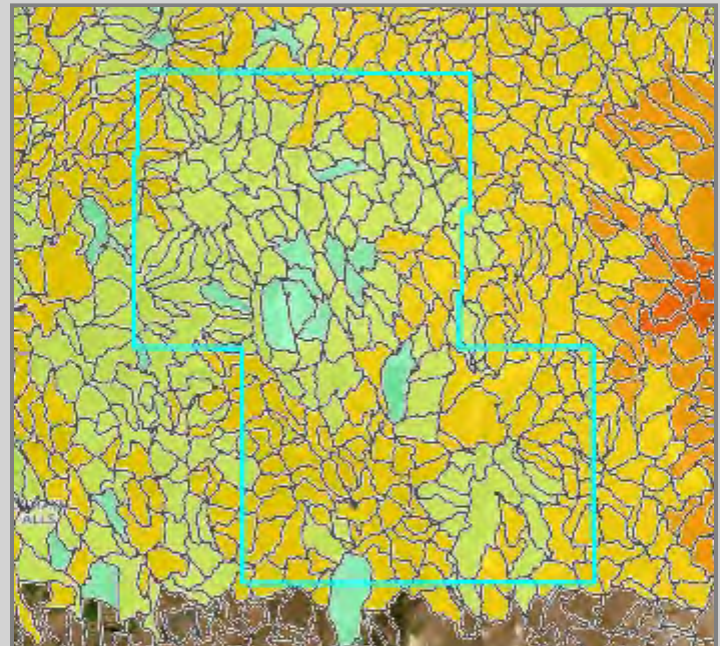
Burn probability in Lake County *



Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

* Values may add up to over 100% due to rounding precision

Burn probability in Lake County: sub-watershed summary map. Burn probability is summarized at the subwatershed (6th field Hydrologic Unit Code, HUC12) level. Watershed summaries enable you to view the landscape context and identify and compare sub-watersheds for prioritization.





Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)



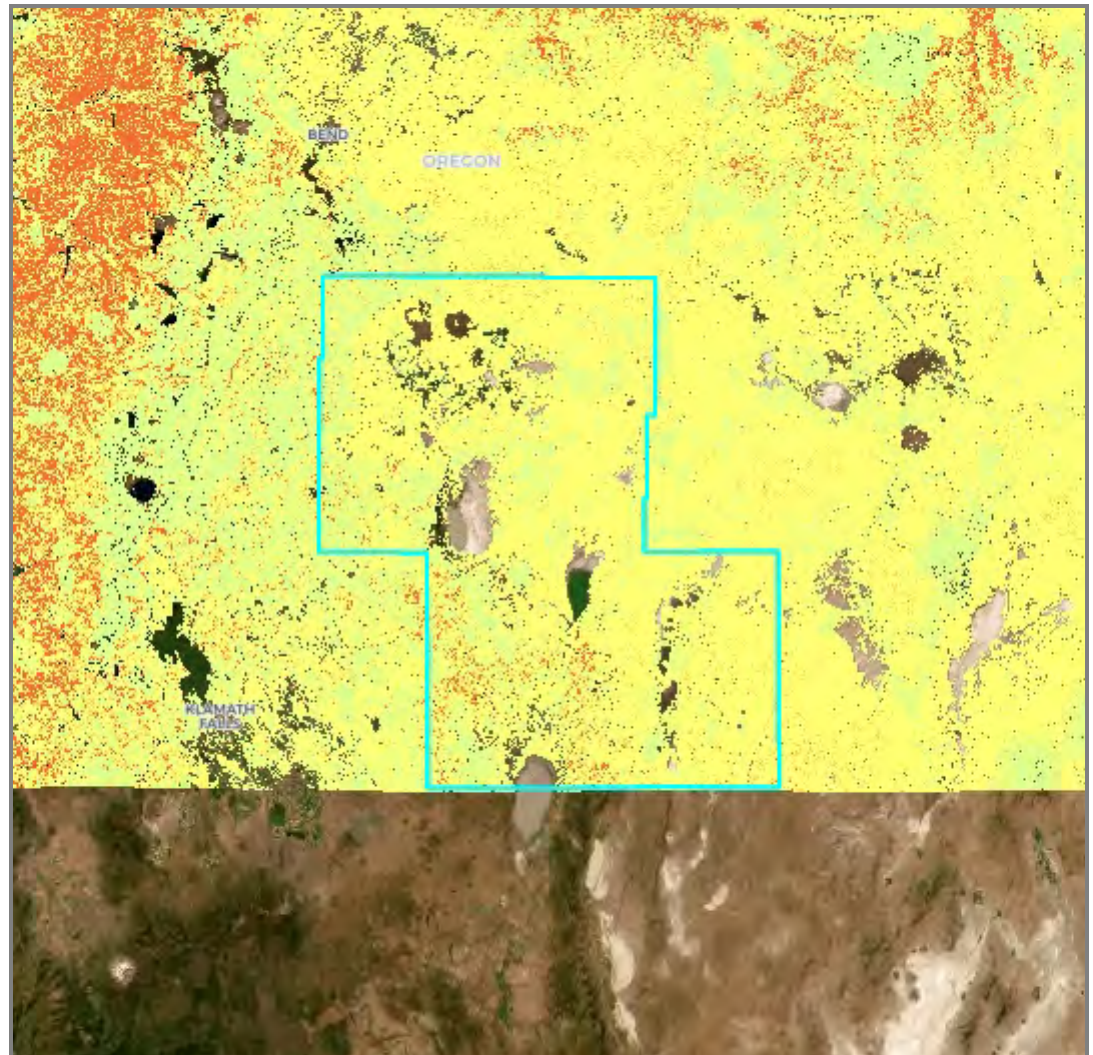
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FIRE INTENSITY - FLAME LENGTHS






Flame length is an indication of fire intensity, which is a primary factor to consider for gauging potential impacts to values at risk and for firefighter safety. It can also guide mitigation work to reduce the potential for catastrophic fires by reducing fire intensity and flame length.

Under normal weather conditions average flame lengths within your area are shown, and the associated table describes the expected fire behavior in each average flame length category.

Conditions vary widely with local topography, fuels, and local weather, especially local winds. In all areas, under warm, dry, windy, and drought conditions, expect higher likelihood of fire starts, higher fire intensities, more ember activity, a wildfire more difficult to control, and more severe impacts.



Average fire intensity - flame lengths under normal weather conditions

 > 11 foot	Fires may exhibit greater than 11-foot average flames with major fire movement, tree crowning, longer-range spotting and ember travel.
 8-11 foot	Fires may exhibit 8-11 foot average flames with tree torching and increased ember travel.
 4-8 foot	Fires may exhibit 4-8 foot average flames, and embers may travel moderate distances.
 4 foot	Fires may exhibit 4 foot average flames.
 Non-burnable	This area contains non-burnable fuel types such as water, urban, agriculture, barren rock, etc.



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Lake County

5,350,506 Acres: (8,360 Sq. Miles)



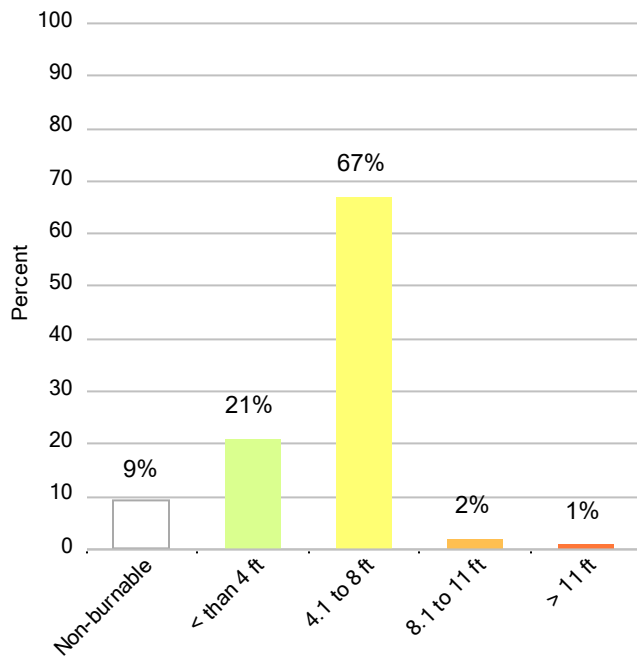
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This page contains additional information about fire intensity, including a table of classes by ownership to determine the distribution of categories across ownerships, and a chart of overall percentages of classes across the area. The inset box displays sub-watershed summaries for landscape-scale prioritization.

Lake County average fire intensity - flame lengths estimated acres by ownership

Category	Total	Private	Local	State	BLM	USFS	USFWS	Other Fed	Tribal
> 11 ft	74,277	18,366	12	99	4,533	50,649	618	0	0
8 - 11 ft	129,673	28,705	44	723	33,437	59,600	7,162	0	2
4 - 8 ft	3,514,494	711,753	297	72,915	2,003,000	487,683	236,546	2,127	173
> 0 - 4 ft	1,103,256	335,329	35	12,235	333,443	395,633	26,189	376	16
Non-burnable	448,808	149,621	26	31,443	226,408	32,849	8,253	202	6
Total Area	5,270,508	1,243,774	414	117,415	2,600,821	1,026,414	278,768	2,705	197

Fire intensity - flame length in Lake County *

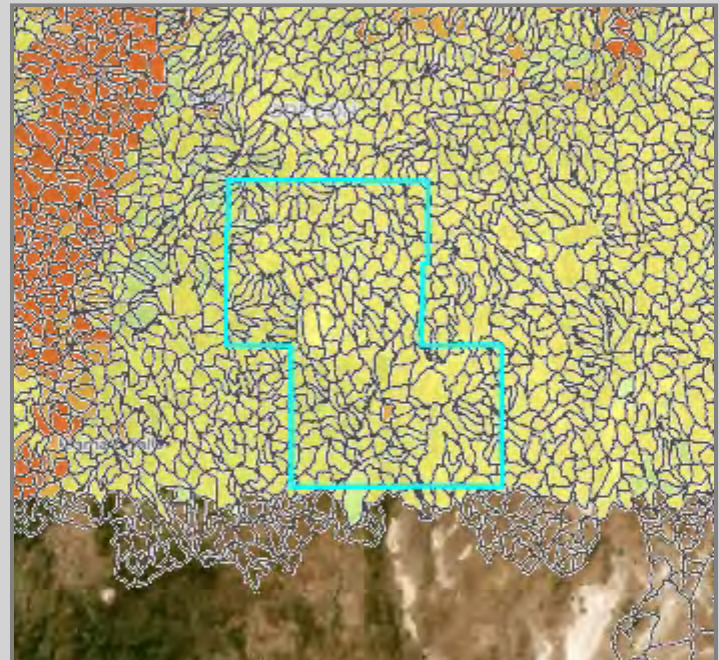


Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

* Values may add up to over 100% due to rounding precision

Fire intensity in Lake County: sub-watershed summary map.

Fire intensity is summarized at the subwatershed (6th field Hydrologic Unit Code, HUC12) level. Watershed summaries enable you to view the landscape context and identify and compare sub-watersheds for prioritization.





Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)



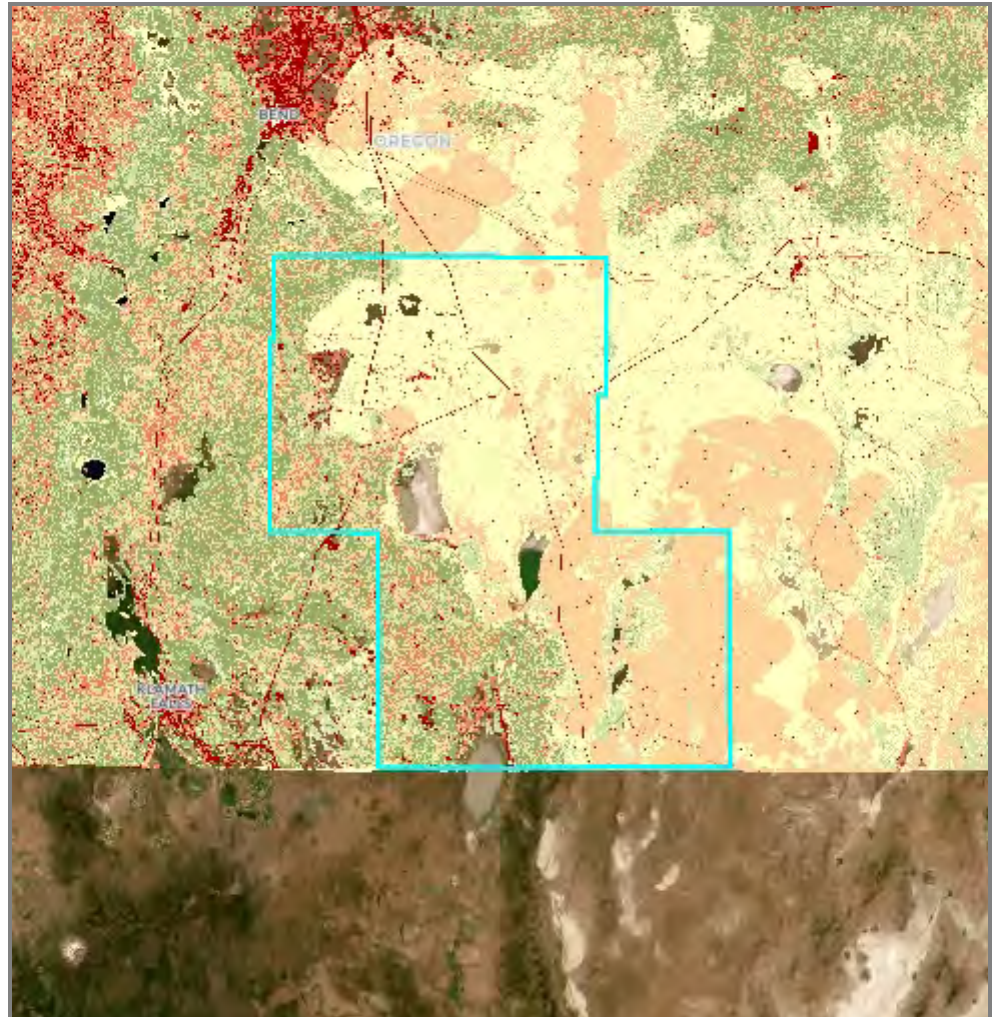
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OVERALL POTENTIAL IMPACT

Overall potential impact represents the exposure or consequence of wildfire on all mapped highly valued assets and resources combined, including critical infrastructure, developed recreation, housing density, seed orchards, sawmills, historic structures, timber, municipal watersheds, vegetation condition, and selected terrestrial and aquatic wildlife habitat.

The Potential Impact data layers characterize exposure and susceptibility only, and do not include the likelihood of an area burning. This differentiates the Potential Impact layers from Wildfire Risk layers, which account for the burn probability in the risk rating.

The data values reflect a range of impacts from a very high negative consequence, where wildfire is detrimental (e.g., high exposure to structures, infrastructure, or sensitive habitat), to a positive impact of wildfire, where wildfire will produce an overall benefit (e.g., improving forest health or wildlife habitat).



Overall potential impact (if a wildfire were to occur)

	Very High	Overall potential impact is very highly negative (top 5% of values).
	High	Overall potential impact is highly negative (80-95th percentile).
	Moderate	Overall potential impact is moderately negative (50-80th percentile).
	Low	Overall potential impact is slightly negative (30-50th percentile).
	Low Benefit	Overall potential impact is slightly beneficial at low flame lengths (15-30th percentile).
	Benefit	Overall potential impact is slightly beneficial, with a cumulative positive impact of fire (0-15th percentile).
	No Data (blank)	There are no highly valued resources or assets mapped in the area or it is non-burnable (urban, agriculture, barren, etc).



Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)



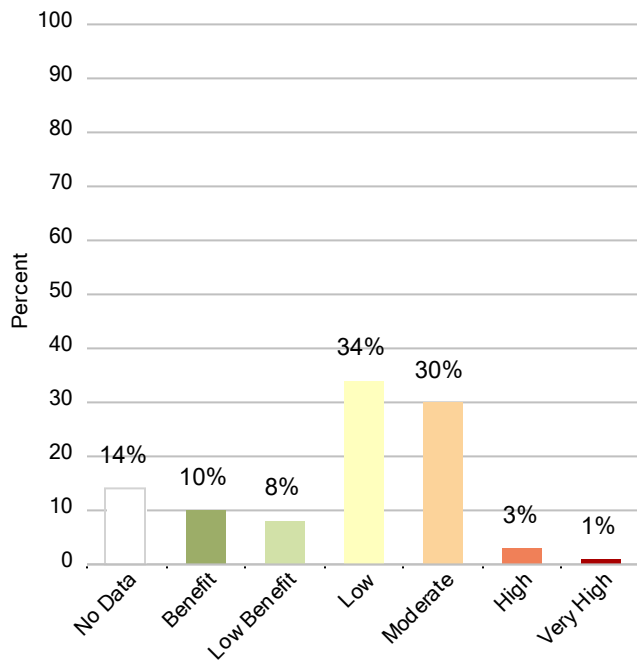
Generated: July 6, 2024

This page contains additional information about overall potential impact, including a table of classes by ownership to determine the distribution of categories across ownerships, and a chart of overall percentages of classes across the area. The inset box displays sub-watershed summaries for landscape-scale prioritization.

Lake County overall potential impact estimated acres by ownership

Category	Total	Private	Local	State	BLM	USFS	USFWS	Other Fed	Tribal
Very High	56,531	21,670	36	1,431	26,843	6,276	244	31	0
High	173,963	67,082	15	1,080	14,602	90,900	234	27	23
Moderate	1,576,848	209,888	206	43,534	896,498	213,112	213,568	5	37
Low	1,775,627	323,375	16	28,171	1,314,035	73,389	34,116	2,396	129
Low Benefit	417,614	136,923	46	5,603	47,643	207,772	19,626	0	1
Benefit	510,731	149,788	52	277	4,841	352,531	3,242	0	0
No Data	759,189	335,047	42	37,319	296,359	82,434	7,737	245	6
Total Area	5,270,503	1,243,773	413	117,415	2,600,821	1,026,414	278,767	2,704	196

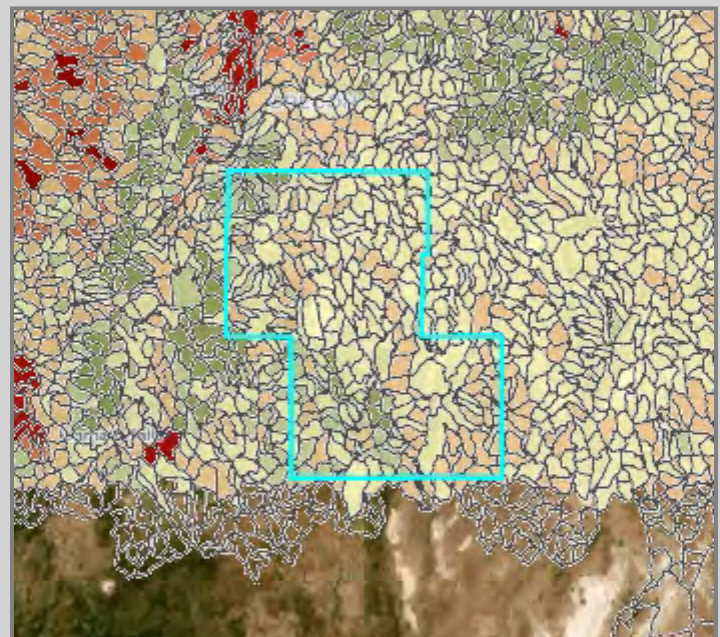
Overall potential impact in Lake County *



Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

* Values may add up to over 100% due to rounding precision

Overall potential impact in Lake County: sub-watershed summary map. Overall potential impact is summarized at the sub-watershed (6th field Hydrologic Unit Code, HUC12) level. Watershed summaries enable you to view the landscape context and identify and compare sub-watersheds for prioritization.





Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)



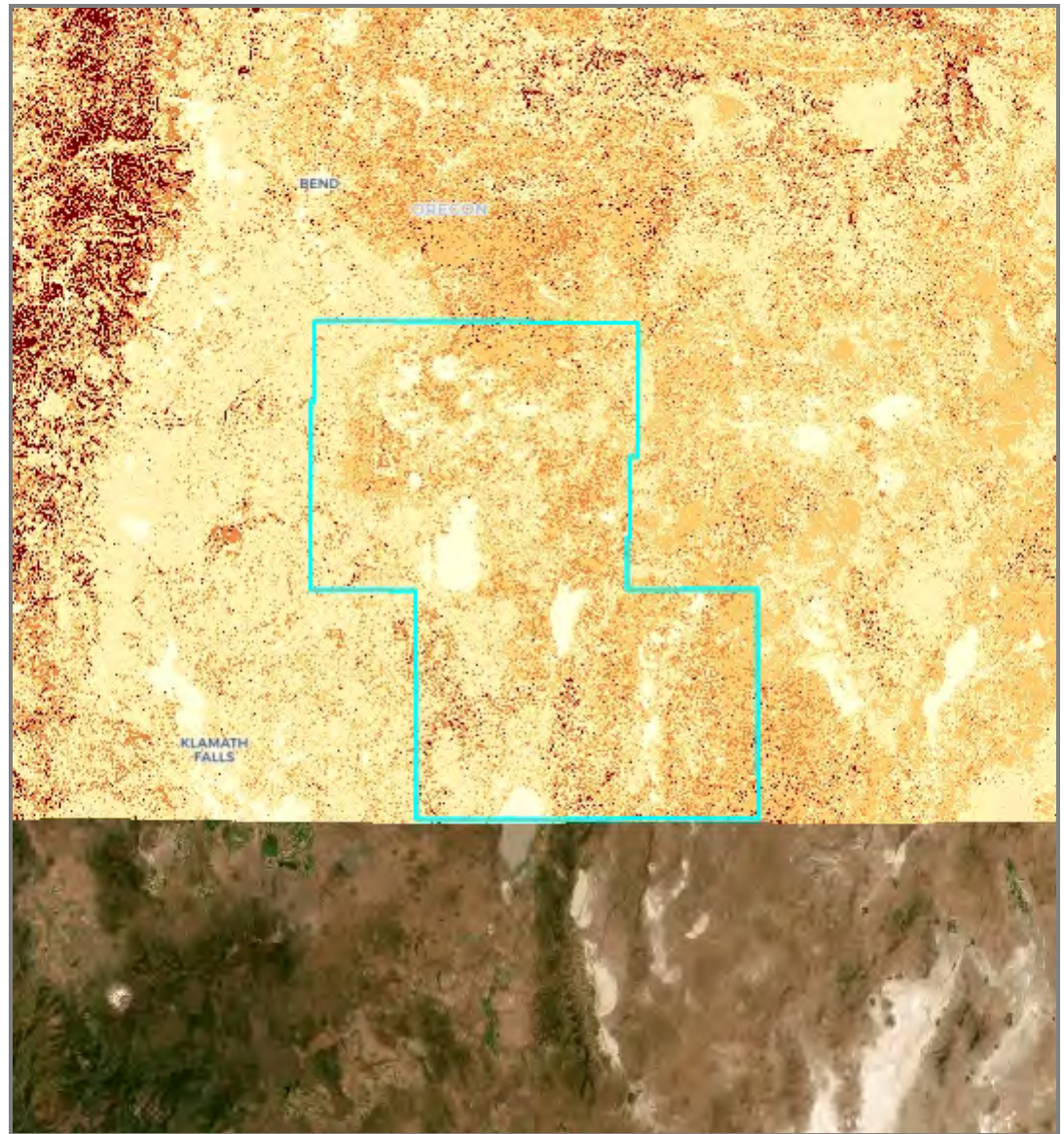
Generated: July 6, 2024

HAZARD TO POTENTIAL STRUCTURES

Hazard to potential structures depicts the hazard to a hypothetical structure (not necessarily an existing structure) if a wildfire were to occur. Hazard to potential structures differs from overall estimates of wildfire impact or risk, as those estimates only consider where existing structures are currently located.

Community planners can use this information when planning development outside of existing developed, urban or WUI areas. This data provides model-based consideration of wildfire hazard when developing Fire Adapted Communities in Oregon.

As with the other data layers, this layer characterizes the fire environment only and does not consider other important factors in determining structural fire risk such as building construction materials and vegetation within close proximity of a structure.



Hazard to potential structures

	Very High	Potential hazard is very high (top 5 percent).
	High	Potential hazard is high (80th to 95th percentile).
	Moderate	Potential hazard is moderate (50th to 80th percentile).
	Low	Potential hazard is low (up to the 50th percentile).
	Non-Burnable	Fuel in the area is largely non-burnable or very sparse.



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Lake County

5,350,506 Acres: (8,360 Sq. Miles)



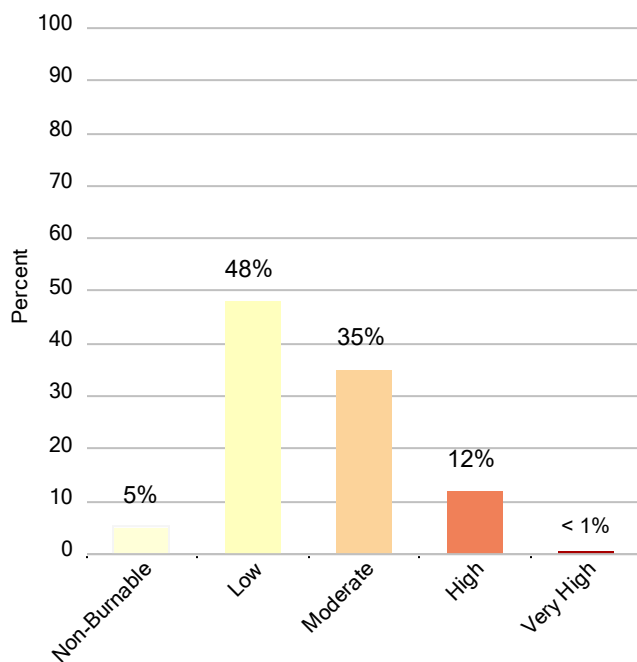
Generated: July 6, 2024

This page contains additional information about hazard to potential structures, including a table of classes by ownership to determine the distribution of categories across ownerships, and a chart of overall percentages of classes across the area. The inset box displays sub-watershed summaries for landscape-scale prioritization.

Hazard to potential structures in Lake County: estimated acres by ownership

Category	Total	Private	Local	State	BLM	USFS	USFWS	Other Fed	Tribal
Very High	35,499	8,397	10	233	12,254	12,343	2,262	0	0
High	625,451	115,559	84	13,089	326,724	121,172	48,627	156	40
Moderate	1,834,551	321,849	137	46,785	1,156,918	171,356	136,254	1,146	106
Low	2,514,284	736,604	182	30,398	945,622	710,104	89,921	1,402	51
Non-Burnable	260,722	61,366	0	26,909	159,303	11,440	1,704	0	0
Total Area	5,270,507	1,243,775	413	117,414	2,600,821	1,026,415	278,768	2,704	197

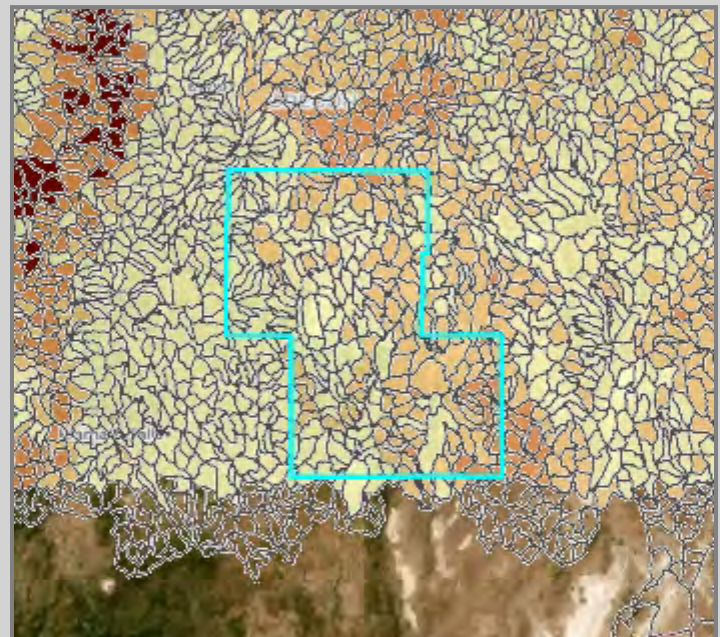
Hazard to potential structures in Lake County *



Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

* Values may add up to over 100% due to rounding precision

Hazard to potential structures in Lake County: sub-watershed summary map. Hazard to potential structures is summarized at the subwatershed (6th field Hydrologic Unit Code, HUC12) level. Watershed summaries enable you to view the landscape context and identify and compare sub-watersheds for prioritization.





Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)



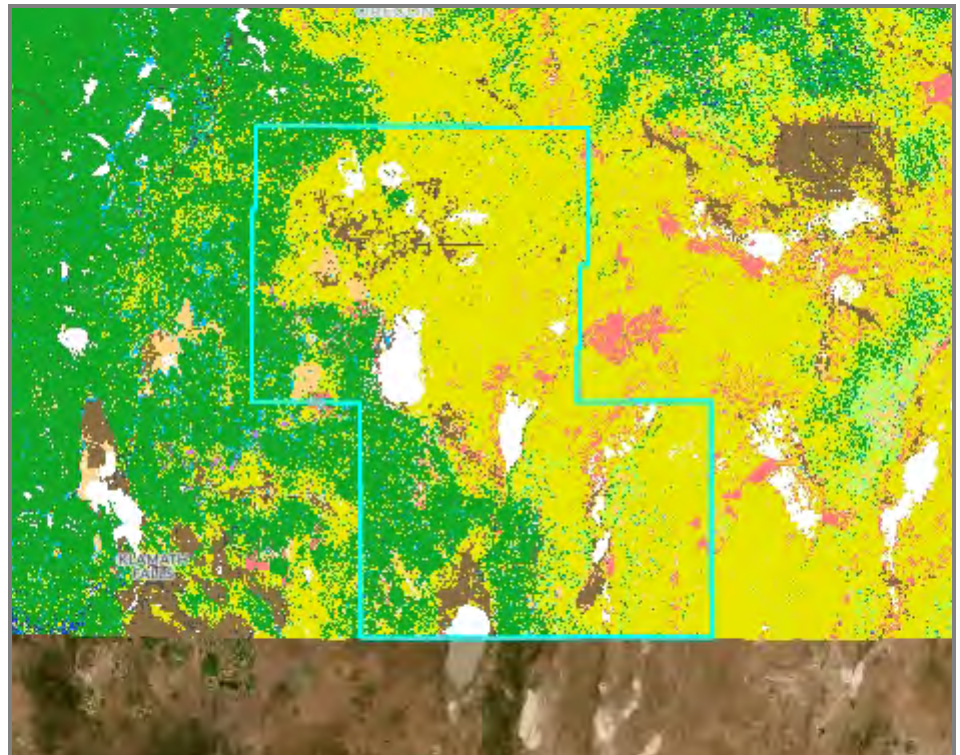
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EXISTING VEGETATION TYPE

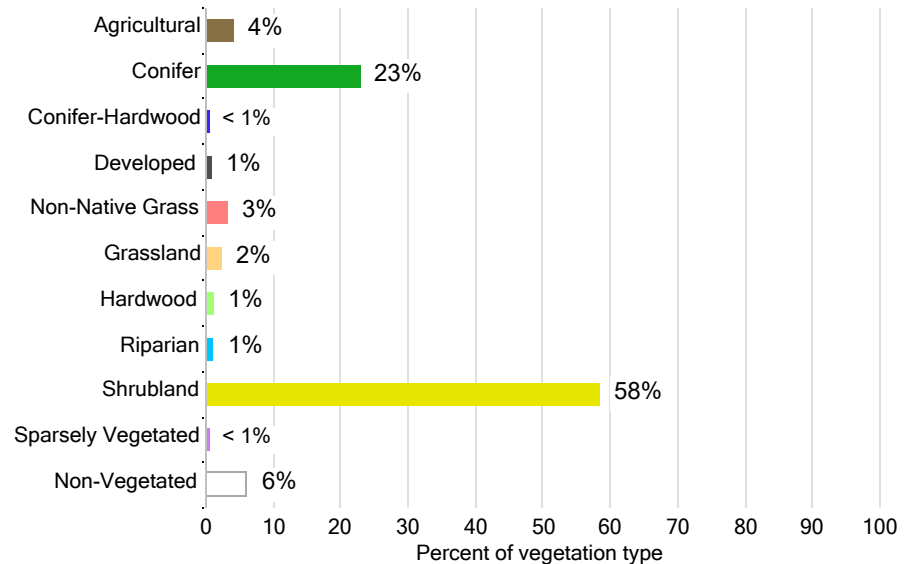
Vegetation is an important influence on potential wildfire behavior. The dominant vegetation type helps us understand the corresponding historical fire regime, a designation of fire frequency and severity. Fire frequency, or burn probability, suggests how often wildfire occurs (see Burn probability data layer). Fire severity tells us how much impact wildfires are likely to have on the vegetation and other elements of an ecosystem (see Potential impact to forest vegetation data layer). The living and dead vegetation below forest canopies (shrubs, grasses, leaf litter, dead tree snags, etc.) also strongly influence fire behavior and impacts in a location (see Fuel models).

Higher frequency fire areas generally have lower severities. Vegetation is continually or often thinned by fire and the remaining vegetation and other ecosystem elements can be considered adaptive or resilient to fire. Examples include Ponderosa pine forests and oak woodlands.

Lower frequency fire regimes experience less fire, but generally have higher severities, with vegetation and other ecosystem elements which can be considered sensitive. Examples include coastal forests, subalpine forests and many stream headwaters and riparian areas.



Vegetation Types in Lake County





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Lake County

5,350,506 Acres: (8,360 Sq. Miles)



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Lake County vegetation type

Category	Description	Acres	%*
Non-vegetated or recently disturbed	Non-vegetated	327,935	6
Agricultural	Agricultural	217,621	4
Conifer	Conifer	1,224,135	23
Conifer-Hardwood	Conifer-Hardwood	449	< 1
Developed	Developed	39,997	< 1
Exotic Herbaceous	Non-Native Grass	172,815	3
Grassland	Grassland	120,705	2
Hardwood	Hardwood	63,141	1
Riparian	Riparian	54,563	1
Shrubland	Shrubland	3,123,511	58
Sparsely Vegetated	Sparsely Vegetated	5,212	< 1

Existing Vegetation Type Data Dictionary <https://www.landfire.gov/evt.php>

Source: LANDFIRE <https://www.landfire.gov>

Resource:

US Forest Service Fire Regime Table

https://www.fs.fed.us/database/feis/fire_regime_table/fire_regime_table.html#PacificNorthwest

* Values may add up to over 100% due to rounding precision



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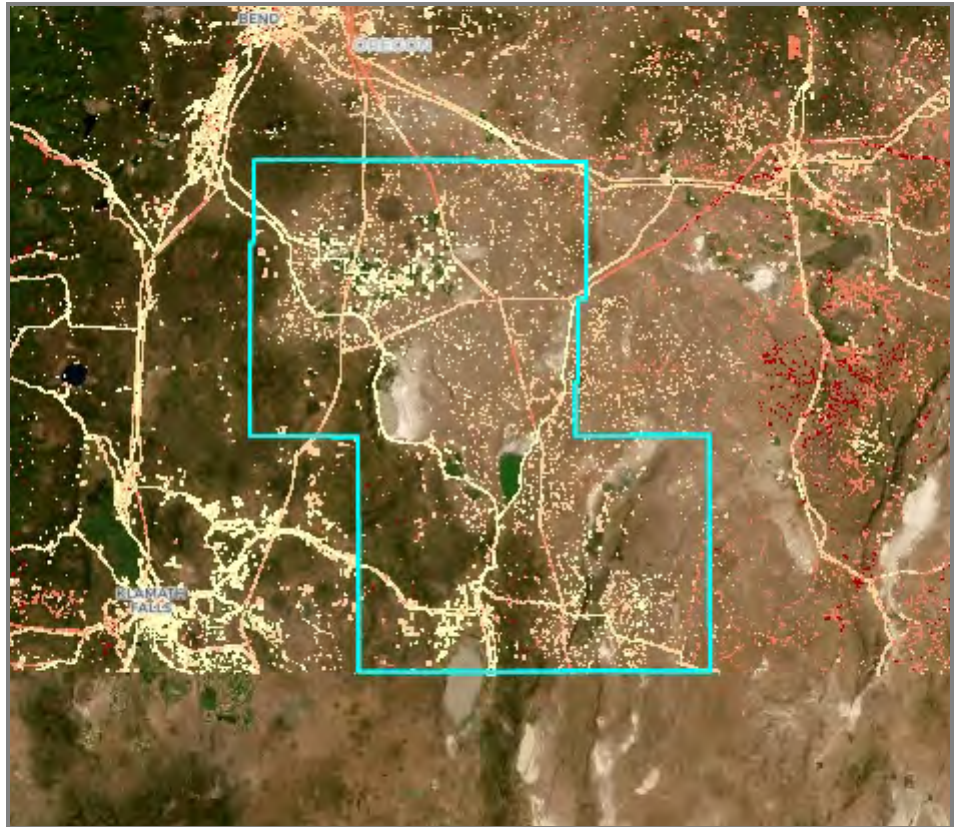
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WILDFIRE RISK TO ASSETS

Wildfire risk combines both the likelihood of a wildfire (or Burn probability) and the expected effects of a wildfire on highly valued resources and assets. See the description of Overall wildfire risk for more details.

Wildfire risk to assets maps wildfire risk only in places with the following assets: critical infrastructure, developed recreation, housing unit density, seed orchards, sawmills, and historic structures. Note that these resources and assets were mapped at a broad scale across all of Oregon and Washington, and maps contain errors and omissions, especially at fine scales.

The values in the maps and charts reflect a range of negative impacts from low to very high. Positive benefits of wildfire are not mapped in this layer, assuming that any impact of wildfire to human development is negative.



Wildfire Risk to Assets in Lake County

Category	Description	Acres	%*
Very High	Wildfire risk is very highly negative to all combined mapped assets (top 5%).	384	< 1
High	Wildfire risk is highly negative (80-95th percentile).	8,555	< 1
Moderate	Wildfire risk is moderately negative (50-80th percentile).	55,281	1
Low	Wildfire risk is slightly negative (0-50th percentile).	48,078	< 1
No Data	There are no highly valued resources or assets mapped in the area, or it is considered non-burnable.	5,238,180	98

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

* Values may add up to over 100% due to rounding precision



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5,350,506 Acres: (8,360 Sq. Miles)



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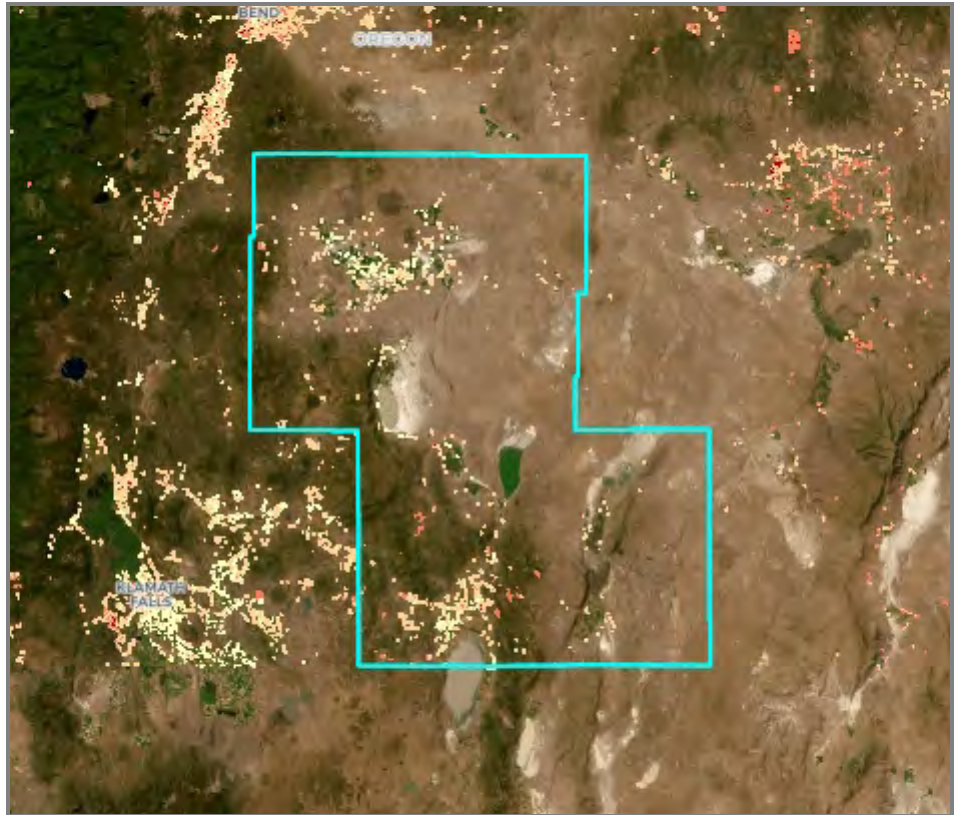
WILDFIRE RISK TO PEOPLE AND PROPERTY

Wildfire risk combines both the likelihood of a wildfire (or burn probability) and the expected effects of a wildfire on highly valued resources and assets. See the description of overall wildfire risk for more details.

Wildfire risk to people and property includes only housing unit density as mapped in the Where people live layer and US Forest Service private inholdings.

Note that these resources and assets were mapped at a broad scale across all of Oregon and Washington, and maps contain errors and omissions, especially at fine scales.

The values in the maps and charts reflect a range of negative impacts from low to very high. Positive benefits of wildfire are not mapped in this layer, assuming that any impacts of wildfire to human development is a negative impact.



Wildfire Risk to People and Property in Lake County

Category	Description	Acres	%*
Very High	Wildfire risk is very highly negative to people and property (top 5%).	244	< 1
High	Wildfire risk is highly negative (80-95th percentile).	5,511	< 1
Moderate	Wildfire risk is moderately negative (50-80 percentile).	33,451	< 1
Low	Wildfire risk is slightly negative (0-50 percentile).	8,650	< 1
No Data	There are no highly valued resources or assets mapped in the area, or it is considered non-burnable.	5,302,621	99

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

* Values may add up to over 100% due to rounding precision



Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)



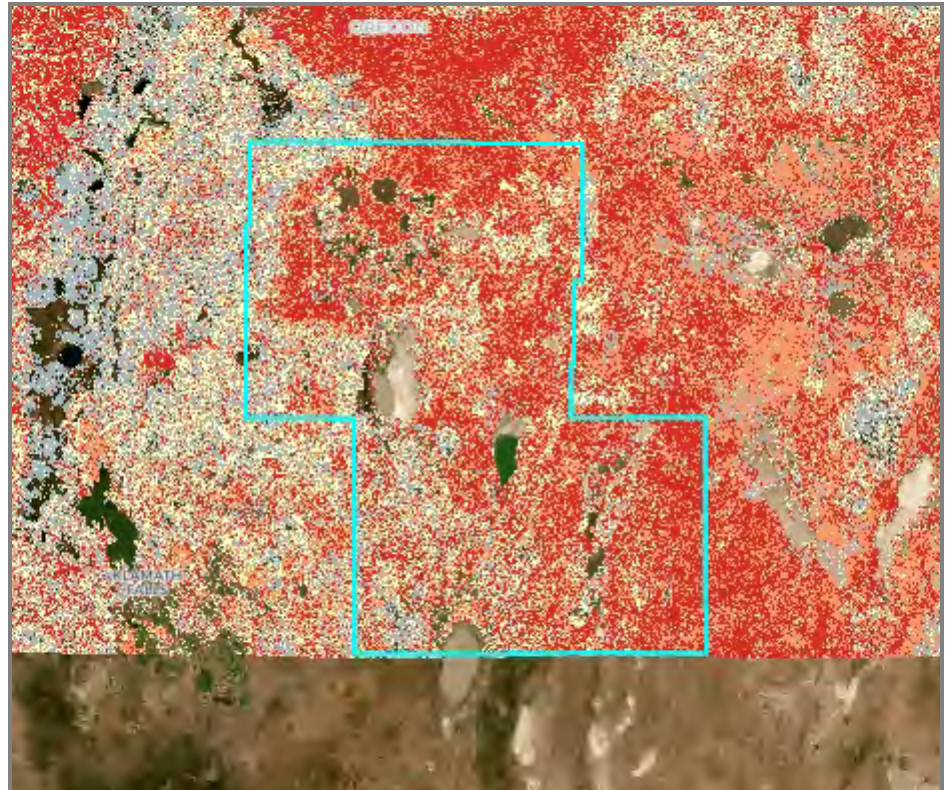
Generated: July 6, 2024

PROBABILITY OF EXCEEDING 4 FOOT FLAME LENGTHS

Flame length is an indication of fire intensity, which is a primary factor to consider for firefighter safety and for gauging potential impacts to values at risk. Fires with greater flame lengths are more intense and difficult to control. At higher flame lengths, firefighters cannot directly approach. As flame lengths increase, tree torching and spotting is expected and ember travel is increased.

Fires with greater than 4' flames are too intense for firefighters to work at the front of the flame using hand tools, and heavier equipment such as bulldozers may be necessary.

Using this layer to help target locations of higher flame length potential, a local assessment might reveal opportunity to reduce fire intensity as a goal of fuels treatment projects by using managed fire and/or other active management activities. Values are expressed as a percent likelihood. These probabilities do not take into account the likelihood of burning (see Burn probability).



Lake County probability of exceeding 4' flames

Category	Description	Acres	%*
75-100%	If a fire occurs, there is a very high (>75%) chance that flame lengths will be greater than 4'.	1,819,380	34
50-75%	If a fire occurs, there is a high (50-75%) chance that flame lengths will be greater than 4'.	1,491,167	28
25-50%	If a fire occurs, there is a moderate (25-50%) chance that flame lengths will be greater than 4'.	911,935	17
0-25%	If a fire occurs, there is a low (<25%) chance that flame lengths will be greater than 4'.	574,680	11
0%	This area contains non-burnable fuel types such as water, urban, agriculture, barren rock, etc.	553,317	10

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

* Values may add up to over 100% due to rounding precision



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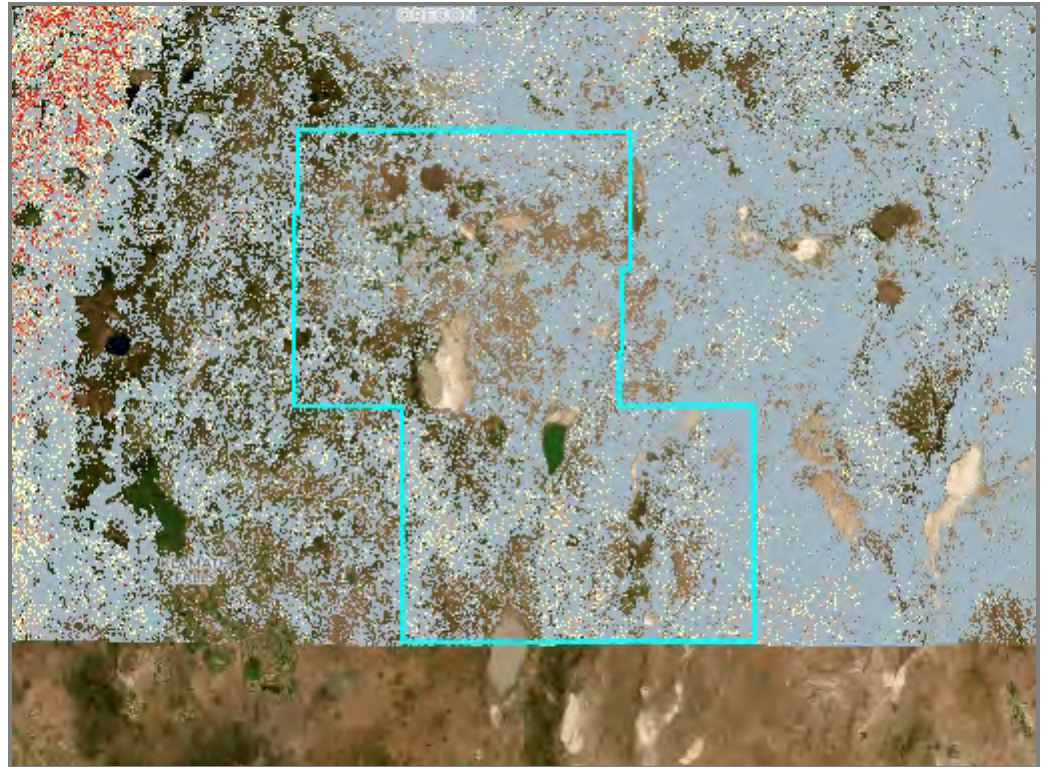
PROBABILITY OF EXCEEDING 8 FOOT FLAME LENGTHS

Flame length is an indication of fire intensity, which is a primary factor to consider for firefighter safety and for gauging potential impacts to values at risk. Fires with greater flame lengths are very intense and are expected to be highly difficult to control -- too intense for firefighters to work at the front of the flame, and they can severely impact values at risk. Tree torching and spotting is expected and ember travel is increased.

Fires with >8' flame lengths may be very difficult to control with little ability to work at the front of the flame, and greater risk of torching, crowning and spotting.

Using this layer to help target locations of higher flame length potential, a local assessment might reveal opportunity to reduce fire intensity as a goal of fuels treatment projects by using managed fire and/or other active management activities.

Values are expressed as a percent likelihood. These probabilities do not take into account the likelihood of an area burning.



Lake County probability of exceeding 8' flames

Category	Description	Acres	%*
75-100%	If a fire occurs, there is a very high (>75%) chance that flame lengths will be greater than 8'.	3,539	< 1
50-75%	If a fire occurs, there is a high (50-75%) chance that flame lengths will be greater than 8'.	59,273	1
25-50%	If a fire occurs, there is a moderate (25-50%) chance that flame lengths will be greater than 8'.	211,254	4
0-25%	If a fire occurs, there is a low (<25%) chance that flame lengths will be greater than 8'.	3,216,747	60
0%	This area contains non-burnable fuel types such as water, urban, agriculture, barren rock, glacial areas, etc.	1,859,664	35

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

* Values may add up to over 100% due to rounding precision



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Lake County

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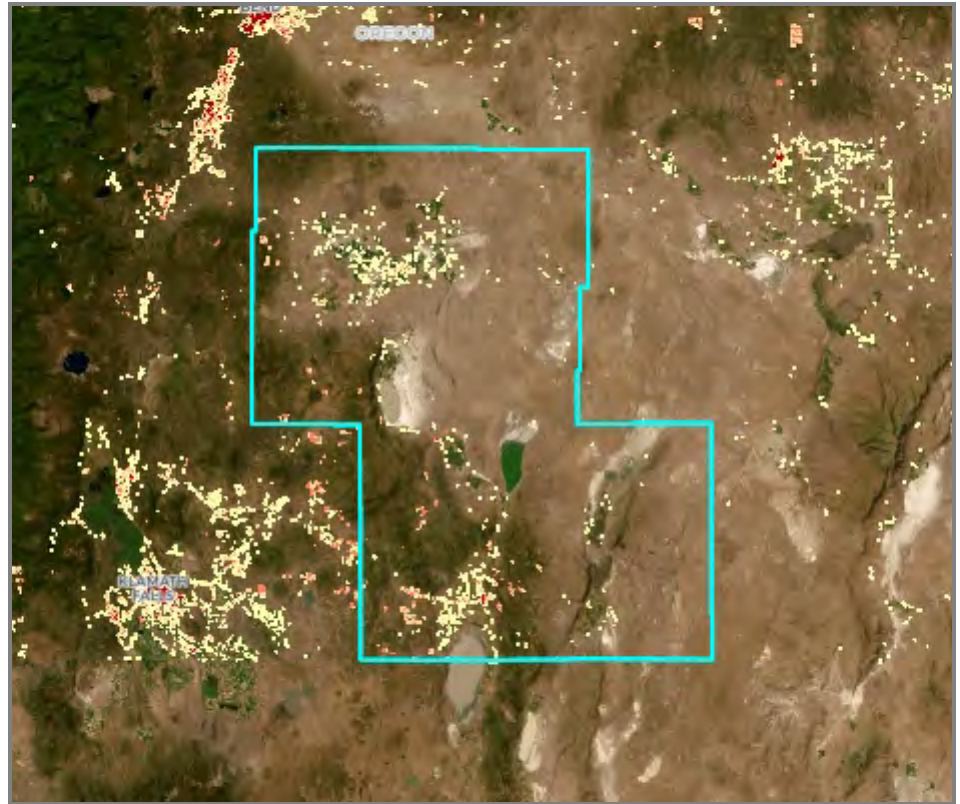
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POTENTIAL IMPACT TO PEOPLE AND PROPERTY

Potential impact to people and property represents the exposure or consequence of wildfire on mapped highly valued assets including housing unit density and USFS private inholdings.

The Potential Impact data layers characterize exposure and susceptibility only, and do not include the likelihood of an area burning. This differentiates the Potential Impact layers from Wildfire Risk layers, which account for the burn probability in the risk rating.

The data values reflect a range of impacts from very high to low negative consequences. Positive benefits of wildfire are not mapped in this layer, assuming that any impact of wildfire to human development is negative.



Lake County potential impact to people and property, if a wildfire were to occur.

Category	Description	Acres	%*
Very High	Potential impact is very highly negative to people and property (top 5%).	348	< 1
High	Potential impact is highly negative (80-95th percentile).	6,135	< 1
Moderate	Potential impact is moderately negative (50-80th percentile).	14,507	< 1
Low	Potential impact is slightly negative (0-50th percentile).	26,867	< 1
No Data	There is no people and property mapped in the area or it is considered non-burnable (urban, agriculture, barren, etc).	5,302,621	99

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

* Values may add up to over 100% due to rounding precision



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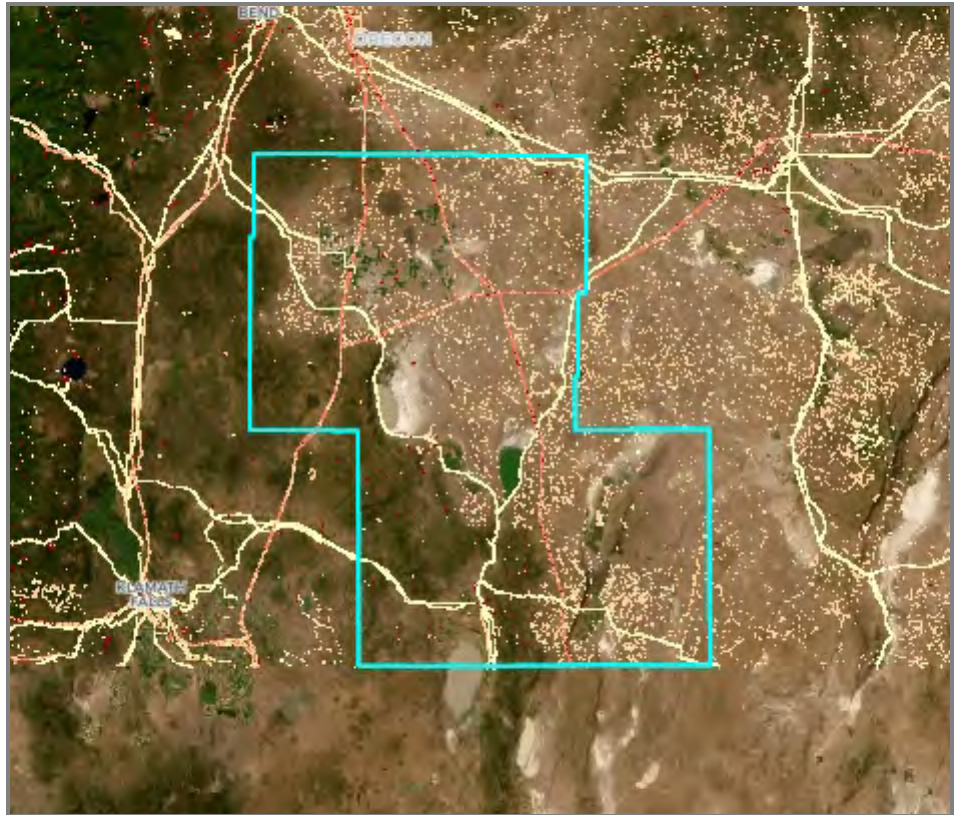
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POTENTIAL IMPACT TO INFRASTRUCTURE

Potential impact to infrastructure represents the exposure or consequence of wildfire on mapped highly valued assets including critical infrastructure, developed recreation, housing unit density, seed orchards, sawmills, and historic structures.

The Potential Impact data layers characterize exposure and susceptibility only, and do not include the likelihood of an area burning. This differentiates the Potential Impact layers from Wildfire Risk layers, which account for the burn probability in the risk rating.

The resulting values reflect a range of impacts from a very high to low negative consequences. Positive benefits of wildfire are not mapped in this layer, assuming that any impact of wildfire to infrastructure is negative.



Lake County potential impact to infrastructure, if a wildfire were to occur.

Category	Description	Acres	%*
Very High	Potential impact is very highly negative (top 5%).	2,178	< 1
High	Potential impact is highly negative (80-95th percentile).	17,090	< 1
Moderate	Potential impact is moderately negative (50-80th percentile).	19,250	< 1
Low	Potential impact is slightly negative (0-50th percentile).	29,632	< 1
No Data	There is no infrastructure mapped in the area or it is considered non-burnable (urban, agriculture, barren, etc).	5,282,328	99

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

* Values may add up to over 100% due to rounding precision



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POTENTIAL IMPACT TO WILDLIFE

Potential impact to wildlife represents the exposure or consequence of wildfire on mapped wildlife habitat for the following species: northern spotted owl, marbled murrelet, sage grouse, chinook salmon, coho salmon, steelhead trout, bull trout, redband trout, coastal cutthroat, and Lahontan cutthroat trout.

The Potential Impact data layers characterize exposure and susceptibility only, and do not include the likelihood of an area burning. This differentiates the Potential Impact layers from Wildfire Risk layers, which account for the burn probability in the risk rating.

The data values reflect a range of impacts from a very high negative consequences, where wildfire is detrimental (for example, sensitive habitat with fire-intolerant species), to a positive impacts of wildfire, where wildfire will produce an overall benefit (for example, improving wildlife habitat for fire-dependent species).



Lake County potential impact to wildlife habitat, if a wildfire were to occur.

Category	Description	Acres	%*
Very High	Potential impact is very highly negative (top 5%).	19	< 1
High	Potential impact is highly negative (80-95th percentile).	190,463	4
Moderate	Potential impact is moderately negative (50-80th percentile).	1,093,394	20
Low	Potential impact is slightly negative (17-50th percentile).	1,821,311	34
Low Benefit	Potential impact is slightly beneficial to wildlife at low flame lengths (8-17th percentile).	209,966	4
Benefit	Potential impact is beneficial, with a cumulative positive impact on wildlife habitat (0-8th percentile).	63,726	1
No Data	There is no wildlife habitat mapped in the area, or it is considered non-burnable (urban, agriculture, barren, etc).	1,971,598	37

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

* Values may add up to over 100% due to rounding precision



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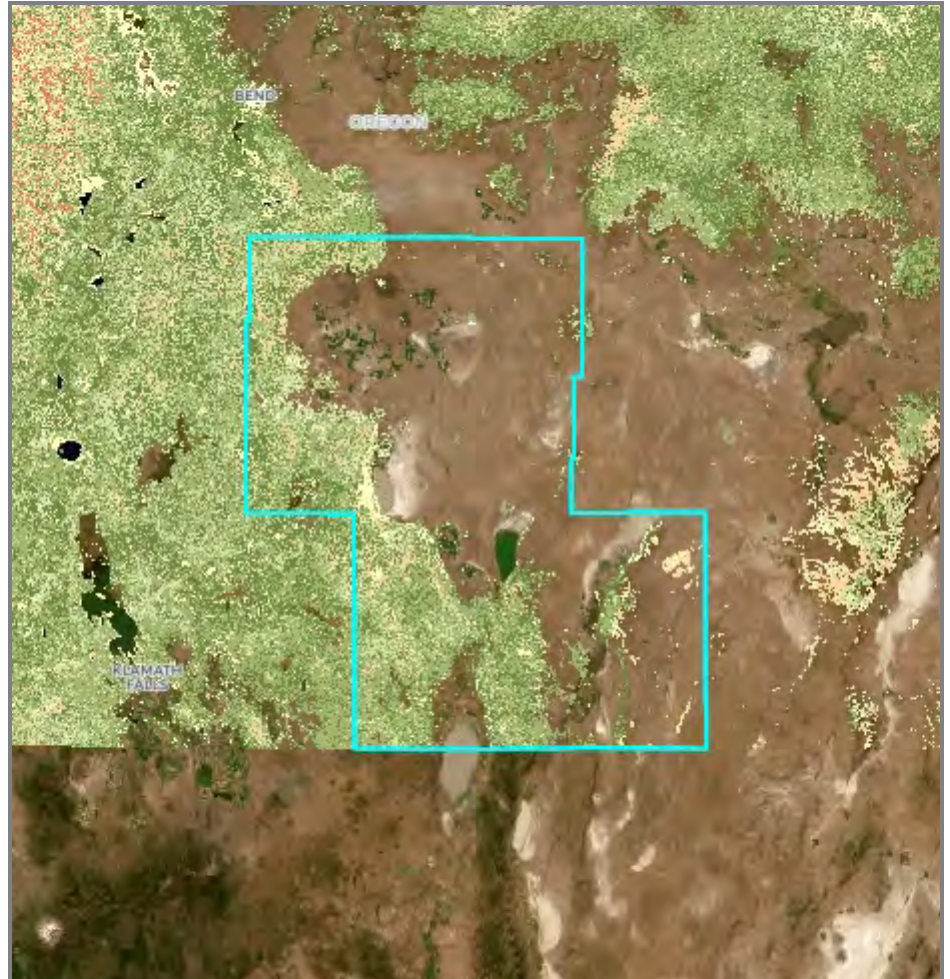
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POTENTIAL IMPACT TO FOREST VEGETATION

Potential impact to forest vegetation represents the exposure or consequence of wildfire on mapped forest vegetation. This layer provides information about departure of current vegetation condition relative to historical vegetation and reference conditions, and considers the natural role of fire to specific fire regime groups.

The Potential Impact data layers characterize exposure and susceptibility only, and do not include the likelihood of an area burning. This differentiates the Potential Impact layers from Wildfire Risk layers, which account for the burn probability in the risk rating.

The data values reflect a range of impacts from a very high negative rating, where wildfire will move the landscape further from historical or desired conditions, to positive, where wildfire will bring the landscape closer to historical or desired conditions. Note that wildfire impacts on rangeland and grassland vegetation were not simulated due to a lack of spatial data and adequate characterization of wildfire impacts on vegetation outside of forested communities.





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Lake County potential impact to forest vegetation, if a wildfire were to occur.

Category	Description	Acres	%*
Very High	Potential impact is very highly negative (top 3%). Fire has a highly detrimental effect on the landscape, moving the landscape further from historical/desired conditions.	295,802	6
High	Potential impact is highly negative (87-97th percentile). Fire has a detrimental effect on the landscape, moving the landscape further from historical/desired conditions.	629,914	12
Moderate	Potential impact is moderately negative (52-87th percentile). Fire will move the landscape further from historical/desired conditions.	249,331	5
Low	Potential impact is slightly negative (19-52th percentile). Fire will move the landscape further from historical/desired conditions.	69,937	1
Low Benefit	Potential impact is slightly beneficial to forest vegetation at low flame lengths, potentially producing a "fuel treatment" effect (0.6-19th percentile).	77,394	1
Benefit	Potential impact is beneficial, with a cumulative positive impact on forest vegetation (0-0.6th percentile). There is potential for fire to bring the landscape closer to	528	< 1
No Data	There is no vegetation mapped in the area, or it is considered non-burnable (urban, agriculture, barren, etc).	4,027,571	75

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

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FIRE REGIME GROUPS

A fire regime is a description of the general characteristics of a fire area, including frequency, intensity, size, pattern, season, and severity of effects of wildfire in an ecosystem over an extended period of time, dependent on topography, weather, vegetation, and fire history. How intensely a fire burns determines the effects and severity. Overall impacts of fires will depend on the historical fire regime and the influence of changes to that regime through changes in forest structure, composition, and processes.

Existing vegetation has departed from historical conditions in some areas, which affects the current fire environment. This departure depicts relative degrees of alterations of key ecosystem components such as species composition, structural stage, stand age, canopy closure, and fuel loadings. The potential impact to forest vegetation layer (and other potential impact layers) shows the areas where wildfire will move the landscape further from historical conditions, and where there are opportunities to use managed fire, active management, or other fuel treatments to bring the landscape closer to historical conditions.

Historically, higher fire frequency areas have lower fire severities. Vegetation in these areas is considered adaptive or resilient to fire due to this frequency. Examples include Ponderosa pine forests and dry mixed conifer forests. Lower frequency fire regime areas generally have higher severities, with vegetation and ecosystem elements usually considered sensitive due to their lack of exposure to fire. Examples include coastal forests, subalpine forests, alpine meadows, and many stream headwaters and riparian areas (see Existing vegetation).

Fire frequency suggests how often wildfire occurs (see Burn probability and Fire history data layers). Fire severity tells us how much impact wildfires are likely to have on the vegetation and other elements of an ecosystem (see Potential Impact data layers). The living and dead vegetation below forest canopies (shrubs, grasses, leaf litter, dead tree snags, etc.) also influences fire behavior (intensity and spread) and severity (impacts or effects). See Fuel models and Flame length data layers).

The national classification of fire regime groups commonly used includes five groups of fire frequency and severity pairs: I - frequent fire (0-35 years), low severity; II - frequent fire (0-35 years), stand replacement severity; III - 35-100+ years, mixed severity; IV - 35-100+ years, stand replacement severity; and V - 200+ years, stand replacement severity. Oregon has all of these historical fire regimes.

Maps of fire regime groups from LANDFIRE can be found here:

https://www.landfire.gov/geoareasmaps/2012/CONUS_FRG_c12.pdf.

Find more information about fire regime groups here: <https://www.landfire.gov/frg.php>.

Fire Regime table for major vegetation areas (in the Pacific Northwest):

https://www.fs.fed.us/database/feis/fire_regime_table/fire_regime_table.html#PacificNorthwest



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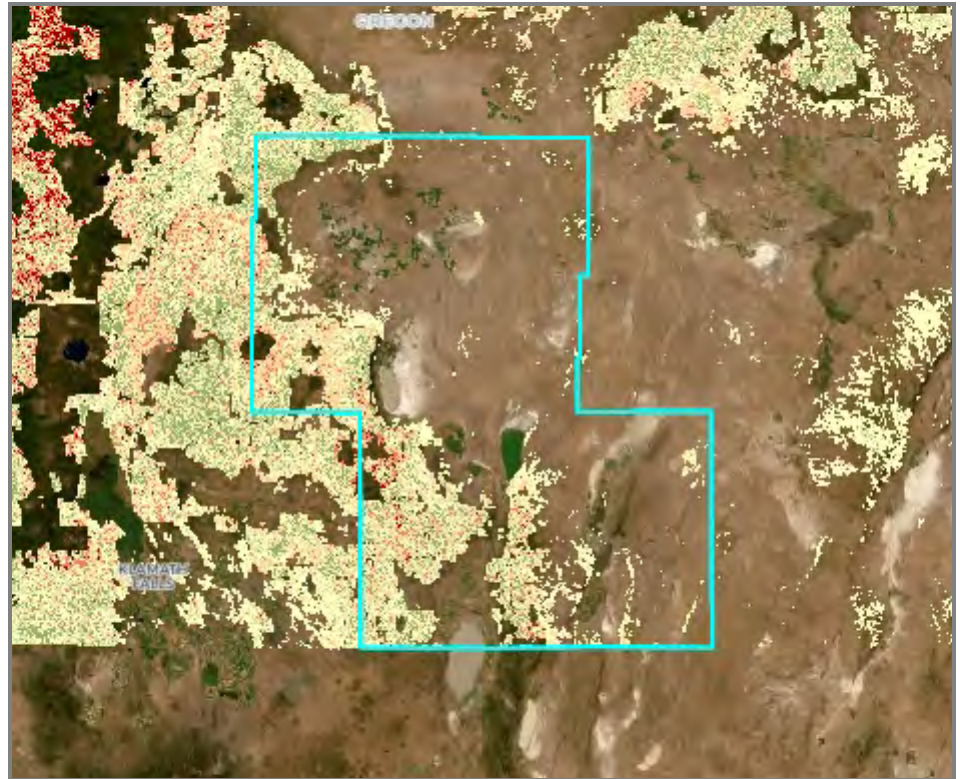
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POTENTIAL IMPACT TO TIMBER RESOURCES

Potential impact to timber resources represents the exposure or consequence of wildfire on mapped highly valued timber on US Forest Service, Tribal, private lands, BLM, and state-managed lands.

The Potential Impact data layers characterize exposure and susceptibility only, and do not include the likelihood of an area burning. This differentiates the potential impact layers from Wildfire Risk layers, which account for the burn probability in the risk rating.

The data values reflect a range of impacts from a very high negative rating, where wildfire is detrimental (for example early seral stage and/or sensitive forests), to positive, where wildfire may produce an overall benefit (for example, understory thinning treatment for fire-adapted species).



Lake County potential impact to timber resources, if a wildfire were to occur.

Category	Description	Acres	%*
Very High	Potential impact is very highly negative (top 5%).	7,072	< 1
High	Potential impact is highly negative (80-95th percentile).	60,923	1
Moderate	Potential impact is moderately negative (50-80th percentile).	214,284	4
Low	Potential impact is slightly negative (19-50th percentile).	279,867	5
Low Benefit	Potential impact is slightly beneficial to timber resources at low flame lengths (9-19th percentile).	94,326	2
Benefit	Potential impact is beneficial, with a cumulative positive impact on timber resources (0-9th percentile).	133,781	3
No Data	There are no timber resources mapped in the area, or it is considered non-burnable (urban, agriculture, barren, etc).	4,560,225	85

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

* Values may add up to over 100% due to rounding precision



Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)

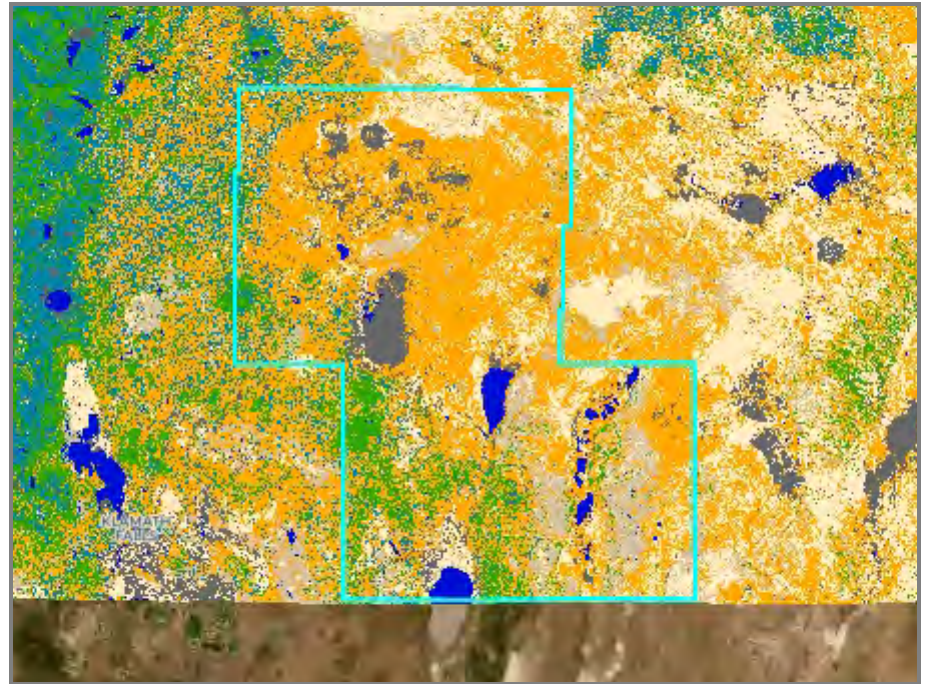


Generated: July 6, 2024

FUEL MODEL GROUPS

Fuel models describe the fire-carrying materials that make up surface fuels, such as grasses, shrubs and litter (see next page). Fuel models are developed from climate characteristics, existing vegetation type, cover, height, and other vegetation characteristics, and help us understand the fuels igniting and carrying fire. These fuel models can be grouped into broad categories of burnable fuels based on descriptions of live and dead vegetation that represent distinct fuel types, size classes, and load distributions (amounts), shown in the map and chart below.

Fuels and other elements of the fuelscape in the risk assessment were extensively reviewed and refined by local expert consultation, and the fuelscape was updated to account for wildfires that occurred through 2017.



Lake County fuel model groups (see next page for descriptions of codes)

Category	Description	Acres	%*
Grass	Fuel models 101-104, (GR1; GR2; GR3; GR4)	878,599	16
Grass/Shrub	Fuel models 121-123, (GS1; GS2; GS3)	2,789,043	52
Non-burnable-other	Fuel Models 91-93,99, (NB1; NB2; NB3; NB9)	370,659	7
Non-burnable-water	Fuel Models 98, (NB8)	128,828	2
Slash-blowdown	Fuel Models 202, (SB2)	< 1	< 1
Shrub	Fuel Models 141-147, (SH1; SH2; SH3; SH4; SH5; SH6; SH7)	577,606	11
Timber Litter	Fuel Models 181-189, (TL1; TL2; TL3; TL4; TL5; TL6; TL7; TL8; TL9)	206,578	4
Timber-Understory	Fuel Models 161-163, 165, (TU1; TU2; TU3; TU5)	399,165	7

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

* Values may add up to over 100% due to rounding precision



Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)



Generated: July 6, 2024

Table of Fuel Model Groups

40 Scott and Burgan Fire Behavior Fuel Models Description and Data Dictionary <https://www.landfire.gov/fbfm40.php>
<https://www.landfire.gov/DataDictionary/f40.pdf>

Group	Description
Grass Fuel models 101-104, (GR1; GR2; GR3; GR4)	GR1: Short, sparse dry climate grass is short, naturally or heavy grazing, predicted rate of fire spread and flame length low GR2: Low load, dry climate grass primarily grass with some small amounts of fine, dead fuel, any shrubs do not affect fire behavior GR3: Low load, very coarse, humid climate grass continuous, coarse humid climate grass, any shrubs do not affect fire behavior GR4: Moderate load, dry climate grass, continuous, dry climate grass, fuelbed depth about 2 feet
Grass/Shrub Fuel models 121-123, (GS1; GS2; GS3)	GS1: Low load, dry climate grass-shrub shrub about 1 foot high, grass load low, spread rate moderate and flame length low GS2: Moderate load, dry climate grass-shrub, shrubs are 1-3 feet high, grass load moderate, spread rate high, and flame length is moderate GS3: Moderate load, humid climate grass-shrub, moderate grass/shrub load, grass/shrub depth is less than 2 feet, spread rate is high and flame length is moderate
Non-Burnable-Other	Fuel Models 91-93, 99, (NB1; NB2; NB3; NB9) NB1: Urban NB2: Snow/Ice NB3: Agriculture NB9: Barren
Non-burnable-Water	Fuel Model 98, (NB8): Water
Slash-blowdown	Fuel Model 202, (SB2): Moderate load activity fuel or low load blowdown, 7-12 t/ac, 0-3 inch diameter class, depth about 1 foot, blowdown scattered with many still standing, spread rate and flame low
Shrub Group Fuel Models 141-147, (SH1; SH2; SH3; SH4; SH5; SH6; SH7)	SH1: Low load dry climate shrub, woody shrubs and shrub litter, fuelbed depth about 1 foot, may be some grass, spread rate and flame low SH2: Moderate load dry climate shrub, woody shrubs and shrub litter, fuelbed depth about 1 foot, no grass, spread rate and flame low SH3: Moderate load, humid climate shrub, woody shrubs and shrub litter, possible pine overstory, fuelbed depth 2-3 feet, spread rate and flame low SH4: Low load, humid climate timber shrub, woody shrubs and shrub litter, low to moderate load, possible pine overstory, fuelbed depth about 3 feet, spread rate high and flame moderate SH5: High load, humid climate grass-shrub combined, heavy load with depth greater than 2 feet, spread rate and flame very high SH6: Low load, humid climate shrub, woody shrubs and shrub litter, dense shrubs, little or no herbaceous fuel, depth about 2 feet, spread rate and flame high SH7: Very high load, dry climate shrub, woody shrubs and shrub litter, very heavy shrub load, depth 4-6 feet, spread rate somewhat lower than SH6 and flame very high



Oregon Wildfire Risk Explorer- Advanced Report

Lake County

5,350,506 Acres: (8,360 Sq. Miles)



Generated: July 6, 2024

Timber Litter Group	TL1: Low load compact conifer litter, compact forest litter, light to moderate load, 1-2 inches deep, may represent a recent burn, spread rate and flame low TL2: Low load broadleaf litter, broadleaf, hardwood litter, spread rate and flame low TL3: Moderate load conifer litter, moderate load conifer litter, light load of coarse fuels, spread rate and flame low TL4: Small downed logs moderate load of fine litter and coarse fuels, small diameter downed logs, spread rate and flame low TL5: High load conifer litter, light slash or dead fuel, spread rate and flame low TL6: Moderate load broadleaf litter, spread rate and flame moderate TL8: Large downed logs, heavy load forest litter, larger diameter downed logs, spread rate and flame low TL8: Long needle litter, moderate load long needle pine litter, may have small amounts of herbaceous fuel, spread rate moderate and flame low TL9: Very high load broadleaf litter, may be heavy needle drape, spread rate and flame moderate
Timber-Understory Group	TU1: Low load dry climate timber grass shrub, low load of grass and/or shrub with litter, spread rate and flame low TU2: Moderate load, humid climate timber-shrub, moderate litter load with some shrub, spread rate moderate and flame low TU3: Moderate load, humid climate timber grass shrub, moderate forest litter with some grass and shrub, spread rate high and flame moderate TU5: Very high load, dry climate shrub, heavy forest litter with shrub or small tree understory, spread rate and flame moderate
Fuel Models 181-189, (TL1; TL2; TL3; TL4; TL5; TL6; TL7; TL8; TL9)	
Fuel Models 161-163, 165, (TU1; TU2; TU3; TU5)	

This report was generated from the Advanced Oregon Wildfire Risk Explorer map viewer: tools.oregonexplorer.info/OE_HtmlViewer/index.html?viewer=wildfireplanning. For more information on wildfire risk in a specific location, you can generate a Homeowner's report from the Oregon Wildfire Risk Explorer map viewer.

How to Cite:

Accessed from the Oregon Wildfire Risk Explorer on July 06, 2024

URL: https://tools.oregonexplorer.info/OE_HtmlViewer/index.html?viewer=wildfireplanning

Primary data Source: USDA Forest Service Pacific Northwest Quantitative Wildfire Risk Assessment (2018)

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B

PODS/PCLS Documentation



Toward integrated fire management to promote ecosystem resilience

By Katherine Wollstein, Megan K. Creutzburg, Christopher Dunn, Dustin D. Johnson, Casey O'Connor, and Chad S. Boyd

On the Ground

- Management interventions for addressing invading annual grasses and encroaching conifers and their effects on fire dynamics in the sagebrush ecosystem are largely reactive.
- Reactive management limits tools for promoting long-term ecosystem resilience on a fire-prone landscape.
- We propose an integrated fire management approach in which all management activities before, during, and after wildfire are synergistic and improve long-term ecosystem response to fire.
- Harney County Wildfire Collaborative is adapting the Potential Operational Delineations (PODs) framework to improve fire outcomes and promote values at risk in the Stinkingwater Mountains pilot project area.
- The PODs framework serves to promote a broader geographic strategy for addressing the underlying causes of frequent and severe wildfires in the sagebrush ecosystem.

Keywords: cross-boundary collaboration, integrated fire management, landscape-scale, fire planning, wildland fire.

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Introduction

Threats to the resistance and resilience of the sagebrush ecosystem span multiple spatial and temporal scales and overlie a complex social-ecological landscape.¹ Conifer encroachment and non-native annual grasses interact with wildfire occurrence and severity and create positive feedback loops.^{2–4} Unfortunately, risk mitigation and management interventions generally react to conifer encroachment, annual grass

invasion, and wildfire events as isolated threats to ecosystem resilience—despite their mutual reinforcement.

Strategic management before, during, and after wildfire focused on improving ecosystem resilience is foundational to addressing disrupted fire regimes in the sagebrush ecosystem. Therefore, a fundamental change to rangeland management is needed; managing for improved fire outcomes must be the lens through which all activities are planned and implemented. We use the Harney County Wildfire Collaborative's (HCWC) adoption of Potential Operational Delineations (PODs) to discuss the utility of an integrated fire management approach to transition reactive rangeland management to proactive planning and management to promote rangeland values at risk before, during, and after wildfire.

Reactive management perpetuates ecosystem threats

Wildfire is integral to the sagebrush ecosystem,⁵ but fire exclusion over the last century has facilitated conifer encroachment and subsequent buildup of highly volatile fuels in novel areas.³ Additionally, invading non-native annual grasses contribute to more frequent and fast-spreading fires, and convert previously perennial-dominated plant communities to annual-dominated ones.^{6,7} Invasive annual grasses increase the probability of wildfires in a positive feedback loop.⁸ The long-term consequences of disrupted fire regimes in the sagebrush ecosystem have led to 1) frequent fires fueled by and that promote invasive annual grasses, and 2) high severity burns in novel plant communities where conifers have encroached.

Fire response and postfire restoration—predominant approaches to addressing these long-term consequences—are reactionary responses. These activities address immediate, urgent needs, but are not necessarily aligned with longer-term objectives such as ecosystem resilience.⁹ For example, during a fire event, fire response is largely focused on controlling and containing a fire. This is appropriate when a wildland fire threatens a site with low resilience to fire and low resistance to annual grass invasion. However, if sites that may benefit from burning were identified in advance (e.g., where conifers have encroached, as the effects of fire last longer than mechanical treatments)^{10,11} or if fuel treatments to reduce burn

severity had been implemented before the fire, incident responders could allow accordingly some fires to burn to promote long-term ecosystem benefits.

Underlying these biophysical processes, the sagebrush ecosystem is comprised of a network of private, federal, state, tribal, and other landownership types. Therefore, multiple actors are often involved in planning fuels treatments or completing rehabilitation projects, which can lead to difficulties coordinating management activities across jurisdictions (e.g., Epanchin-Niell et al., Davies et al., this issue).^{12,13} Furthermore, reactive management often relegates stakeholder input on social, economic, and ecological values to after the fire (e.g., during Emergency Stabilization and Rehabilitation procedures).

Today, this social-ecological system and the capacity of its plant communities to maintain and recover their fundamental composition and structure (see Boyd)¹⁴ is not aligned with current fire dynamics. Rather than simply treating invasive annual grasses and encroaching conifers, we must address the underlying causes of these interrelated threats to ecosystem resilience. This requires an integrated fire management approach in which all management activities implemented before, during, and after wildfire are synergistic and improve long-term ecosystem response to fire.

Toward integrated fire management: A framework

To improve fire outcomes and rangeland resilience, a proactive management approach is needed to accommodate the complex spatial-temporal, ecological, and social context of wildfire in the sagebrush ecosystem. This requires integrating fire and rangeland science, social values, and fire management technologies in the strategic selection of land management activities to produce long-term ecosystem benefits.¹⁵

Given these needs, the HCWC is adopting a PODs approach to 1) identify viable control lines where Incident Management teams can feasibly and safely respond to wildfires, 2) formulate a cohesive vegetation and fuels management strategy before fires occur within this network of control lines, and 3) strategically restore sites to enhance overall resilience to fire and resistance to invasion by annual grasses. These activities aim to limit the occurrence of large, severe wildfires, improve ecological, social, and economic outcomes of fires when they do occur, and promote rangeland values adversely affected by fire. We describe a PODs framework adapted to a rangeland context and the potential benefits derived from this integrated fire management approach.

Context: Harney County Wildfire Collaborative

The 2014 Buzzard Complex Fire burned nearly 162,000 ha (400,000 acres), including 40,500 ha (100,000 acres) in the Stinkingwater Mountains area of Harney County in southeast Oregon. After this, the HCWC was formed to prevent and prepare for severe wildfires and rehabilitate the land-

scape when they do occur. HCWC selected the Stinkingwater Mountains as a pilot project area centered on restoration and creating a more fire-resilient landscape. The project area encompasses >126,000 ha (312,000 acres) near the towns of Burns and Crane, Oregon, and includes a mix of private and Bureau of Land Management (BLM)-managed lands (Fig. 1). The landscape also includes a diverse range of ecological conditions including sagebrush (*Artemisia* spp.) and bunchgrass communities, areas where western juniper (*Juniperus occidentalis*) has encroached, and large areas impacted by wildfire are dominated by invasive annual grasses.

HCWC partners are diverse including fire professionals, state and federal agency resource managers, local government officials, the Burns-Paiute Tribe, ranchers, nonranching landowners, nongovernmental organizations, and the public concerned with resources such as wildlife, recreation access, and water quality. HCWC meets bimonthly and functions as a venue for organizing, knowledge-sharing, deciding, and legitimizing decisions and actions. Subcommittees are formed as needed to plan and execute specific initiatives, such as determining locations for fuel breaks for the Pueblo Mountain Pilot Project (see Wollstein et al.).¹⁶

Some of the HCWC's existing efforts in the Stinkingwater Mountains project area include working with the BLM and the Natural Resource Conservation Service to control invasive annual grasses (e.g., *Taeniatherum caput-medusae* [L.] Nevski and *Bromus tectorum* [L.]) and western juniper encroachment, increase perennial bunchgrass abundance, and create fuel breaks on federal and private lands. In the long term, HCWC seeks to support a landscape resilient to wildfire and provide for a diversity of values in the Stinkingwater Mountains area.

Adapting a PODs framework

PODs are polygons that spatially aggregate a landscape into meaningful units by integrating fire professionals' expertise on Potential Control Locations (PCLs) and other information such as wildfire risk and stakeholders' values associated with areas on the landscape.^{17,18} These tools are provided to Incident Management Teams to aid decision making, facilitating adoption and integration of local knowledge and expectations in wildfire response.¹⁹ Early development of the PODs framework was spearheaded by the USDA Forest Service with support from Colorado State University and Oregon State University. Over 45 National Forests in the western United States have created PODs across their forests and into adjacent ownerships,²⁰ coordinating with other land managers in a collaborative process. PODs have increasingly been applied in mixed ownership landscapes and beyond National Forests, including those with BLM and private landownerships.^{20,21}

PCLs define the boundaries of PODs and are derived from statistical analyses of features fire managers have successfully used in the past to contain fires,²² and integrating these with fire managers' experiential knowledge in collaborative venues.¹⁸ These locations must be accessible by

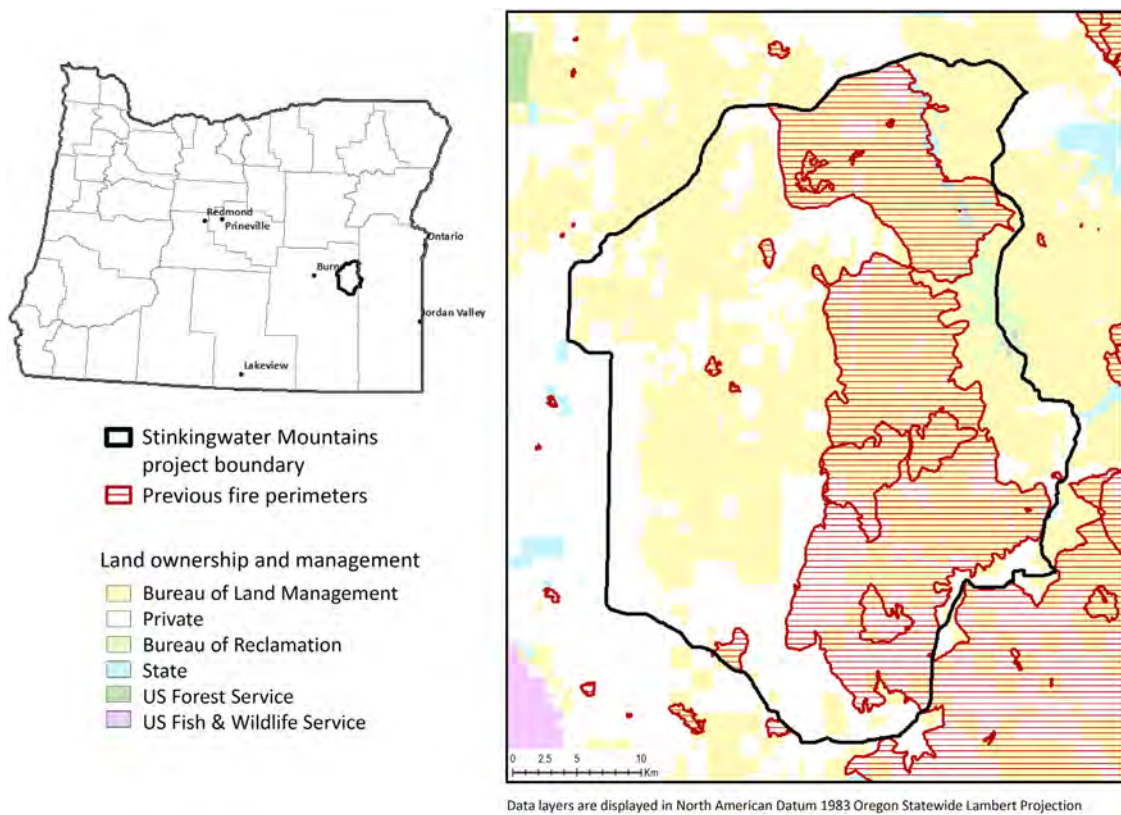


Figure 1. Harney County Wildfire Collaborative's pilot project area in the Stinkingwater Mountains, Oregon. The area is primarily managed by the Bureau of Land Management but includes many private landowners and other state and federal lands. A large portion of the landscape has been affected by fire in the last decade (fire perimeters from the SageCon Landscape Planning Tool).⁴⁶

incident responders and sufficiently devoid of fuels to safely deploy personnel and resources necessary to suppress a fire; in Harney County, such locations are typically existing roads (see Wollstein et al.).¹⁶ Other information such as the Suppression Difficulty Index (i.e., a quantitative rating of relative difficulty of performing suppression) can complement PCLs and identify areas where fire response will be safe and most effective.²³

A wildfire risk assessment is also integrated into the PODs framework, which includes burn probability, fire intensity, and for spatially explicit values the effects on values if an area were to burn.¹⁸ Together, these inputs summarize the outcomes of fire within the project area, inform priorities, and support management decisions.¹⁷ On a vast landscape where funding, capacity, and resources are limited, management decisions are strategically prioritized, and the wildfire risk assessment informs where to treat hazardous fuels to reduce wildfire risk and which areas to allocate suppression resources.²³

PODs applications and expected benefits

The PODs framework situates individual projects or Incident Management decisions within the context of a large landscape characterized by values, fire risk, and fire outcomes varying over space and time. In contrast to reactive fire management (i.e., “emergencies” such as incident response

or Emergency Stabilization and Rehabilitation procedures), PODs create an integrated venue for accommodating stakeholder input throughout all phases of fire management. PODs outputs inform management using local and expert knowledge, improve coordination across jurisdictions, and generate agreement regarding appropriate management activities to achieve the desired outcomes.^{18,25}

The diversity of landownerships and values on the landscape require a suite of actors to engage in proactive planning focused on strategic activities before, during, and after fires. Collectively, these activities address disrupted fire regimes and improve or maintain ecosystem resilience. There is general agreement within HCWC that PODs are needed to inform where and when to strategically treat fuels (i.e., encroaching conifers and invasive annual grasses) and “compartmentalize” wildfires to limit any negative long-term effects on resilience when they do occur (Fig. 2). Herein, we summarize potential future applications of PODs in the Stinkingwater Mountains pilot project area.

Before fire: Planning treatments, identifying desired fire outcomes

POD summaries can include information such as ecological site condition, resistance and resilience of current plant communities, risk of negative fire outcomes, and values such as greater sage grouse (*Centrocercus urophasianus*) habitat within

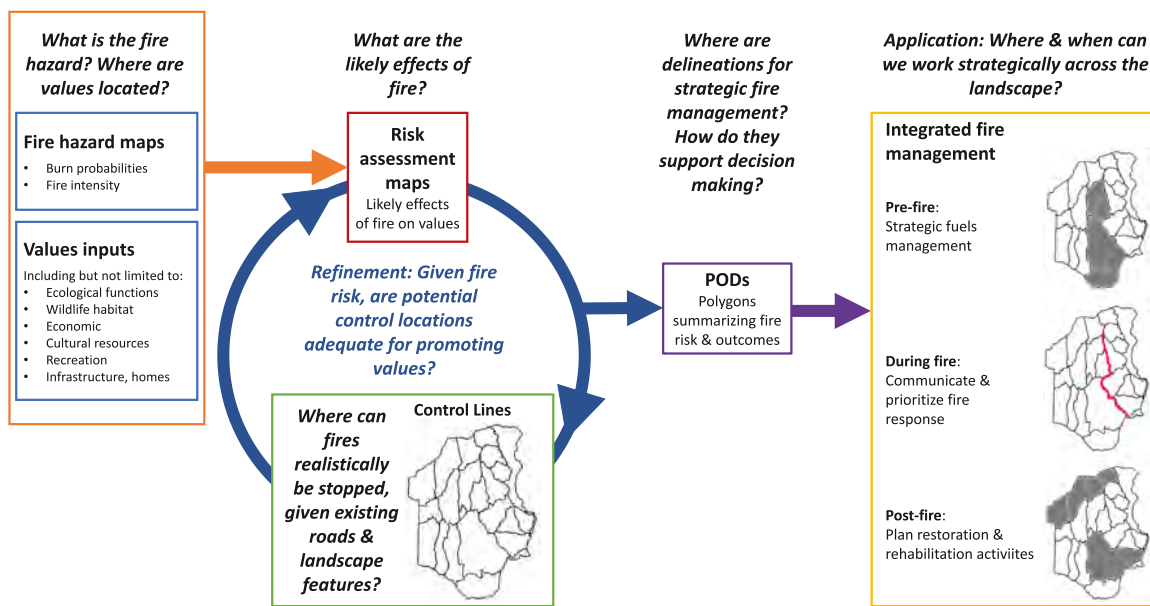


Figure 2. Adaptation of an integrated fire management approach using the Potential Operational Delineations (POD) framework by the Harney County Wildfire Collaborative for application in the Stinkingwater Mountains area of Oregon. Maps are representations used here for illustrative purposes only.

each POD. These compilations inform fire and resource specialists' and other stakeholders' discussions regarding relative risks or outcomes of wildfire and areas where proactive management (e.g., fuels treatments) may be most useful for mitigating fire risk or improving fire outcomes. This is especially useful for treatment prioritization (Fig. 3), given the high fire risk in the area and high cost of treatments relative to annual budgets.²³

Attributes associated with each POD help fire professionals and stakeholders identify, in advance, fire response priorities or where fire may be beneficial. For example, the Invasives Geographic Strategy maps developed for Oregon can identify “core” areas where proactive management keeps invasive annuals out, “transitioning” areas where risk of conversion to annuals exists, and “degraded” areas where current conditions and site potential indicate that restoration will be difficult (Fig. 3; Creutzburg et al.).²⁵ As a result, it may be determined that the PCLs constituting the POD boundary are a high priority for improvement or maintenance. For example, in the eastern part of the Stinkingwater Mountains project area, a high priority PCL may run along the western edge of PODs 11, 14, and 17 (Fig. 3). Areas to the east of these PCLs carry a high risk of complete conversion to invasive annual grass monocultures after fire, given the large areas intermixed between degraded conditions and areas likely “transitioning” toward annuals with low resilience and/or low perennial grass cover (Creutzburg et al.).²⁵

Preventing wildfire in such areas is critical to improving conditions and resilience over time; this unifying objective can inform all prefire management activities. Although PODs already dominated by invasive annual grasses (shown as degraded areas in Fig. 3) are identified as lower priority for rehabilitation, preventing the spread of

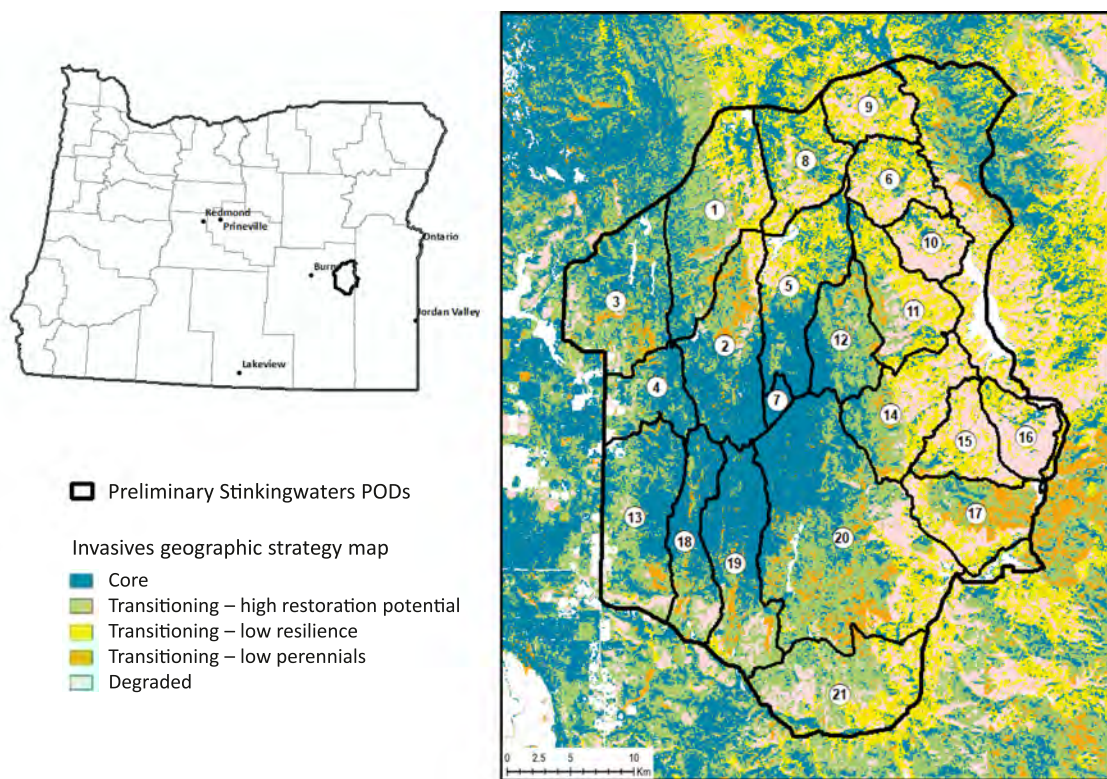
weeds into neighboring PODs with high-value sage grouse habitat or sites with low resilience and resistance is vital (Maestas et al.).²⁶

During fire: Fire operations, strategic incident response

Maps of POD boundaries are largely defined by PCLs and provide Incident Commanders or Management Teams a reference for where they can safely and strategically place equipment and personnel based on local best practices. Additionally, POD maps may be referenced by incoming Incident Management Teams who may be unfamiliar with the area and must communicate with the local unit.^{19,23,27}

A summary of values at risk (e.g., sage grouse habitat, cultural resources), hazards, and suppression resources within a given POD help line officers and fire managers make timely, strategic decisions such as where to hold a fire line or conduct burnout operations. This helps fire crews identify primary and contingency containment lines, which allows fire managers to streamline resource allocation and focus effort on PODs of paramount importance to preventing adverse outcomes affecting values at risk (e.g., transition to invasive annual grassland; see earlier section, ‘Before fire: Planning treatments, identifying desired fire outcomes’). Because the PODs framework is a planning tool aggregating spatial information on hazards and risk, PODs could also be useful to state and federal fire agencies using the Wildland Fire Decision Support System for providing rationale underlying tactical decisions and documenting decisions during wildland fire events.^{19,28}

Finally, by referencing the attributes of an individual POD and how an area was prioritized relative to other PODs, they



Data layers are displayed in North American Datum 1983 Oregon Statewide Lambert Projection

Figure 3. Preliminary Potential Operational Delineation (POD) boundaries in the Stinkingwater Mountains project area, Oregon based on existing control lines shown over the Invasives Geographic Strategy Map (Creutzburg et al.²⁵, this issue). The colors depict the level of annual grass invasion, from low in the “core” to intermediate in the “transitioning” areas and high in the “degraded” zones, to provide landscape context and facilitate discussion of shared management goals across this diverse landscape. Areas shown in white are nonrangeland cover types such as agriculture, developed areas, or water. PODs are numbered for clarity.

can aid fire managers’ communications with the public regarding objectives and fire management decisions during incidents.¹⁸

After fire: Communications, postfire rehabilitation objectives

Lastly, inventorying values and pre-fire condition of individual PODs can inform post-fire rehabilitation. For example, for a POD with both annual and perennial grass composition, an objective identified before a fire may be to attempt to transition those areas to perennial dominance after the site next burns (see Creutzburg et al. and Schroeder et al.).^{25,29} Because postfire rehabilitation objectives are agreed upon in advance, decisions and implementation (e.g., herbicide and seeding treatments) may be expedited.

Selection of sites for intensive restoration may be informed by how the rehabilitation of a POD influences fire behavior—when a fire occurs again—in context of the surrounding PODs. The POD framework informs rehabilitation priorities; intensive postfire treatments are costly and success is often low.^{12,30} Therefore, a prefire POD with a high likelihood of fire-based transition to invasive annual grasses would receive priority for postfire rehabilitation (i.e., to help prevent transition to annual grass dominance).

Anticipated implementation challenges

Given that, to our knowledge, the PODs framework has not previously been implemented in the sagebrush ecosystem where the BLM is the principal land manager, HCWC’s adoption of the framework is accompanied by challenges, some of which are unique to this social-ecological context. Some implementation challenges include 1) data limitations in rangeland settings; 2) treating fuels or improving PCLs in a multijurisdictional setting; 3) different priorities and perceptions of risk among project stakeholders; and 4) integrating values into the framework that are not spatially explicit and difficult to inventory in a sparsely populated working landscape. Below, we summarize each of these challenges.

First, available tools for modeling and mapping fire risk are often developed for forested systems where fire behavior is driven largely by weather and fuel moisture. In rangeland systems, high variability in fine fuel production drives wildfire,³¹ and invading annual grasses provide fine fuels difficult to capture in typical fuel models used in wildfire risk assessments.

Second, for PCLs to be functional for deploying resources and providing for firefighter safety, they cross multiple landownerships within the project area. Aside from securing private landowner permission and funding to create

or maintain PCLs crossing private land, there are also administrative requirements for PCL implementation or maintenance proposed on federal lands. Specifically, the National Environmental Policy Act requires federal agencies to analyze effects of any proposed management activities occurring on these lands; this can be time consuming, expensive, and strain limited staff capacity.³² As a result, the Burns BLM District in Oregon, where the Stinkingwater Mountains pilot project is located, estimates 90% of PCLs are currently not maintained nor do they adequately provide for firefighter safety without some level of fuel bed preparation during a wildfire incident.

The project area also involves diverse stakeholders and associated values; there can be misalignment in priorities as well as beliefs about management activities that will translate to landscape-scale wildfire risk reduction.^{32,33} Although the collaborative process to develop PODs has been documented to improve coordination among stakeholders (e.g., Greiner et al.)²⁴, if the purpose of PODs is not effectively communicated or if stakeholders disagree about approaches to wildfire management (e.g., Shinneman et al.),³⁴ some landowners or land managers within the project area may opt to not engage in planning or mitigation until they directly experience negative consequences (e.g., Epanchin-Neill et al., Johnson et al.).^{35,36} This undermines the purpose of an integrated fire management approach; if some landowners or managers are unwilling or unable to undertake activities identified through the PODs framework, it may be impossible to improve fire outcomes at the landscape scale.

Lastly, because of the relatively low population density, spatial extensiveness, and few structures, typical data inputs for values at risk into wildfire risk assessments (e.g., homes and infrastructure) do not capture those of paramount concern to rangeland stakeholders. In an informal inventory of values stakeholders associate with the Stinkingwater Mountains area at a 2021 HCWC meeting, some values identified by participants included sage grouse, livestock production, and roadless areas. These values can easily be integrated into PODs using existing data layers such as Oregon Department of Fish and Wildlife sage grouse habitat designations, state and federal grazing allotment boundaries, and Burns BLM Wilderness Study Areas. But it is more difficult to capture other values identified by participants such as watershed function, culture or heritage, natural beauty, community wellbeing, and providing for future generations. Although such values are difficult to quantify or are not spatially explicit, it is well documented that values such as culture or the future of a ranch operation—and, by extension, community wellbeing—motivates individuals to engage in rangeland conservation (e.g., Sorice et al., Wollstein and Davis).^{37,38} However, it is difficult to assess the outcomes of fire on these abstract values for integration into wildfire risk assessments. Furthermore, Tribal stakeholders may be reluctant to spatially map cultural resources (e.g., Welch, Lake).^{39,40} Yet an understanding of these will be essential for assessing the impacts of a proposed PCL, for example, that may involve digging a fire-line.⁴¹

Toward integrated fire management: A journey

HCWC recognizes a need for a fundamental management change within the sagebrush ecosystem; integrated fire management must become the lens through which all land management activities are planned and implemented. Primary threats to this landscape are non-native annual grass invasion as well as conifer encroachment—products of disrupted fire regimes. Therefore, management singularly focused on encroaching conifers or invading annual grasses is unlikely to produce durable outcomes. The PODs framework can work in service of a larger geographic strategy by organizing management activities on a vast landscape before, during, and after wildfires to reduce fire risk and adverse effects of fire on values.

An integrated fire management approach will focus planning and management efforts to yield improved fire outcomes. This approach includes developing a “spatially explicit program of work”⁴² that will aid in prioritizing wildfire risk mitigation treatments, such as location and timing of targeted grazing (Davies et al.).¹³ PCL implementation will be an ongoing and potentially controversial process (see Shinneman et al.)³⁴; an immediate need is an on-the-ground inventory of PCLs in the project area for accessibility and safety for wildland firefighting resources and tactics (e.g., fuel type, loading, and arrangement; see Wright et al.).⁴³ Additionally, to capture values in the Stinkingwater Mountains project area, a Landscape Values Mapping process will be undertaken (e.g., McLain et al.)⁴⁴ to integrate qualitative and/or spatially-ubiquitous values into a wildfire risk assessment.

Lastly, to engage in collective actions to promote long-term ecosystem resilience, there must be shared understanding across land ownerships and among stakeholders of wildfire risk, how individual actions contribute to—or mitigate—this risk, and the associated effects of fire on values.⁴⁵ The POD framework can support these needs. First, the PODs development process creates a shared vocabulary among stakeholders used to communicate about hazards, values, and risk.²⁴ Second, PODs integrate data and stakeholder values to credibly inform a prioritization process for actions to promote values at risk.¹⁸ Third, PODs implementation requires stakeholders to reach agreement regarding desired fire outcomes across a landscape and collectively identify activities to be implemented before, during, and after fire. Taken together, PODs are a useful tool for transitioning management of the sagebrush ecosystem toward integrated fire management and creating shared understanding about risk factors and coordinating management activities to improve fire outcomes.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships that may be considered as potential competing interests: The authors certify that they have no financial interest in the subject matter discussed in the manuscript. D.D.J. is a Guest Editor for this Special

Issue of Rangelands but was not involved in the review or decision process for this manuscript. The content of sponsored issues of *Rangelands* is handled with the same editorial independence and single-blind peer review as that of regular issues.

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Using Potential Operational Delineations (PODs) on Your Forest

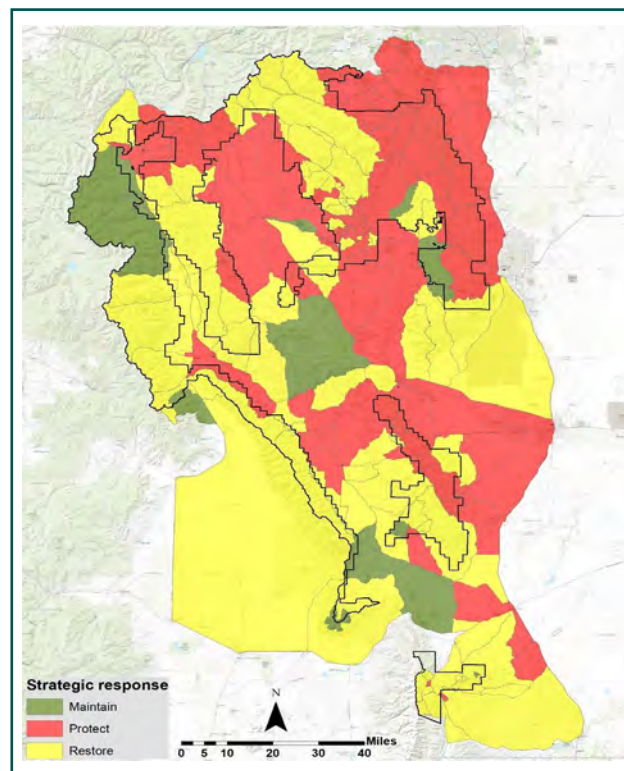
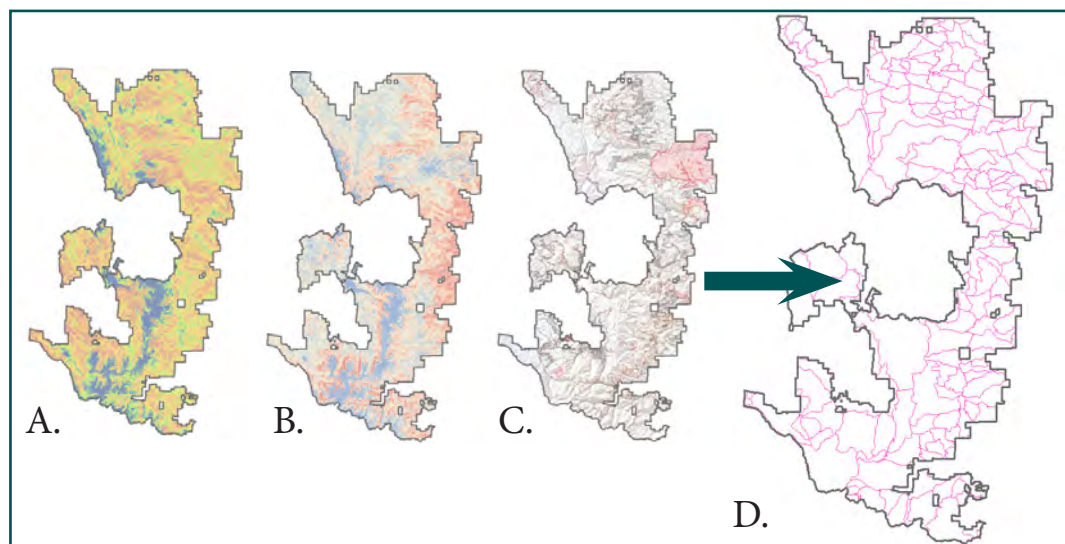
PODs is a science-based strategic planning tool already being used to make decisions around planning for and engaging with wildfires and on over 20 National Forests across the country. Using a combination of local, on-the-ground expertise and advanced spatial analysis, PODs identify the safest and most effective control lines that could be used to contain a wildfire. When combined with other risk assessment tools, PODs provides a framework that empowers science-informed decision making, improves communication and collaboration, and facilitates the integration of land and fire management objectives.

How PODs are Created and Used

POD boundaries are created during workshops by local firefighters with knowledge of a particular landscape, who work with analytical products that model fire behavior and suppression difficulty for the relevant landscape.

Workshop participants use maps with Suppression Difficulty Index (A), Potential Control Locations (B), and reference layers (C) to hand draw lines identifying effective control lines across the landscape. Hand drawn POD boundary lines are then digitized into an electronic format using Geographic Information Systems (D).

Once these boundaries have been defined, a larger group of stakeholders can then engage to identify values (e.g. homes, infrastructure, water resources, wildlife habitat) within them, and preplan potential responses to ignition within any given POD. PODs maps are useful tools for communicating land and fire management objectives with the public, within agencies, and have even been used across agencies during multiple fire incidents.



On the Pike and San Isabel National Forests, PODs are used in conjunction with the Colorado Wildfire Risk Assessment to identify strategic response zones. For example, in green/maintain zones, managers have determined that the values within the POD are at low risk from fire, and fire under the right conditions can be managed for resource benefits. In red/protect zones, fire should be suppressed and excluded where possible. In yellow/restore zones, values are at moderate risk from fire, and while fire under the right conditions could be managed for resource benefit, mechanical or prescribed fire treatments may be needed as a precursor to the reintroduction of fire.

Operationalizing PODs with the POD Atlas

The POD Atlas is a wildfire decision support tool that compliments and adds value to efforts to delineate PODs and parallel efforts related to wildfire risk assessments, mapping values at risk, and use of the Wildland Fire Decision Support System during wildfire incidents. The POD Atlas is designed to provide Forests with a standardized set of data across a region, while allowing for a degree of customization based on local needs. The POD Atlas includes information on fire ecology, fire behavior, wildland urban interface, watershed health, and control opportunities.



Colorado Forest Restoration Institute's Approach to PODs

Through continued consultation with land and fire management professionals, CFRI knows that while PODs are a helpful tool for visualizing landscapes and for strategic planning and communication, PODs and the spatial data they summarize need to be readily accessible to be effectively used on the ground. CFRI has streamlined our data analyses processes so the POD Atlas can be updated on an annual basis as conditions change, fires occur, fuel treatments are implemented, and new data becomes available.

Each POD Atlas contains:

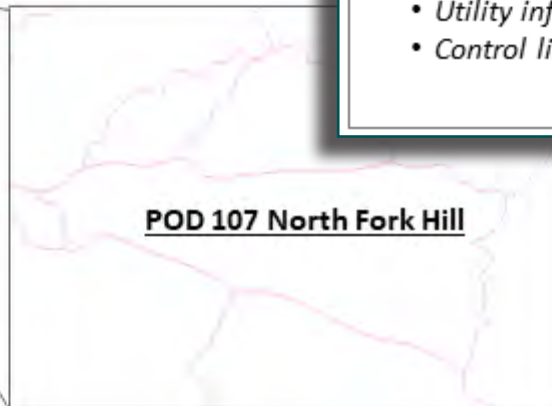
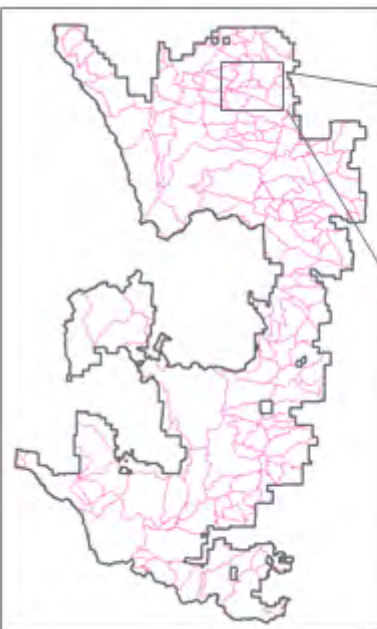
- PDF map books
- A geospatial database containing additional spatial data, POD delineations, strategic response zone delineations, standardized reference layers, and a POD network layer that summarizes population, ownership, fuels, fire behavior, recent disturbances, and values at risk
- POD locator map and georeferenced PDF maps of POD networks for use in the field
- Technical document and user guide



POD 107 North Fork Hill

POD Atlas: Attribute Summary

- Ecology
- Fire behavior
- Firefighter hazards
- WUI
- Land ownership
- Critical habitat
- Strategic response
- Utility infrastructure
- Control line characteristics



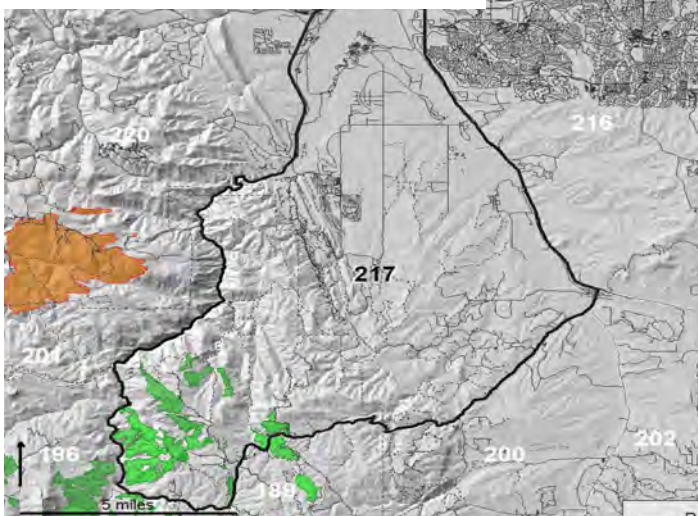
POD 107 North Fork Hill

POD Atlas PDF Map Books Summarize Values at Risk, Current and Desired Conditions, Land Management Objectives, and Fire Response Conditions in a Useable Format

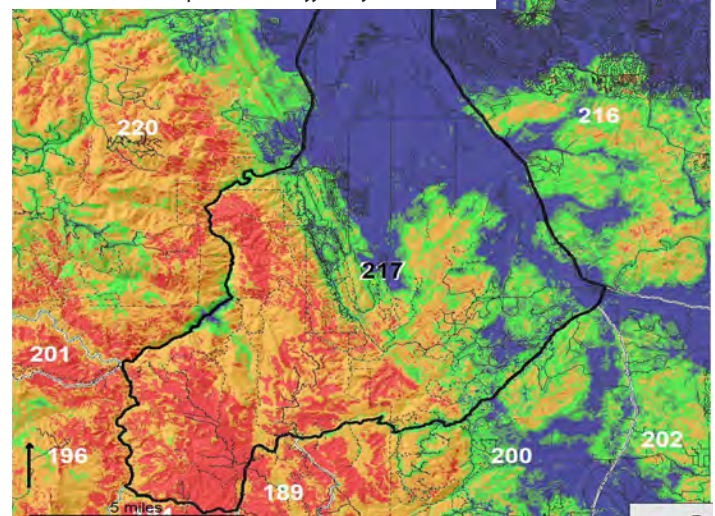
The POD Atlas provides the following information for each POD, complete with maps and imagery that summarize ecological information and fire response:

1. Base map with imagery and strategic response overview
2. Recent fires and fuel treatments
3. Vegetation type
4. Potential control locations
5. Suppression difficulty index
6. Potential flame lengths under different scenarios
7. Ownership and infrastructure
8. Heritage sites
9. Watershed and water utility infrastructure
10. Wildlife habitat
11. Expected conditional net value change for water and ecosystem function

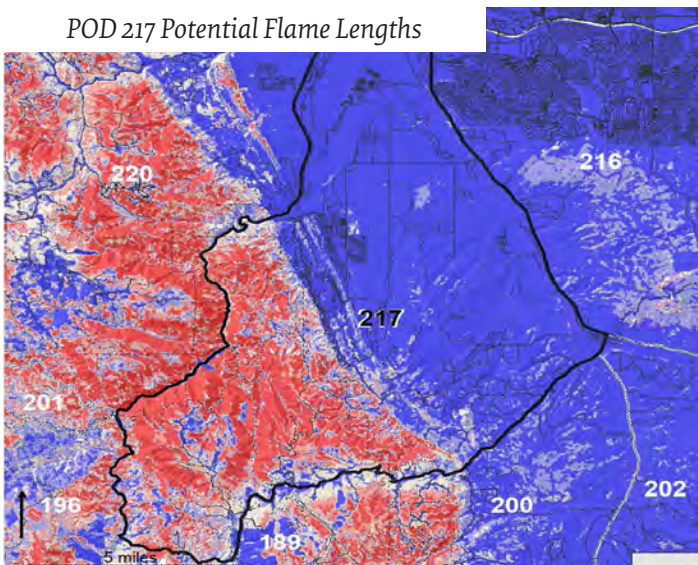
POD 217 Recent Fires and Fuel Treatments



POD 217 Suppression Difficulty Index



POD 217 Potential Flame Lengths



Further Reading and Resources:

[Collaborative Spatial Fire Management: Getting Ahead of Fire Using Potential Operational Delineations](#)

[Potential Operational Delineations and Northern New Mexico's 2019 Fire Season](#)

[Collaboratively Engaging Stakeholders to Develop Potential Operational Delineations](#)

[Application of Wildfire Risk Assessment Results to Wildfire Response Planning in the Southern Sierra Nevada, California, USA](#)

The POD Atlas is a result of a collaborative effort between Rocky Mountain Research Station, The Colorado Forest Restoration Institute and Prologix, a consulting firm specializing in wildfire modeling and risk assessments.



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**Legislation,
Policy & Programs**

LEGISLATION, POLICY, AND PROGRAMS

In 1985 a particularly severe national fire season resulted in 400 homes being burned in one day when fire protection resources were unable to keep up with the threat. In 1986 a cooperative agreement between the National Fire Protection Association (NFPA) and the USFS was formed along with the U.S. Department of the Interior (USDI) and the National Association of State Foresters (NASF) as partners. This agreement marked the beginning of a nationally heightened awareness of wildfire threats in the WUI and a series of legislation and policies.

Oregon Senate Bill - 360

The Oregon Forestland-Urban Interface Fire Protection Act of 1997 (SB-360) is the State of Oregon's response to several escalating wildland fire problems. Wildfires are burning homes in the interface and firefighters are working in increasingly hazardous situations. Fire suppression costs are increasing significantly in Oregon. Firefighting resources are limited and in some cases emergency service agencies cannot provide equipment and personnel to all structures threatened by a wildfire. SB-360 addresses these concerns and enlists the aid of the only people who can make fuel reduction changes to residential property: the landowners themselves.

The act applies to lands protected by the Oregon Department of Forestry and does not apply to other properties outside of ODF protection. Each county will establish a classification committee that will identify the hazard class of each area affected by the act. Once classified, landowners are provided a certification package and given two years to certify that their lands meet the standards. The Central Oregon District of the Oregon Department of Forestry will work closely with local emergency management personnel, conduct public meetings, hearings and community workshops along with providing onsite consultation for landowners affected by the act.

The Forestland-Urban Interface Fire Protection Act of 1997 is intended to be both voluntary and self-certifying by the homeowner. By design, the Oregon Department of Forestry developed a program that recruits the assistance of each homeowner, offers defensible space prescriptions and allows affected homeowners the option of certifying their property or not. The act contains no statutory provisions, homeowners will not be cited or required to appear in court if they choose not to participate. The act does contain a potential civil liability if the homeowner does not certify their property in two years after notification. If a fire originates on that property and spreads through the area that should be treated and the Oregon Department of Forestry must utilize extraordinary suppression efforts to contain that fire, a home owner could be liable for up to one hundred thousand dollars of suppression costs.

Oregon Senate Bill 762

Senate Bill 762 is comprehensive legislation passed in 2021 with bipartisan support. The bill authorized more than \$220 million to help Oregon modernize and improve wildfire preparedness through three key strategies: creating fire-adapted communities, developing safe and effective response, and increasing the resiliency of Oregon's landscapes. The Governor's Wildfire Council, the Legislature, and state agencies drove this legislation.

The legislation provides direction and investment to many state agencies. For the Board of Forestry and the Department of Forestry the bill, among other things, provides legislative direction regarding the wildland-urban interface; statewide fire risk mapping; prescribed fire; directed the Department to review and clarify the enforcement of rules pertaining to forestland; baseline standards for unprotected and under-protected lands in Oregon; and establishes grant programs to improve forest restoration and resiliency.

Emergency Conflagration Act

Under circumstances when wildfires create a serious threat to life and property, the Governor of Oregon may invoke the Emergency Conflagration Act. Once invoked, the Act authorizes the Governor to use the resources of any county, city, or district fire suppression organization to assist fire-fighting efforts anywhere in the state. The Act requires the state to reimburse the political subdivision for costs in providing such fire suppression assistance. The Governor can also declare a “state of emergency” authorizing the participation of all public agency personnel and equipment, including the Oregon National Guard, to assist in the battle against wildfires. During a Governor declared “state of emergency,” the Oregon State Police coordinates National Guard resources through the Office of Emergency Management and structural firefighting resources through the Office of the State Fire Marshal. The Oregon Military Department also provides both staff and equipment for emergency firefighting needs.

Under this law, only the Governor *may* invoke the Act to mobilize fire suppression resources from the across the state, but only if local resources, including what is available under mutual aid agreements, have first been fully committed. The increasing frequency of *Conflagration Act* utilization has caused funding concerns and challenges because no dedicated funds are set aside for this purpose. Especially troubling is the increasing frequency and public expectation to use the Act to protect structures in communities having minimal or nonexistent structural protection.

Federal Emergency Management Act (FEMA) Eligibility

Federal fire management financial assistance is provided through the President’s Disaster Relief Fund and made available by FEMA. Only fires involving structures or homes can be declared eligible for FEMA reimbursement. *Cost reimbursement can only occur if the Governor invokes the Emergency Conflagration Act and the Office of Emergency*

Management requests assistance and provides information on the estimated amount and severity of the threat to structures or homes through the FEMA Region 10 office. Each incident requires separate approval. After validating the nature and extent of the threat, the FEMA regional office requests approval by the FEMA director in Washington, D.C. Once approved, subsequent firefighting costs on all FEMA approved fires are eligible for approximately 70% cost reimbursement under an approved grant for managing, mitigating, and controlling designated fires during the incident time period as established by FEMA. Numerous fires in Oregon have received FEMA funds since the Grant County CWPP was updated in 2013.

Healthy Forest Restoration Act (HFRA)

The November 2003, Healthy Forest Restoration Act (HFRA) offers new tools and additional authorities for treating more acres in a timely fashion to meet forest restoration goals. It provides new authorities to treat fuels on federal land that require NEPA at the EA or EIS level. HFRA strengthens public participation by providing incentives for the local communities to develop their own community wildfire protection plans. It limits the complexities of Environmental Analyses for hazard reduction projects. It provides a more effective appeal process and instructs the Courts to balance short-term affects of implementing projects against the harm caused by delay and long-term benefits of a restored forest.

HFRA Title I addresses vegetation treatments on National Forest System and Bureau of Land Management lands that are at risk of wildland fire or insect and disease epidemics (emphasis is on Fire Regime I, II, and III in Condition Class 2 & 3). Title II encourages each community to develop their own CWPP and to designate their own specific WUIs where restoration projects might occur. Half of all fuel reduction projects under the HFRA must occur in the community protection zone as defined by HFRA. It also encourages biomass energy production through grants and assistance to local communities to help create market incentives for the removal of otherwise valueless forest material.

National Fire Plan (NFP)

Following the explosive fire season of 2000, the National Fire Plan was established to respond to severe wildland fires and their impacts to communities. It is an umbrella term that covers a variety of government programs and ideas addressing wildland fire issues. The NFP is a long-term investment that will help protect human lives, communities, and natural resources, while fostering cooperation and communication among federal, state, and local governments, tribes, and interested publics. Federal fire agencies worked closely with these partners, and the Western Governor's Association to complete a 10-Year Comprehensive Strategy in August 2001. An Implementation Plan was developed in May 2002 to provide consistent and standard direction for implementing the NFP and the

Strategy.

The NFP is focused on firefighting, rehabilitation, hazardous fuels reduction, community assistance, and accountability. The guiding principle for dealing with fire risks is the reduction of hazardous fuel loads threatening communities and wildland ecosystems. The NFP offers grant opportunities for hazard fuel reduction, wildfire planning, wildfire prevention, and fuel utilization. Most NFP funding in Oregon goes to wildfire preparedness and hazardous fuel treatment projects.

Oregon Statewide Land Use Planning Goals

Since 1973, Oregon has maintained a strong statewide program for land use planning. The foundation of that program is a set of nineteen statewide planning goals. The goals express the state's policies on land use and related topics. The program is administered through the Department of Land Conservation and Development (DLCD), and Oregon's cities and counties. Cities and counties implement the requirements of the statewide planning goals through state-approved local comprehensive land use programs. Planning goals related to WUI fire hazards are Goal 4 – Forest Lands, Goal 7 – Natural Hazards, and Goal 14 – Urbanization. Goal 4 requires local governments to minimize risks associated with wildfire when new dwellings or other structures are allowed in forestlands. Goal 7 requires local governments to develop programs to reduce risks to people and property from a variety of natural hazards, including wildfire. Goal 14 mandates that cities have urban growth boundaries (UGBs) to provide for urban uses and limit urban-type development on rural resource lands outside of UGBs.

FLAME Act – Federal Land Assistance, Management, and Enhancement Act of 2009

On October 29, 2009, the House and the Senate passed the Interior, Environment, and Related Agencies Appropriations Act, 2010, which included Title V – The FLAME Act of 2009. President Obama signed this bill into law on October 30, 2009. Many Congressional champions and organizations interested in solving the ongoing, and increasing, problems with wildfire suppression emergency costs have been pushing for the FLAME Act to be enacted.

The FLAME Act of 2009 establishes two FLAME Funds in the Department of Interior, Environment, and Related Agencies Appropriations Act of 2010; one for the Department of the Interior funded at \$61 million and one for the Forest Service funded at \$413 million in FY2010. The Funds address the impacts of increasing wildfire suppression costs and their effects on other agency programs. These funds are subject to normal appropriations for funding from year-to-year. The funding levels for FY2010 are not intended to represent a final method for calculating FLAME Fund budget requests in future years. Furthermore, agencies are expected to develop new methods for formulating fire suppression funding estimates for Wildland Fire Management (WFM) and the FLAME Funds. Furthermore, Congress stated that the use of “the 10-year rolling average has failed to keep pace with actual funding requirements and has led to significant

disruptions as agencies borrow from nonfire programs accounts when funds are exhausted” (p.72). In future years, the WFM and FLAME Fund accounts “**should fully anticipate wildland fire requirements and prevent future borrowing from non-fire programs**” (p.72, emphasis added). These two funds will reduce the need for agencies to transfer funds to wildfire suppression from other agency programs, which have historically led to considerable disruptions to important program functions. The Flame Act of 2009 retains the provision that requires the secretaries to notify Congress when 60 days of funds remain in the respective Flame funds. The funds can only be used after a secretarial declaration that a fire is large or complex or if annual suppression accounts are depleted. The conferees are expected to develop a streamlined declaration process to ensure funds are made available in the most efficient manner. Congress further expects the administration to keep their commitment to appropriately and fully estimate suppression costs, but not at the expense of other agency programs.

National Cohesive Wildland Fire Management Strategy

In response to requirements of the Federal Land Assistance, Management, and Enhancement (FLAME) Act of 2009, the Wildland Fire Leadership Council (WFLC) directed the development of the **National Cohesive Wildland Fire Management Strategy (Cohesive Strategy)**. The Cohesive Strategy is a collaborative process with active involvement of all levels of government and non-governmental organizations, as well as the public, to seek national, all-lands solutions to wildland fire management issues.

Oregon’s *Communities At Risk* Assessment

Oregon natural resource agencies, fire service professionals, and communities facing the threat of wildfires recognize the need for risk assessment. Many local communities and counties throughout Oregon have developed local risk assessments using a variety of methods. A statewide task force was formed in February 2004 as part of the Oregon Department of Forestry’s Fire Program Review to develop a statewide assessment of *Communities At Risk*. This supports fulfillment of the Memorandum of Understanding (MOU) between the National Association of State Foresters (NASF) and federal agencies as well as Task E in Goal 4 of the *Implementation Plan for the 10-Year Comprehensive Strategy*. The task force brought together a number of stakeholder organizations outside of those involved in the MOU. The statewide *Communities At Risk* assessment also provides guidance for communities in the process of developing or updating local risk assessments to align with the state methodology. The task force approved the methodology and initial statewide assessment. This assessment identifies communities and assigns each a *low, moderate, or high* risk rating for *Risk, Hazard, Protection Capability, Value, and Overall*. Because the definition of *community* within the federal legislation referenced above includes verbiage about populated areas “within or adjacent to federal lands”, this assessment also identifies those listed communities in proximity to federal or tribal lands. A local, collaborative review of the initial assessment followed during the winter of 2006, thus completing the final step in the assessment process. Local tax lot data was used from

25 counties to improve identifying the location of dwellings at risk in those areas; community (jurisdiction) names were updated; the fuel hazard rating was increased for certain agricultural vegetation classifications in eastern Oregon; and all related layers were updated to reflect the changes. Unlike the previous *Communities At Risk* list from the 2001 federal register, this risk assessment will be dynamic and maintained by the Oregon Department of Forestry. It will replace the listing in the federal register.

Fire Adapted Communities

The Fire Adapted Community uses tools, supported by federal and state agencies, to prepare its homes, neighborhoods, businesses, infrastructure, natural areas, and surrounding landscape for wildfire but it's up to you and your local jurisdiction to take the necessary actions. At a minimum, your community's fire adapted actions should include the following plans and programs.

A Community Wildfire Protection Plan is a collaborative plan created by the fire department, state and local forestry staff, land managers, community leaders, and the public. The planning process maps values at risk, including neighborhoods, infrastructure, and natural areas vulnerable to wildfire then takes action to reduce risk, such as prescribed burning, Firewise, or other measures that adapt a community to fire.

Firewise Communities USA provides steps for homeowners to take on their property to create defensible space, reduce wildfire threat to their homes and neighborhoods. Once the neighborhood has met specific criteria, they can apply for national Firewise recognition.

Ready, Set, Go! engages local fire departments who deliver the fire adapted communities message using Firewise, wildfire situational awareness, and safe evacuation planning and execution. The program educates both the public and fire departments in preparing a community for wildfire.

Firewise Communities USA

Brush, grass or forest fires don't have to be disasters. The National Fire Protection Association's (NFPA) Firewise Communities program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in the effort to protect people and property from wildfire risks.

The program is co-sponsored by the USDA Forest Service, the US Department of the Interior, and the National Association of State Foresters.

To save lives and property from wildfire, NFPA's Firewise Communities program teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses. We all have a role to play in protecting ourselves and each other from the risk of wildfire.

Good Neighbor Authority

Initially authorized by Congress with the 2014 Farm Bill, Good Neighbor Authority (GNA) allows the USDA Forest Service to enter into agreements with state forestry agencies to implement this critically important management work on national forests when the Forest Service is unable to do the work alone. Since 2014 32 states including Oregon have broken ground on more than 130 GNA projects. Through these GNA projects, states are contributing to the restoration of federal forests on a scale never before realized. As a result of GNA's success, Congress expanded Good Neighbor authorities to allow necessary road reconstruction and repairs ([with the FY 2018 appropriations omnibus](#)) and to empower tribes and counties to enter into GNA agreements ([with the 2018 Farm Bill](#)).

D

2011/2013

Proposed Projects Summaries

Lake County 2011 CWPP Projects

#	Affected Community	Mitigation Action	Description	Estimated Cost	Partners	In Progress or Completion Dates
Projects identified in the previous 2011 CWPP						
1	All	Public Education	Educate the public to the risks of wildfire to property and life		All	Individual agencies have made varying amounts of progress and have individual prevention programs. In the fall of 2023 a prevention subcommittee was created as part of the County's Emergency Preparedness Group.
2	All	Property Owner Education	Education property owners on reducing wildfire risk through the use of defensible space, home hardening and hazardous fuels reductions, such as prescribed fire.		All	All agencies have education programs in place to educate landowners on reducing wildfire risk. Multiple agencies have produced guidance on these topics for property owners. Multiple agencies have provided funding for hazardous fuels reduction (rx burns) on private lands and many projects have been completed through the use of grant funding.
3	All	Hazardous Fuel Management	The 2011 CWPP identified the risk of fire starts on public lands and moving onto private lands. This has come to fruition on multiple large fires over the last 5 years.		All	All agencies have completed thousands of acres of hazardous fuels treatments on both public and private

Lake County 2011 CWPP Projects

			<p>Watson Fire 2018, 59000 Acres Poker Fire 2019, 23000 Acres Brattain Fire 2020, 51000 Acres Bootleg fire 2021, 414000 acres Log Fire 2021, 16000 acres Fox Complex 2021, 10000 acres Cougar Peak Fire 2021, 92000 acres Morgan Fire 2023, 2300 acres</p>			<p>lands. Approximately --% of the total landscape has been affected either by planned treatments or wildfire. Much work remains to be done as well as maintenance on projects already completed. The overlap of wildfires in areas that had been treated for hazardous fuels showed much less damage and improved recovery rates versus untreated lands. Reference the RMA dashboard for a current map of completed fuels treatments.</p>
4	All	Water Sources	<p>The 2011 CWPP identified mapping and adding additional water sources and storage as a need to improve fire response within the County</p>		All	<p>Lakeview – A new well was developed approximately 8 miles north of Lakeview at the Leehman Station flowing approximately 250 gpm. The county funded extension of the municipal water system north of town approximately 1 mile.</p>
5	All	Access	<p>The 2011 CWPP identified access as problematic in many locations. The plan called for identifying access issues and working with landowners on improvement</p>		All	?

Lake County 2011 CWPP Projects

6	All	Emergency Response	<p>The 2011 CWPP made the following recommendations for improving emergency response within the County.</p> <ol style="list-style-type: none"> 1. Continue to strengthen cooperation between federal, state, and local agencies 2. Strengthen the capabilities of RFPD's (Rural Fire Protection Districts) through motivation, training, and improved equipment. Consider expanding the RFPD's to include areas not under protection. 3. Consider organizing RFPA's (Rangeland Fire Protection Associations) for unprotected lands. 4. Encourage the development of defensible spaces around homes and other important structures. 5. Encourage weed abatement along roadways, vacant lots, within communities and around homes. A member of the Lake County Weed Board should serve on the CWPP core team to coordinate fuels treatment with federal and state agencies. 6. Develop strategically located fuel breaks around all communities within the county as well as private timberlands. 7. Create and maintain additional water storage points in the private forested areas and rural areas outside of 	All	<ol style="list-style-type: none"> 1. The large fires within the area have seen a response from all agencies that has contributed to a more efficient working relationship by practice and identification of issues and addressing them in a variety of ways. All agencies participate in a variety of cooperative meeting pre and post season. More work is needed to work towards effectiveness. 2. A variety of programs are available to assist RFPD's and have been utilized to varying degrees. Capacity has been identified as one of the largest
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Lake County 2011 CWPP Projects

			<p>RFPD's. Identify possible existing irrigations system hookups and buried storage tanks.</p> <p>8. Continue the distribution of Firewise educational materials to promote knowledge and understanding in implementing activities that reduce wildfire risk.</p>			<p>obstacles to taking advantage of these programs in the fullest.</p> <p>3. The Warner Valley RFPA was organized in 2011 And covers Eastern Lake County. The High Desert RFPA was organized in 20?? And covers the majority of the Northern Part of the County. These organizations have grown dramatically since their inception and become in integral part of wildfire response within the county.</p> <p>4. Work completed has been at the individual property owner level. No wide spread programs have been implemented to date.</p> <p>5. The LCWMA (Lake County Weed</p>
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Lake County 2011 CWPP Projects

						<p>Management ?) has done??? Federal agencies have weed management programs to address weeds and have ????</p> <p>6. The USFS has implemented PODS (Potential Operational Delineation) lines on it's lands within the County to prioritize and implement fuel breaks in strategic areas. The BLM has identified priority areas and it's fuels program has funded treatments based on priorities.</p> <p>7. Unknown</p> <p>8. Fire wise material and information related has been periodically dispersed at various times and events.</p>
Specific Projects Identified in the 2011 CWPP						

Lake County 2011 CWPP Projects

7	Lakeview	Fuel Breaks	Establish a fuel break east of town along Deadman and Bullard Canyons.		Lakeview Fire, TCWS Fire, ODF, USFS	Lakeview Fire Department implemented prescribed burning in Bullard Canyon in the Spring of 2023. ODF completed fuels treatment in Bullard and Deadman Canyon's in 2022.
8	Lakeview	Defensible Space, Home Hardening	Defensible space and non-flammable roofs should be encouraged for all structures and houses on the east, south and north sides of Lakeview that are within 300 feet of juniper and sagebrush covered slopes. Fuels should be reduced and weed abatement should be completed.		Lakeview Fire, TCWS Fire, ODF, USFS	New building codes and improved permitting process have improved new construction, however many issues remain especially on the south and east parts of town.
9	Collins Timber Lands, ODF	Shaded Fuel Breaks, water storage and signage	Shaded fuel breaks should be constructed along its boundaries as appropriate to reduce the chance of fire spreading onto or from public lands. Consider installing 3000 gallon bladder storage in critical areas. Ponds suitable for dipping and drafting should be maintained. Construct signage at entry roads that convey fire danger and fire restrictions.		Collins Timber, ODF, Lakeview Fire, TCWS Fire, Paisley Fire	Some fuel breaks have been put in place. Water Storage? Signage? Rx progress?

Lake County 2011 CWPP Projects

			Consider Prescribed Burns to reduce ground fuels.			
10	Paisley	Fuel Breaks, Fuels reduction, weed management , Home hardening	Develop fuel breaks and defensible space on the west side of town. Cultivated lands should continue to be maintained. Dried grass and weeds within the community need to be mowed during the fall. The use of non-flammable roofs and defensible spaces should be encouraged. Reduce FRCC3 areas in the proximity of the town to FRCC 1		Paisley Fire, ODF, HDRFPA, USFS, BLM	Multiple fires in the Paisley area over the past five years have led to multiple fire lines being established south and west of town.
11	New Pine Creek	Fuel Breaks, Agriculture, Defensible Space, Home Hardening	Construct a series of three to four fuel breaks on the east and south sides of town. Reduce dry wheat fields by cultivating and watering. Eliminate wood piles next to structures and continuous fuels. Reduce sage brush, dried grass and weeds in town. Use of non-flammable roofs and defensible space should be encouraged for houses adjacent to the sagebrush covered slopes and embers from wildfires. Reduce FRCC 3 areas to FRCC 1		New Pine Creek Fire, Lakeview Fire, TCWS Fire, ODF, USFS, BLM	
12	Valley Falls	Defensible Space, Fuel Breaks, Structure Hardening	Sagebrush reduction and development of defensible space is needed on the west side of town. Continue to maintain cultivated lands around community. Mow dried grass and weeds within the community. Encourage the use of non-flammable roofs and defensible spaces. Reduce FRCC 3 areas to FRCC 1.		Valley Falls,, Paisley Fire, Lakeview Fire, HDRFPA, ODF, USFS, BLM	
13	Westside	Grazing, Mowing	Grass and weeds need to be mowed or grazed as they mature in the late summer within the community and surrounding area.		TCWS Fire, Lakeview Fire, New Pine Creek Fire, ODF, USFS	

Lake County 2011 CWPP Projects

14	All	Fire Protection Authority Communication and Coordination	Continue the cooperation and communication among LIFC, the RFPD's and private land owners concerning wildfire issues. Conduct yearly meetings and/or newspaper releases to inform the public of projects implemented in the last year and proposed action for the near future.		All	Cooperation among all agencies in the county continue to improve annually through cooperative exercises, meetings and incidents. Multiple large incidents over the last few seasons have identify areas of improvement for cooperation. Annual meetings related to wildfire preparedness or public notices have not been closely coordinated and are a potential area of improvement.
15	All	Community Firewise Outreach	Provide information on ways to reduce human-caused fires. Urge landowners to take action to construct defensible space. Encourage the use of non-flammable roofs and siding on new construction and remodeling. Increase the awareness of the natural role of fire in ecosystems and the need for hazardous fuel management.		All	Individual agencies have undertaken various prevention programs. They are not closely coordinated. Building codes have been adopted and enforcement has

Lake County 2011 CWPP Projects

			<p style="text-align: center;">Hold an annual “firewise clean up week” in association with the national fire prevention week.</p>			<p>become more consistent however there is still room for improvement.</p> <p>Multiple education programs related to good fire vs. bad fire and the role of prescribed burning are available to the public. This program may benefit from improved coordination.</p> <p>No annual clean up week has been established. Sporadic efforts have been undertaken in various communities. Ordinances related to landowner burning have been refined and air quality is still a primary issue.</p>
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Lake County 2011 CWPP Projects

16	All	Strengthen the Rural Fire Protection Districts	Efforts should be made to expand the RFPD's through public awareness, economic aid, appreciation, proper equipment and training. Provide basic training in wildland firefighting, fiscal management and wildfire preparedness. RFPD's should be responsible for firewise outreach in their respective areas. Improved communication among volunteer agencies with federal and state agencies is needed.		All	<p>Little expansion of RFPD's has occurred however the county has seen the creation of both the Warner Valley RFPA and High Desert RFPA that provide wildfire coverage for a majority of the private land within the county. Very little firewise outreach has been accomplished.</p> <p>Communications have improved dramatically between agencies but more work needs to be done. Radio equipment is being slowly upgraded, more funding is needed to upgrade rapidly.</p>
17	All	Protection of Homes and Structures	Develop defensible space around structures that is at least 30 feet wide. Use low combustible plant material for landscaping and remove wood piles next to structures. Use noncombustible construction material to		All	Current Oregon building codes require the use of non-combustible roofing materials.

Lake County 2011 CWPP Projects

			the extent possible. The minimum is non-combustible roofing.			Non-combustible exterior cladding products are used in most new construction and remodeling projects. More work is needed in strengthening and enforcement of building codes within the County.
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These are the projects I have identified within the 2011 CWPP. The 2011 plan alludes to other potential projects, however I believe they can be summed up within the boundaries of these projects listed.

E

2024

Proposed Projects Summary

#	Affected Community	Fire Authority	Description	Estimated Cost	Partners	In Progress or Completion Dates
Updated Project Tables for inclusion in 2024 CWPP						
1	Adel/Plush	Warner Valley RFPA	Construct dip pond on Little Crane Creek. Surface Eastside road, and other heavily used roads, to limit dust and improve access. Establish cell Tower in Plush.			
2	Alkali Lake					
3	Christmas Valley/Fort Rock					
4	Drews Reservoir/Drews Gap/Quartz Mountain					
5	Thomas Creek-Westside RFPD	Thomas Creek	Water Storage Sites at the 2 current TCWS Fire Stations or where the Five Corners Station is relocated(if so) and three additional water storage facilities as stations are build at the Airport, Drews Reservoir (After Annexation if approved) and Drews Gap/Antelope Canyon Station (Once approved and Drews Gap Annexed). These			

			<p>projects should be started in the next 2 years and may extended out 5-10 years. I think we vaguely mention some water storage but not sure how detailed.</p> <p>☒ As alluded to above, relocate the Five Corners Fire Station as there is no room for expansion and we are built on the property lines, relocated to the east or north. And then build a new Westside Station to the southeast of the current station with pull through bays. And then build three additional stations: Airport, Drews Reservoir, and Drews Gap/Antelope Canyon.</p> <p>☒ The third is just further fuel reduction around Drews Reservoir and Lower Cottonwood Road and along the fire district boundary on westside.</p>			
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Lake County CWPP Projects

#	Affected Community	Mitigation Action	Description	Estimated Cost	Partners	In Progress or Completion Dates
New Projects for inclusion in 2024 CWPP						
1	Lakeview, Westside, Drews Creek, Valley Falls, Paisley	Forest Health	LCUWC applied for a Lake County All Lands Restoration Initiative Focused Investment Partnership to work on forest health thinning, juniper reduction and prescribed fire.	12 million	LCUWC, USFS, BLM, ODF, NRCS, Collins Pine, Private LOs, Grayback, LCCWMA, others?	Grant award will be announced in April 2024, if awarded implementation would proceed through June 2030.
2	Summer Lake	Juniper Reduction	LCUWC applied for a BLM Summer Lake All Lands Restoration and Fuels Reduction grant to reduce junipers with in the Summer Lake All Lands Project area	\$300k	LCUWC, BLM, ODF, Private LOs	Grant award announcement will be made in June 2024?
3	Lakeview, New Pine Creek, Adel	Forest Health Mapping and Inventory	LCUWC has a South Warners Forest Health Mapping and Inventory Technical Assistance grant	\$50k	LCUWC, LCRI, USFS, Private LOs	Grant is in progress
4	All	Prescribed Fire	LCUWC completed a Lake County All Lands Restoration Initiative Prescribed Fire Planning Technical Assistance grant	\$50k	LCUWC, USFS, BLM, ODF, Collins Pine, Grayback, Private Los, LCCWMA, others?	Grant recently completed, landowner burn plans created and landowner checklist created to help navigate the necessary steps to conduct Prescribed burning on private property.
5	Cottonwood Rd	Prescribed Fire	LCUWC received a USFS RAC grant to implement prescribed fire	\$191k	LCUWC, USFS, BLM, ODF,	Prescribed fire will occur in fall 2024.

Lake County CWPP Projects

					Collins Pine, Grayback, Private LOs others?	
6	Goose Lake Basin	Habitat Improvement	LCUWC received an Oregon Department of Fish and Wildlife Mule Deer Enhancement grant.	\$300k	LCUWC, ODFW, ODF, Private LOs	Allocating funding now, implementation will commence spring of 2024.
7	Summer Lake	Slash Management	LCUWC applied for an OWEB grant to deal with the slash piles of previous thinning projects.	\$250k	LCUWC, USFS, BLM, ODF, HDRPA, Grayback, Private Los, LCCWMA, others?	Grant award will be announced in April 2024, if awarded implementation would proceed through June 2027.
8	All	Post-Fire Recovery	LCUWC received a Cougar Peak and Patton Meadow Post Fire Recovery grant	\$2.5 mill	LCUWC, ODF, Private Los, Collins Pine, CWMA,	Grant is in progress and addresses uplands and stream and riparian restoration. Closed June 2025.
9	All	Slash Treatment	There is a need to help landowners with slash treatment, either by pile burning assistance, biomass utilization, or other options. Please be sure to build this into the new CWPP update.			
10	All	Prescribed Fire	There is a need to change the culture of fire (not all fire is bad). Need more education and outreach concerning Prescribed fire. The LCUWC is interested in helping identify classes and/or supporting the ODF CBMT certification courses. Ultimately, we would			

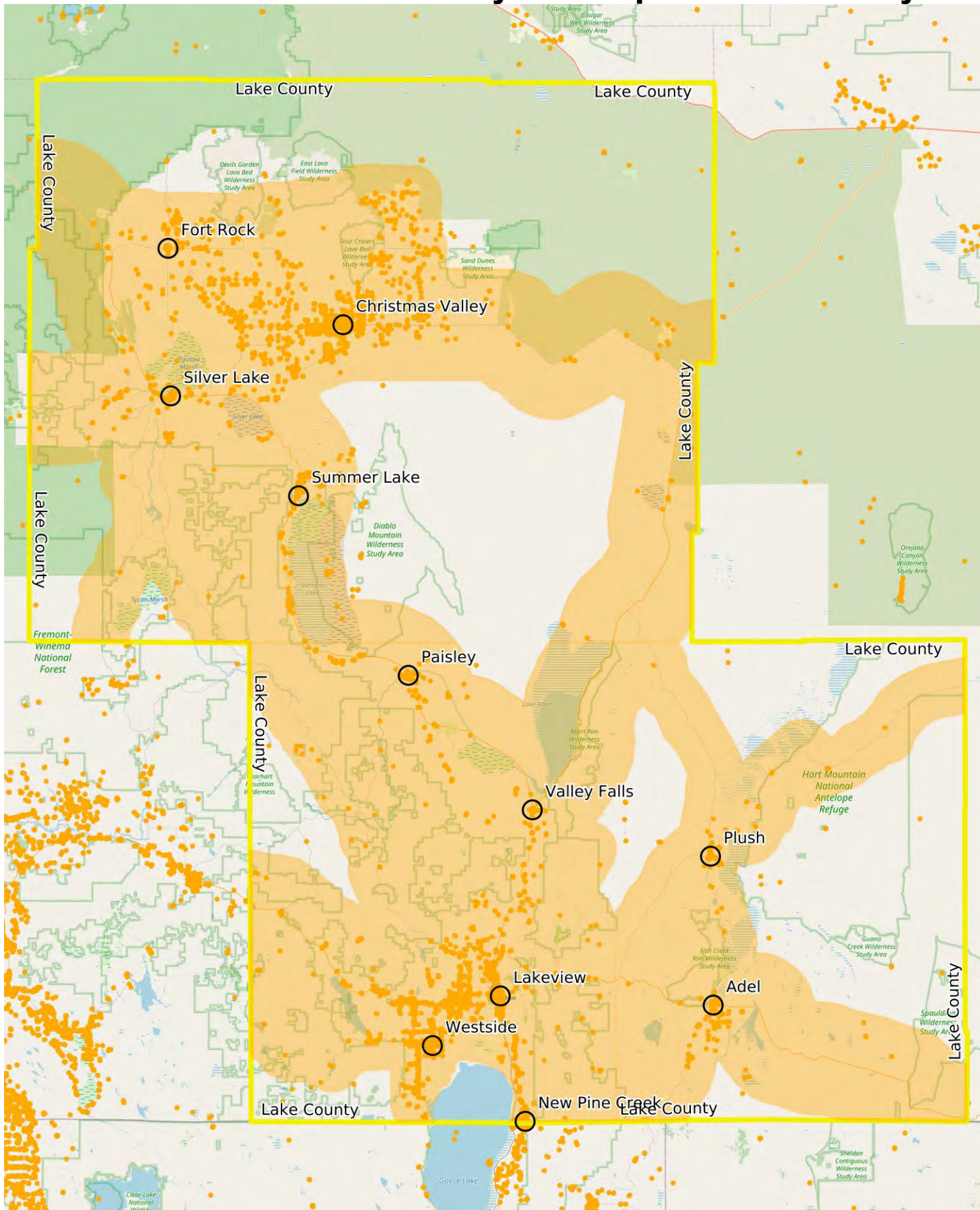
Lake County CWPP Projects

			love to see a Prescribed Burn Association (or two) develop in our county.			
11	All	Fuel Breaks	There is a need for more fuel breaks in strategic places around the county, but these MUST be maintained to reduce spread of IAGs			
12	All	Herbicide	There should be some language in the new CWPP update that allows for wide spread use of the most effective herbicide applications. Rejuvra is showing much promise for IAGs but currently the feds cannot use this.			

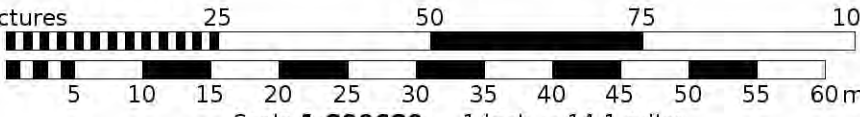
F

Maps

Lake County Base Map and WUI Boundary

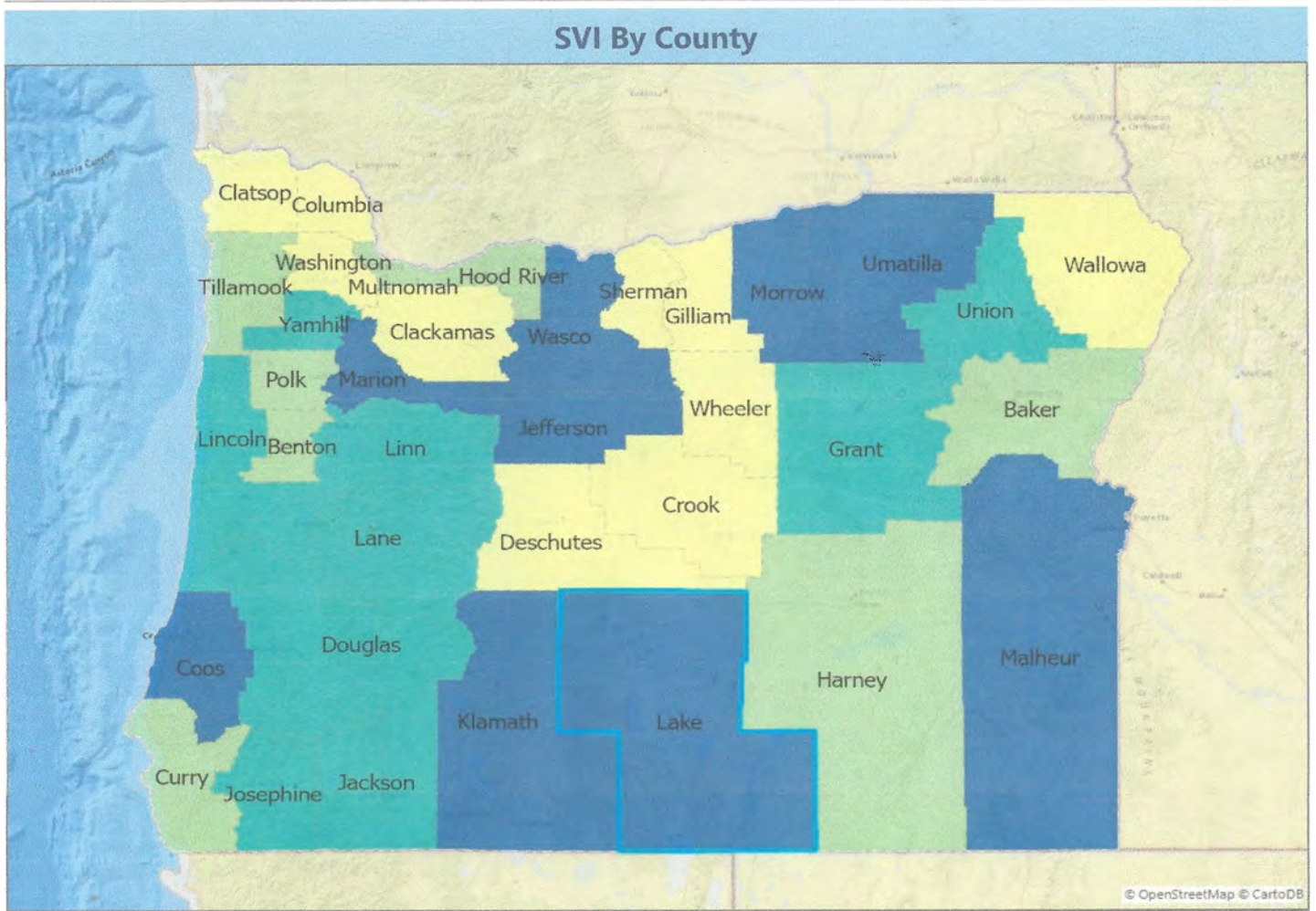


Communities and Structures
 WGS84
 UTM Zones 10T-11T
 Scale 1:890680 1 inch = 14.1 miles





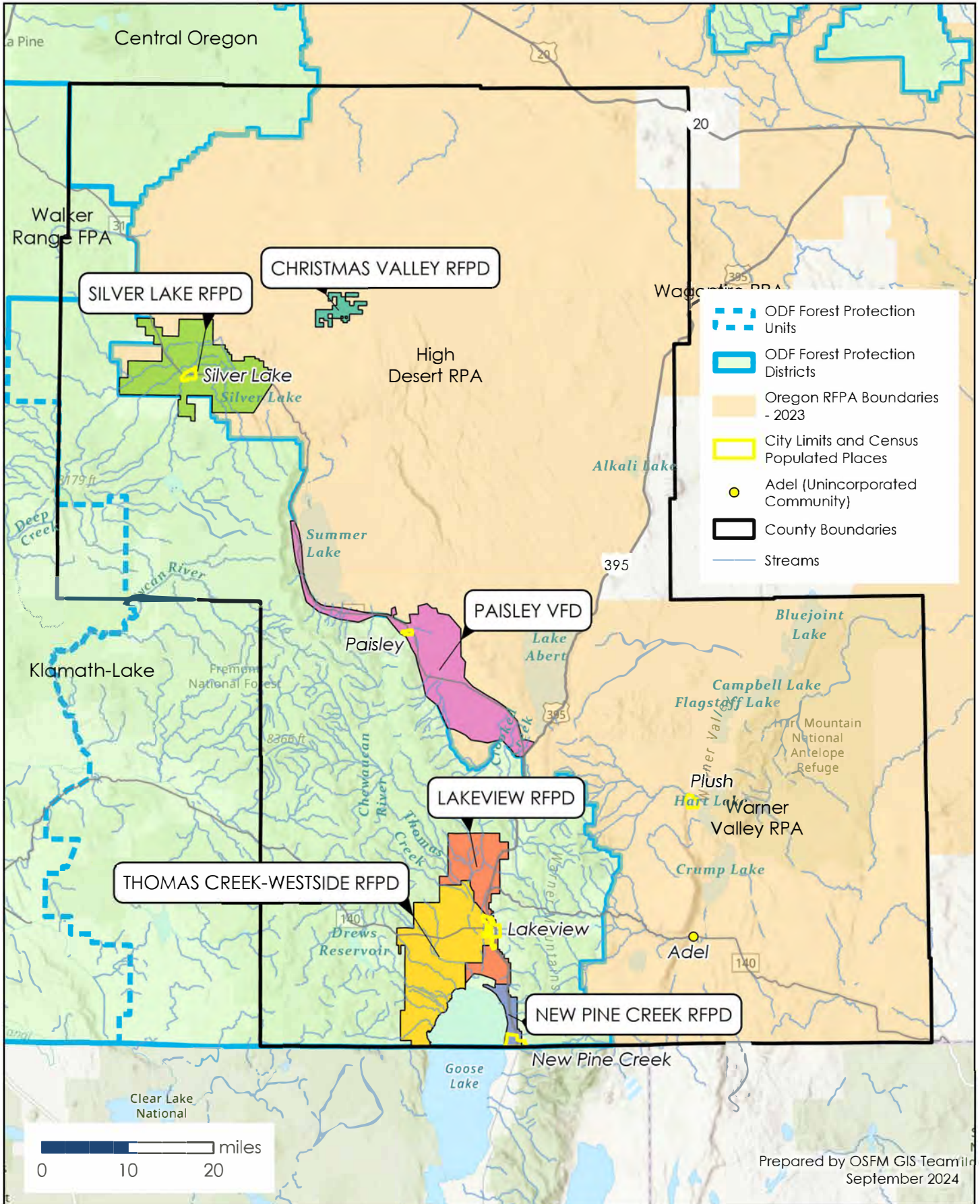
Social Vulnerability Report



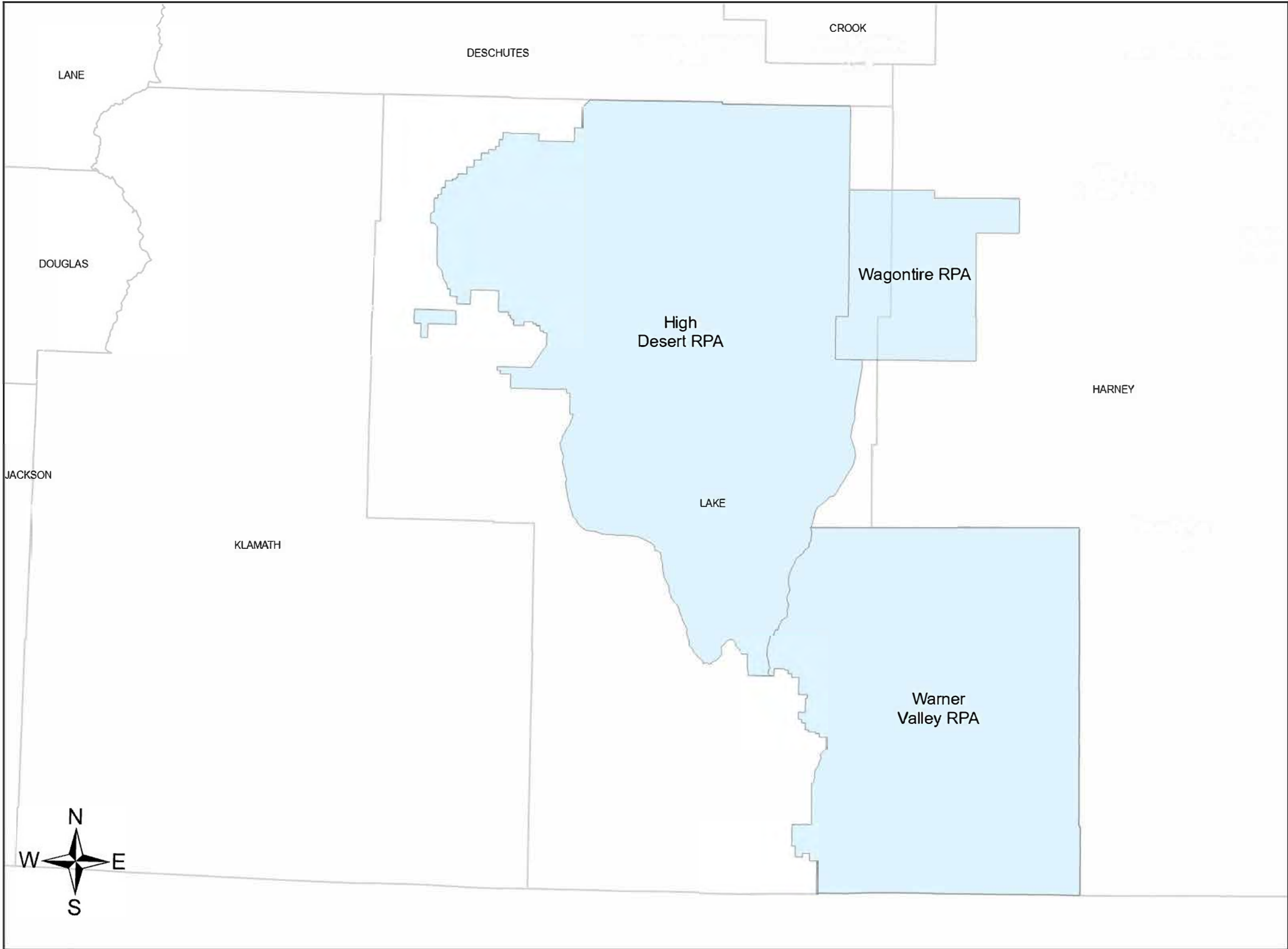
- Lake County
- Lowest Vulnerability (0-25th percentile)
- Low to Moderate Vulnerability (25-50)
- Moderate to High Vulnerability (50-75)
- Highest Vulnerability (75-100)

Figure 2. Overall Social Vulnerability by County

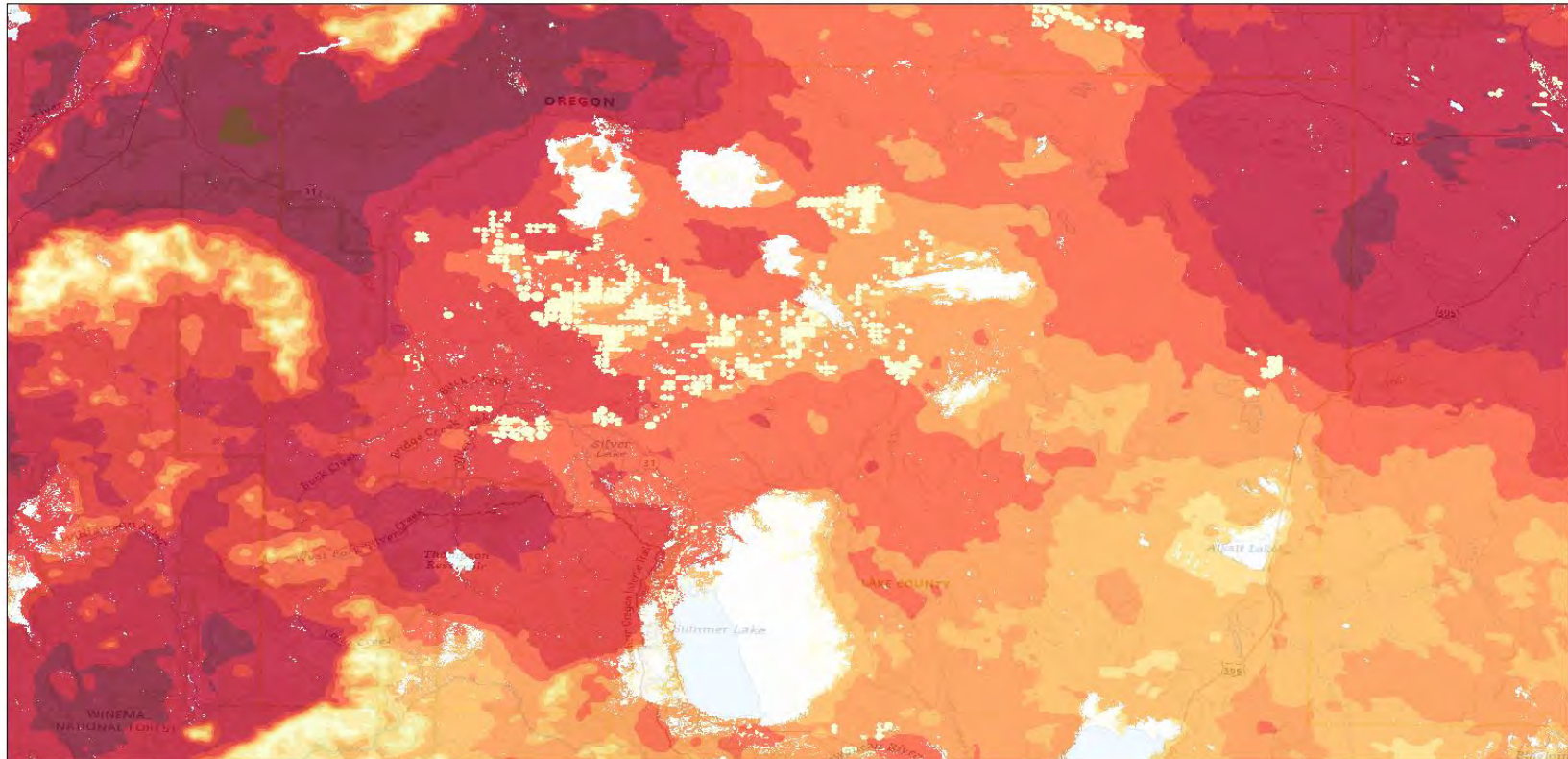
Lake County Fire Protection Districts



Lake County Rangeland Associations



North Lake Burn Probability



8/28/2024, 9:58:11 AM

States

Pacific Northwest 2022 - Burn Probability

0 (mapped as non-burnable)

0 - 0.0001000

0.0001000 - 0.0002154

0.0002154 - 0.0004642

0.0004642 - 0.0010000

0.0010000 - 0.0021544

0.0021544 - 0.004642

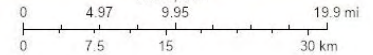
0.004642 to 0.010000

0.010000 to 0.021544

0.021544 to 0.046416

0.046416 to 0.100000 (highest probability)

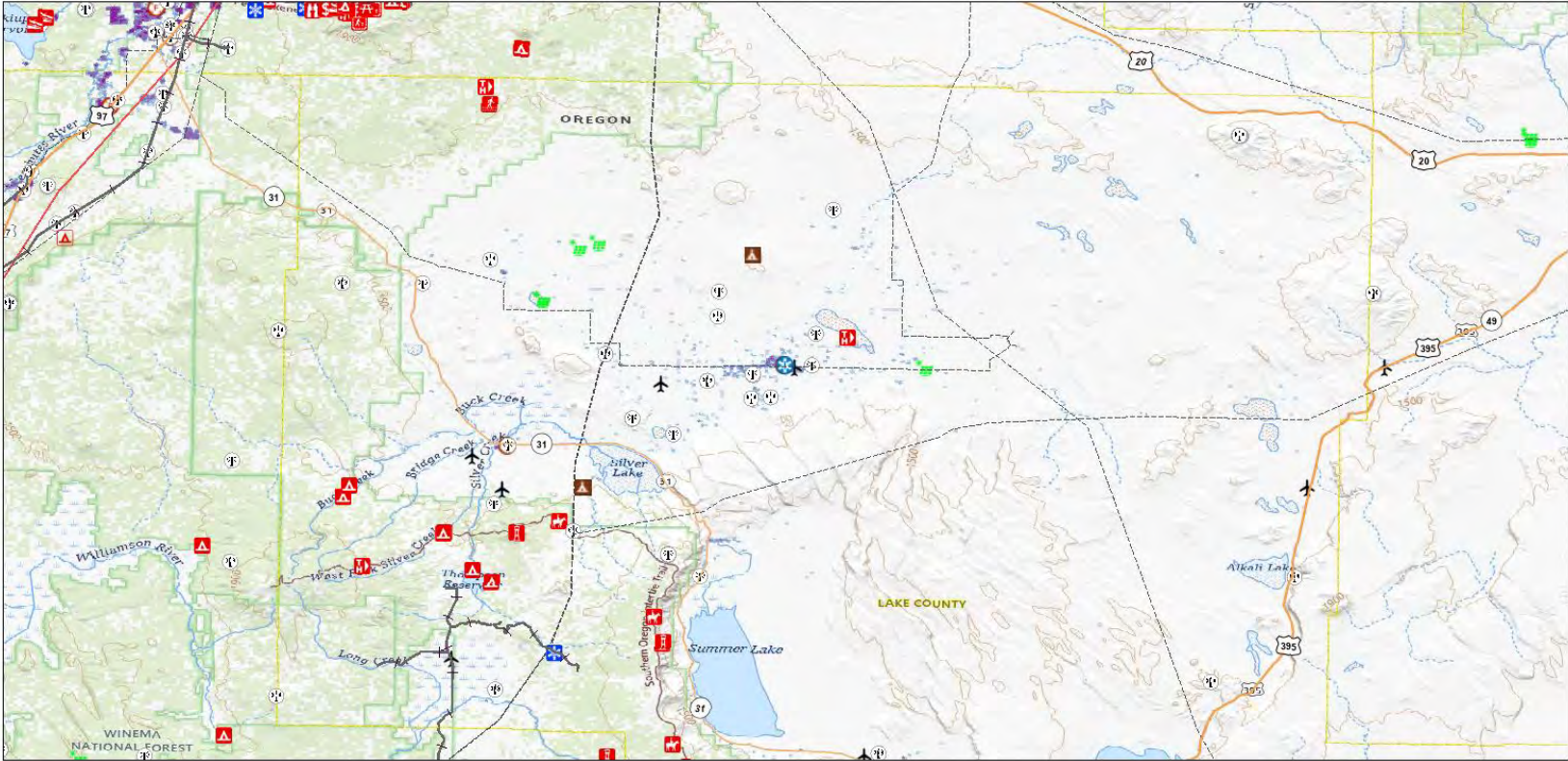
1:573,923



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data;

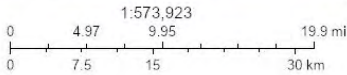
J.Morris

North Lake Critical Infrastructure



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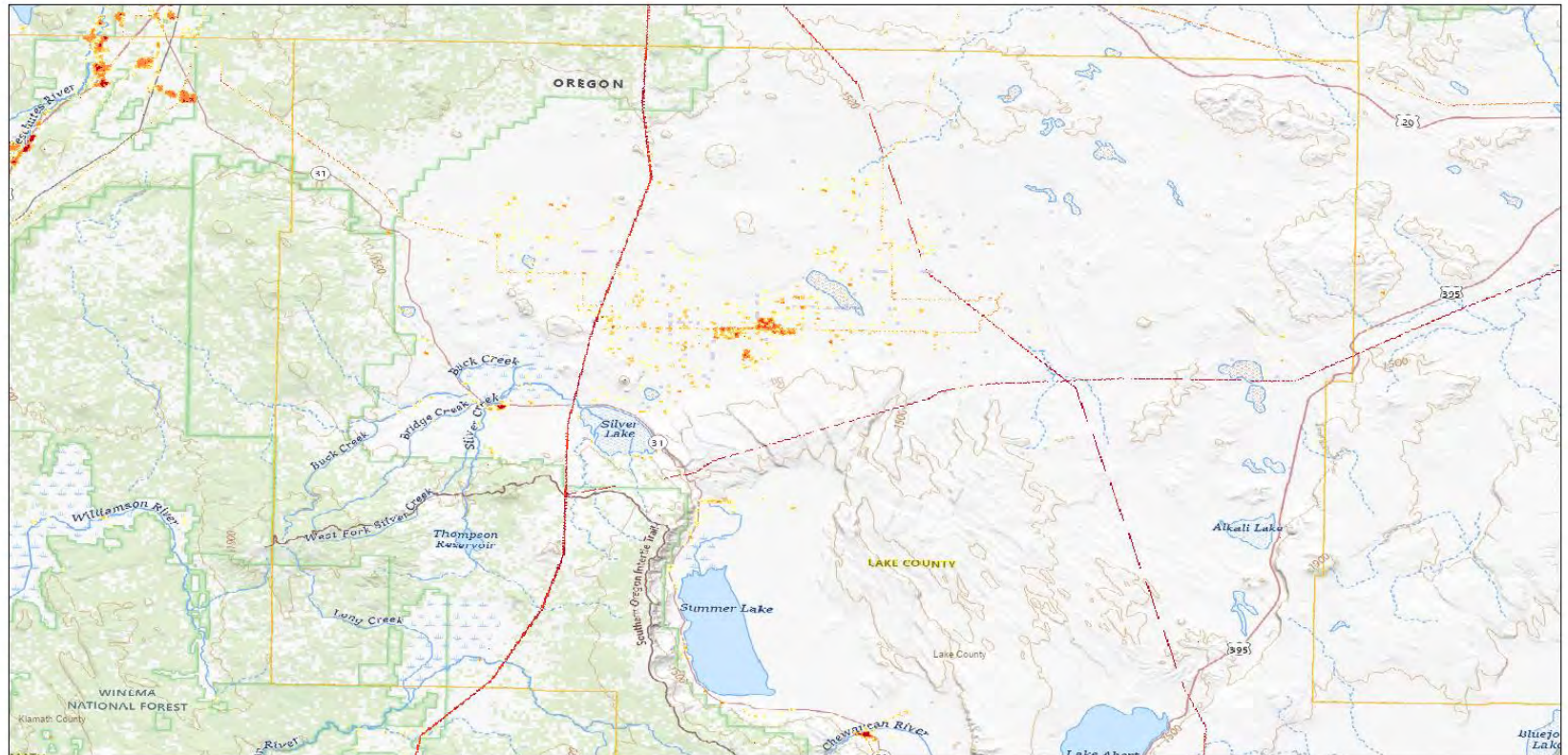
- Railroads
- Secondary Roads 578k scale
- Interstates and US Highways
- Other Roads
- Recreation Sites INFRA
- BOATING SITE
- CAMPGROUND
- CAMPING AREA
- DAY USE AREA
- GROUP CAMPGROUND
- HORSE CAMP
- INFO SITE/FEE STATION
- INTERPRETIVE SITE
- INTERPRETIVE SITE (ADMIN)
- LOOKOUT/CABIN
- OBSERVATION SITE
- PICNIC SITE
- SNOWPARK
- TRAILHEAD
- CAMPGROUND
- Electric Power Transmission Lines (High Voltage)
- Power Plants
- Solar
- Ambulance Services
- Fire and EMS Stations
- Natural Gas Pipelines (CONUS)
- Interstate
- Airports
- Airport
- WUI (Housing Unit Density) 2018
- Below Density Rating
- Very Low
- Low
- Medium
- Medium - High
- High
- Very High
- States



Source: U.S. Census Bureau, Funding for this project provided by USDA Forest Service, Fire and Aviation Management. Funding also provided by USDA Forest Service, Fire Modeling Institute, which is part of the Rocky Mountain Research Station, Fire, Fuel and Smoke Science Program. Work on dataset development was primarily

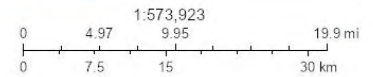
J.Morris

North Lake Expected Loss, Net Value Change with Fire Occurrence



8/28/2024, 10:55:11 AM

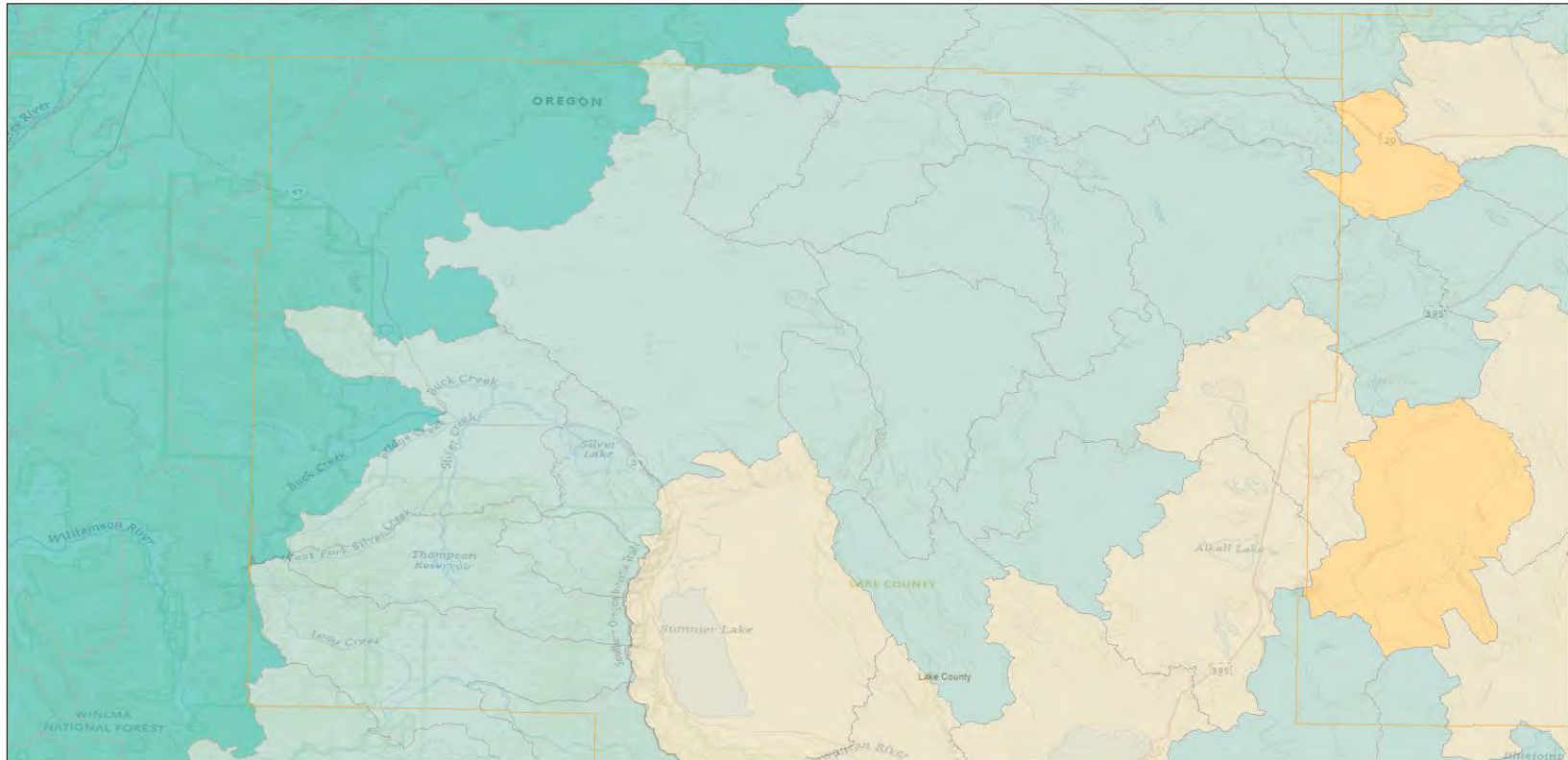
- States
- Counties
- NATIONAL - 2024 CONDITIONAL LOSS (oNVC) Assets and Drinking Water (People and Property, Critical Infrastructure, Historic Structures, Drinking Water) (Use if you have a fire)
- Very high loss (< -31,623)
- High loss (-31,623 to -10)
- Moderate loss (-10 to -3,1623)
- Low loss (-3,1623 to -1)
- Very low loss (-1 to 0)
- Unquantified impact to people and property in core developed



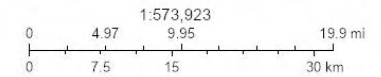
USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data;

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North Lake Fire departure



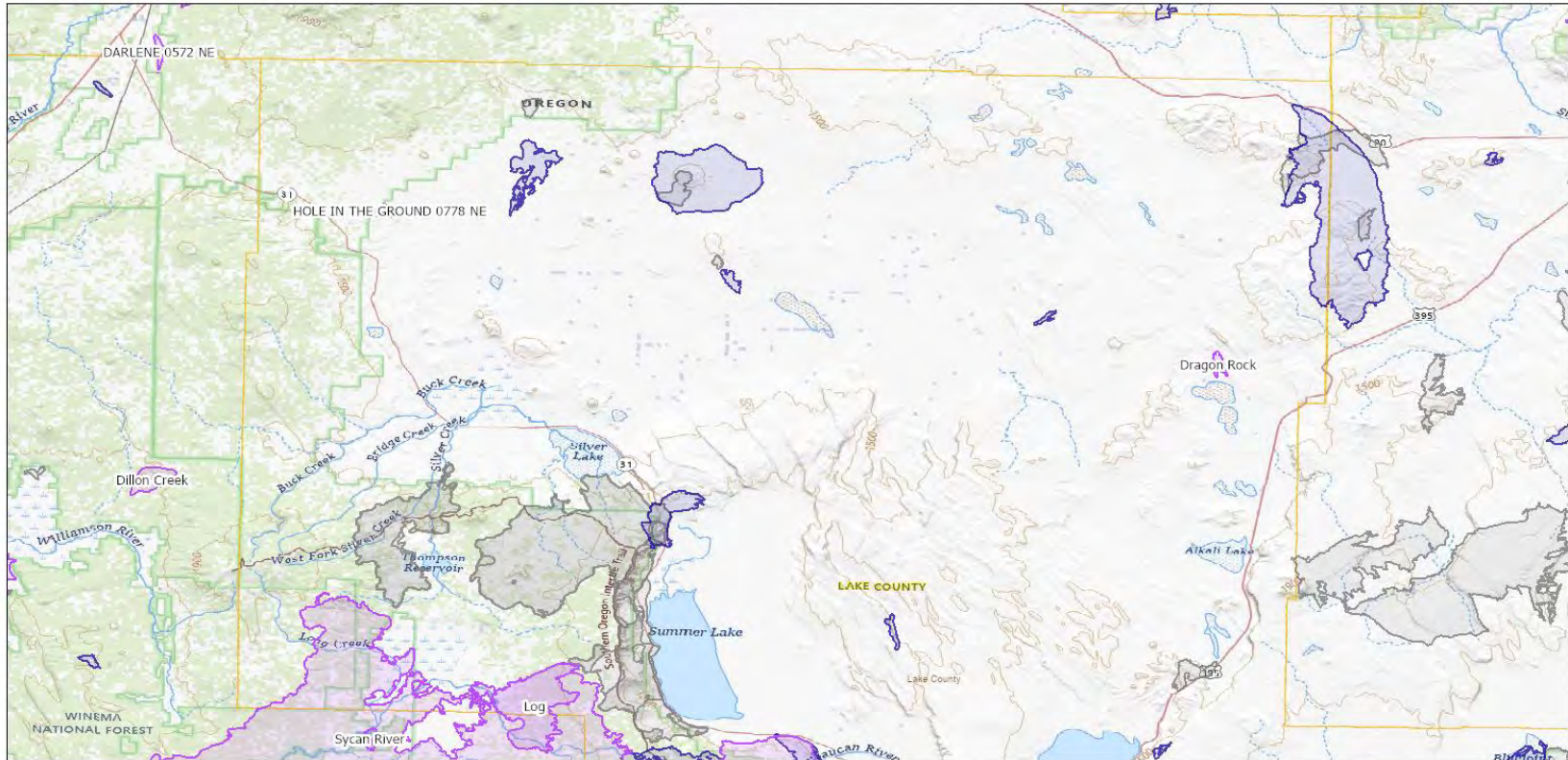
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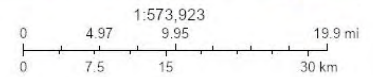
J.Morris

North Lake Fire History 2000-2023 300 acres+



8/28/2024, 10:19:06 AM

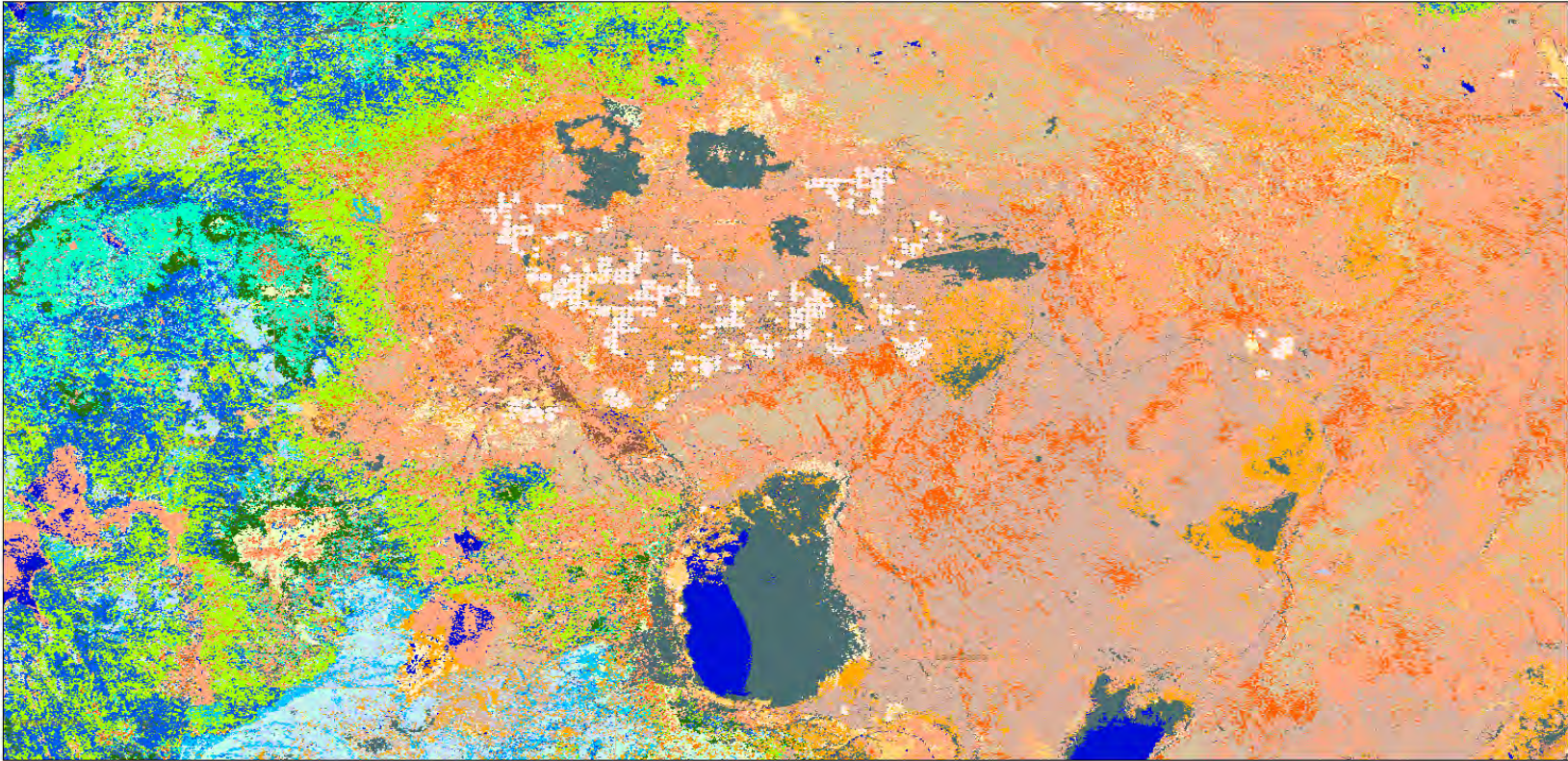
- Historical Fire Perimeters (2020 - 2023, 300+ Acres)
- Historical Fire Perimeters (2011 - 2019, 300+ Acres)
- Historical Fire Perimeters (2000 - 2010, 300+ Acres)
- States
- Counties



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data;

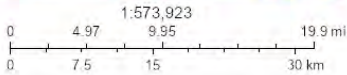
J.Morris

North Lake Fuel Models



8/28/2024, 10:39:24 AM

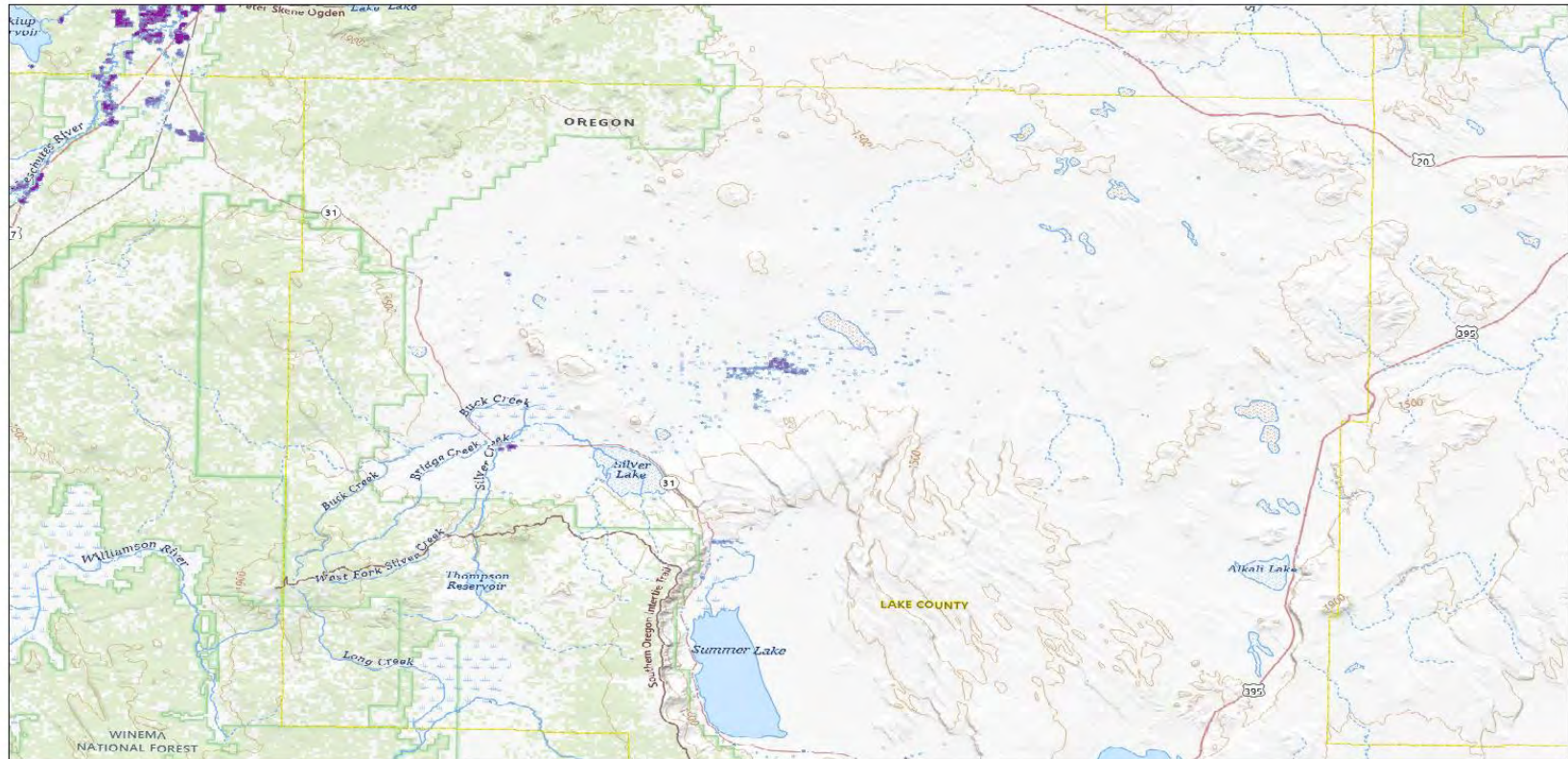
States	NB9	GS3	SH6	TL1	TL7
Counties	GR1	SH1	SH7	TL2	TL8
LANDFIRE Fuel Models v2.3.0 (CONUS)	GR2	SH2	TU1	TL3	TL9
NB1	GR3	SH3	TU2	TL4	SB1
NB3	GS1	SH4	TU3	TL5	
NB8	GS2	SH5	TU5	TL6	



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data;

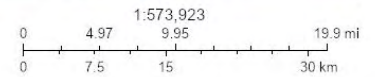
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North Housing Density



8/28/2024, 9:33:56 AM

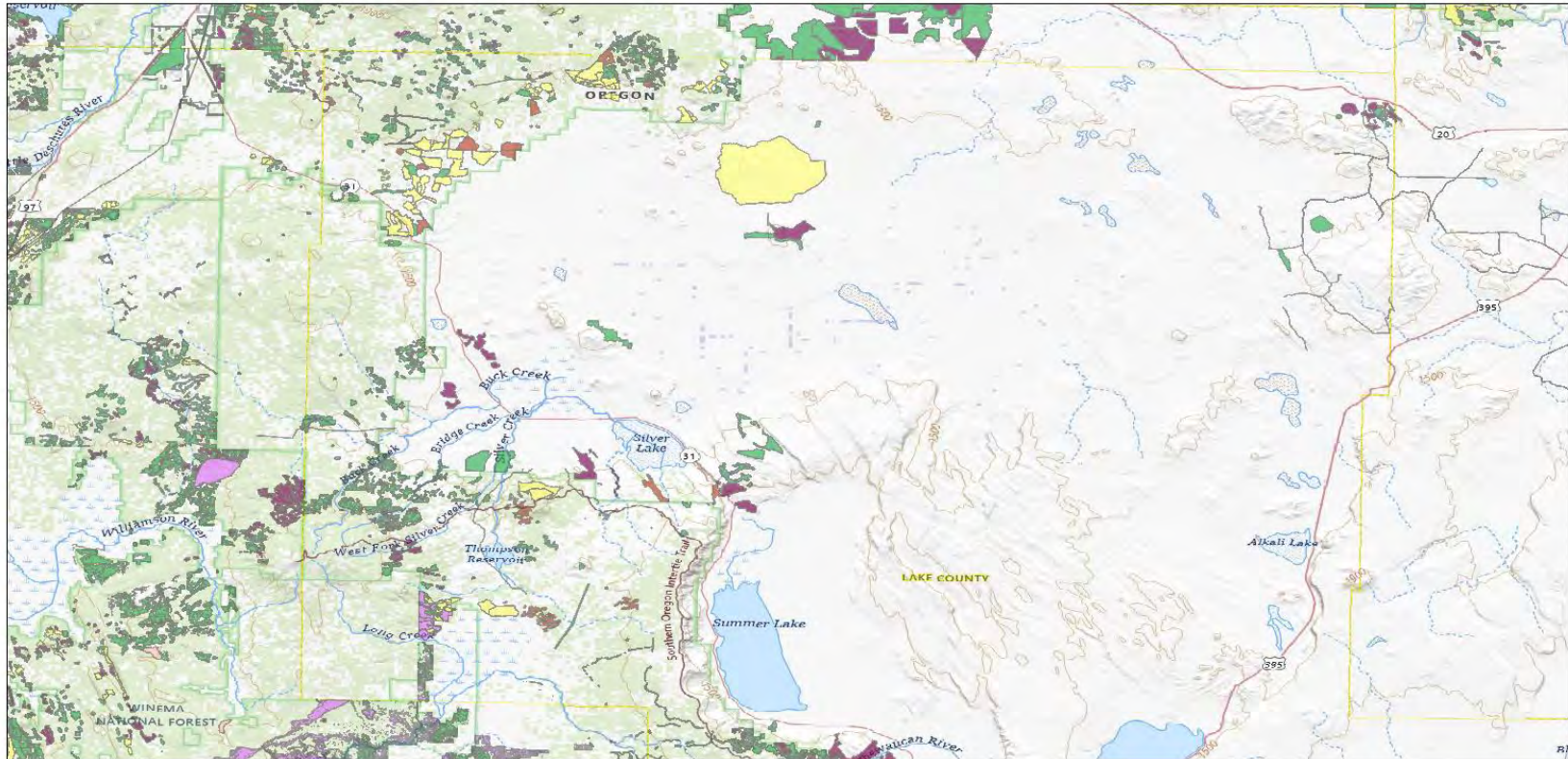
WUI (Housing Unit Density) 2018



Funding for this project provided by USDA Forest Service, Fire and Aviation Management. Funding also provided by USDA Forest Service, Fire Modeling Institute, which is part of the Rocky Mountain Research Station, Fire, Fuel and Smoke Science Program. Work on dataset development was primarily completed by the USDA Forest

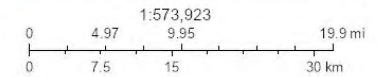
J.Morris

North Lake Interagency Fuel Treatments



8/28/2024, 10:12:48 AM

- States
- Integrated Interagency Fuels Treatments (2000 - Present)
 - Fire - Broadcast Burn
 - Fire - Fire Use
 - Fire - Other
 - Mechanical
 - Other
 - Wildfire Non-Treatment



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data;

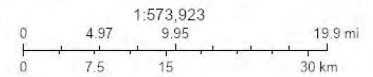
J.Morris

North Lake POD Boundaries



8/28/2024, 9:49:37 AM

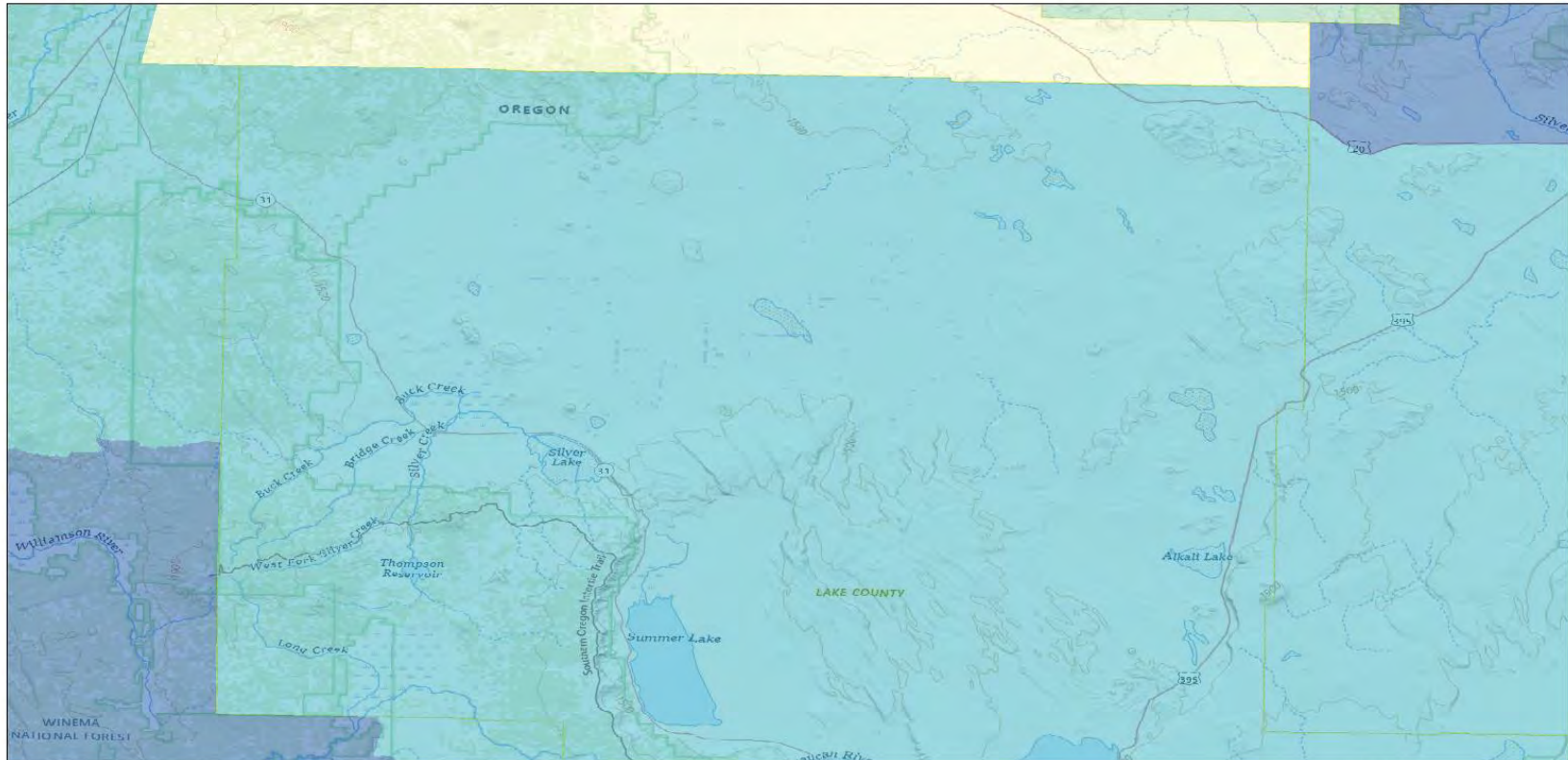
- States
- PODs National Feature Service (Polys)



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data;

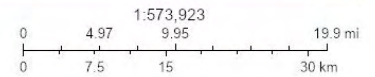
J.Morris

North Lake Social Vulnerability



8/28/2024, 9:51:52 AM

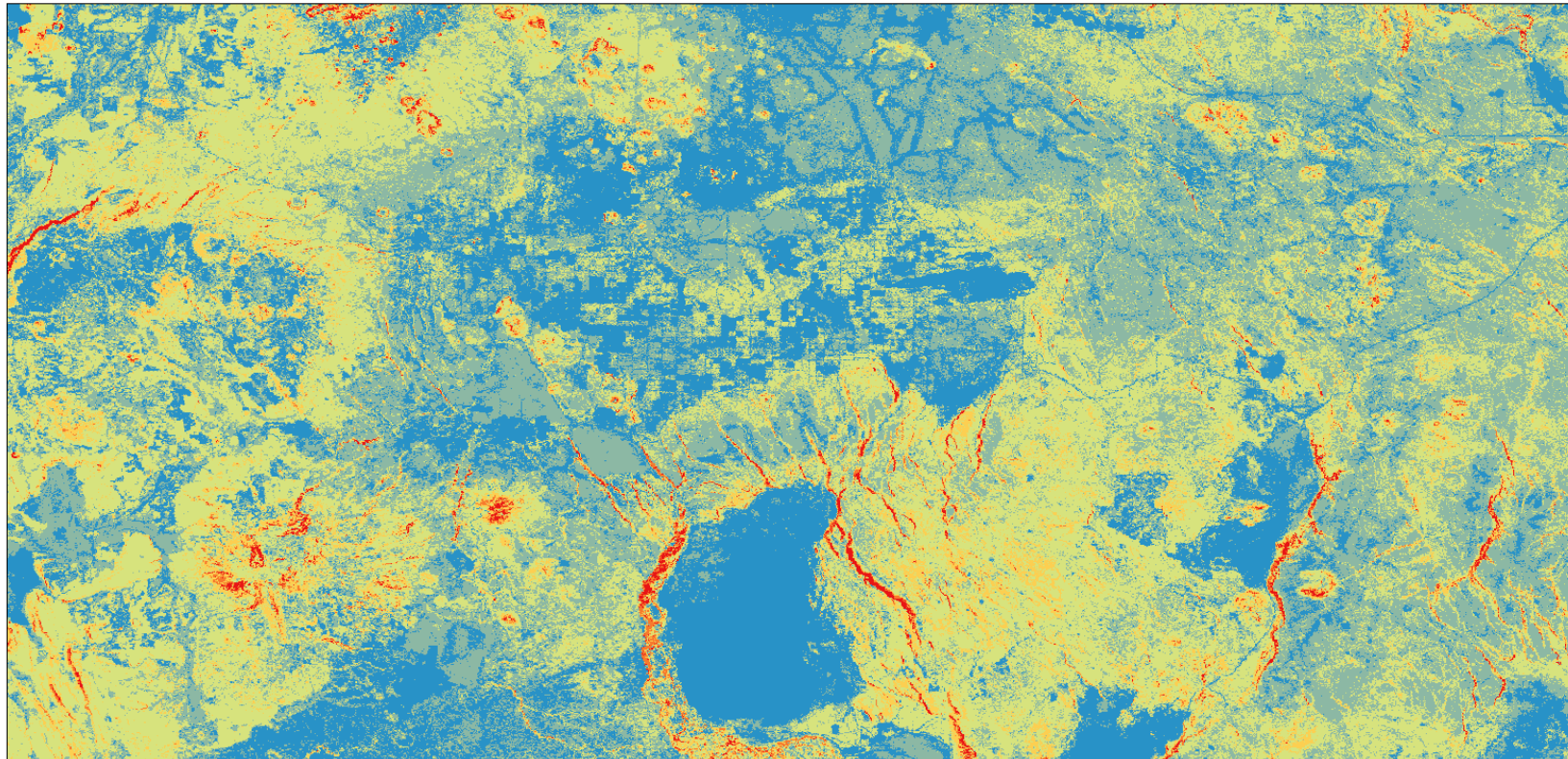
- States
- Social Vulnerability Index Overall 2018 - Tracts
- 0 - 0.25
- 0.25 - 0.5
- 0.5 - 0.75
- 0.75 - 1



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data;

J.Morris

North Lake Suppression Difficulty



8/28/2024, 10:02:26 AM

States

Suppression Difficulty Index (SDI) - 97th Percentile Weather 2024

Lowest Difficulty (0-10)

10-20

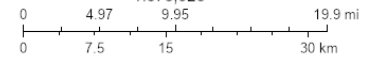
20-40

40-70

70-100

Highest Difficulty (>100)

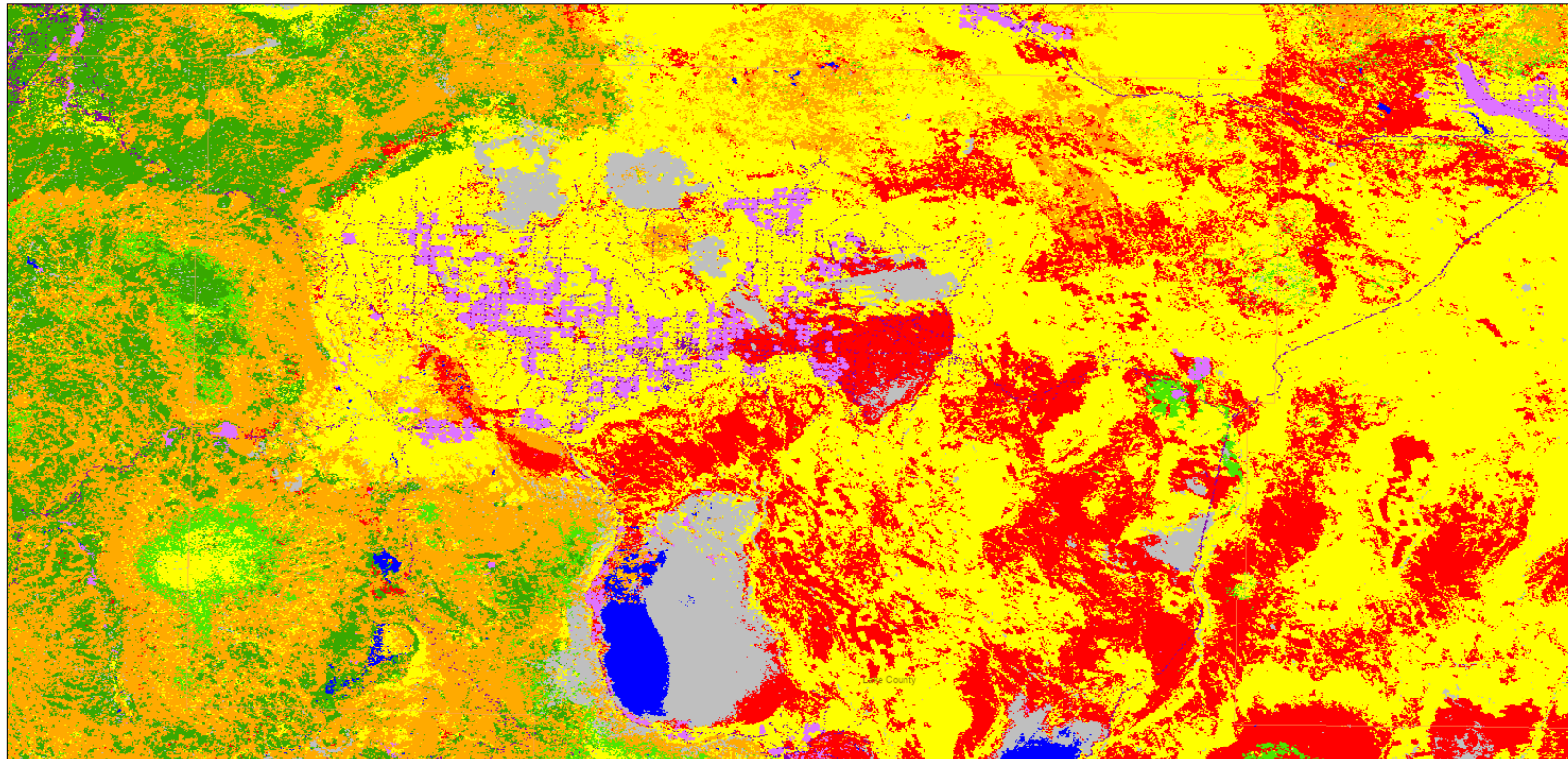
1:573,923



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data;

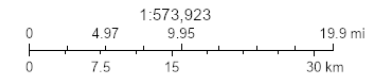
J.Morris

North Lake Vegetation Condition Class



8/28/2024, 10:32:28 AM

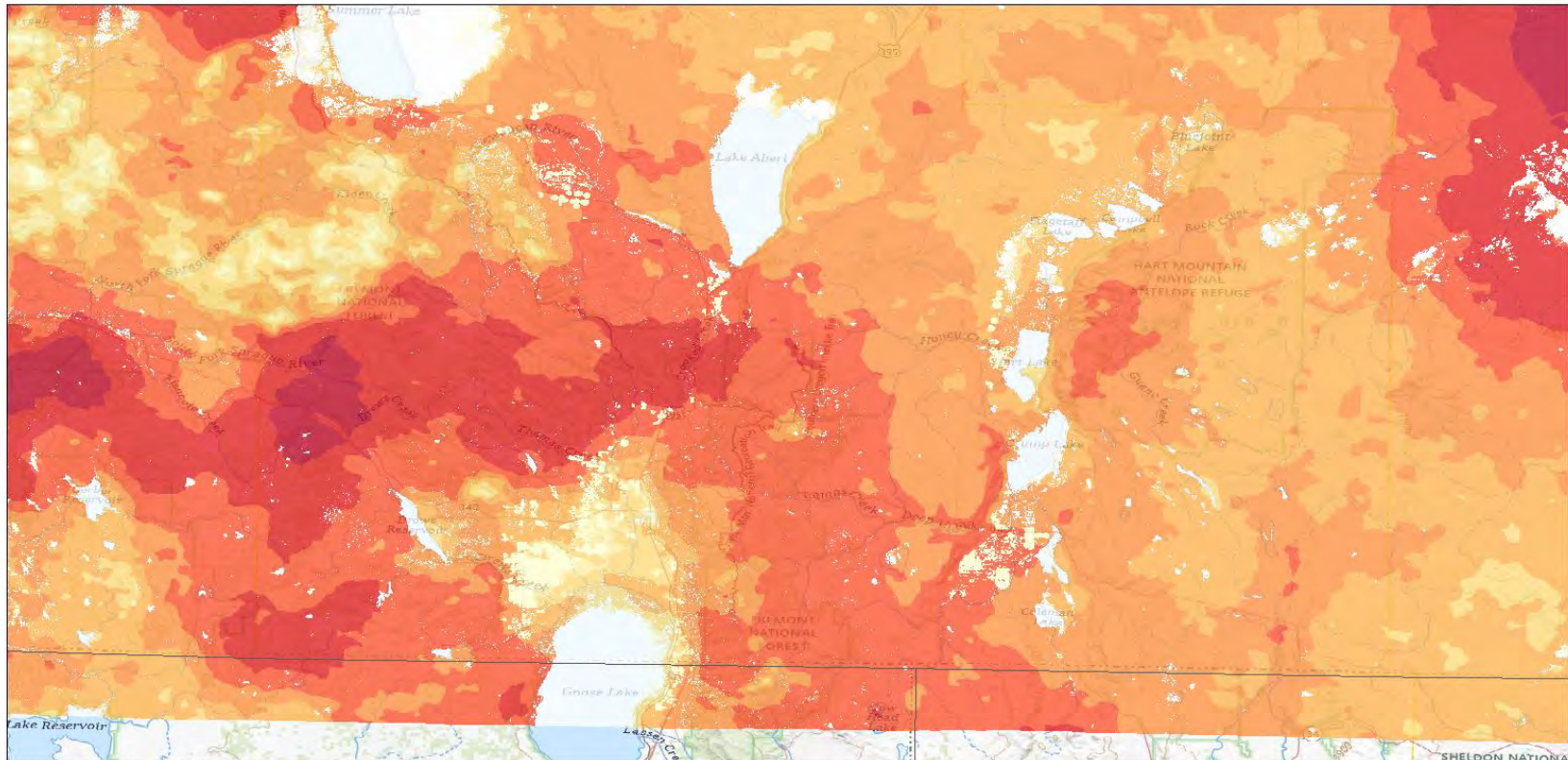
- | | | |
|--|----------------------------------|------------------|
| States | Vegetation Condition Class I.B | Water |
| Counties | Vegetation Condition Class II.A | Developed |
| LANDFIRE Vegetation Condition Class (CONUS) v2.3.0 | Vegetation Condition Class II.B | Barren or Sparse |
| Vegetation Condition Class I.A | Vegetation Condition Class III.A | Agriculture |



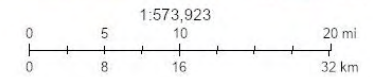
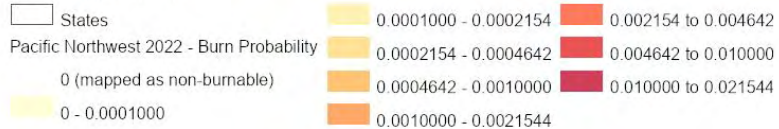
USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data;

J.Morris

South Lake Burn Probability



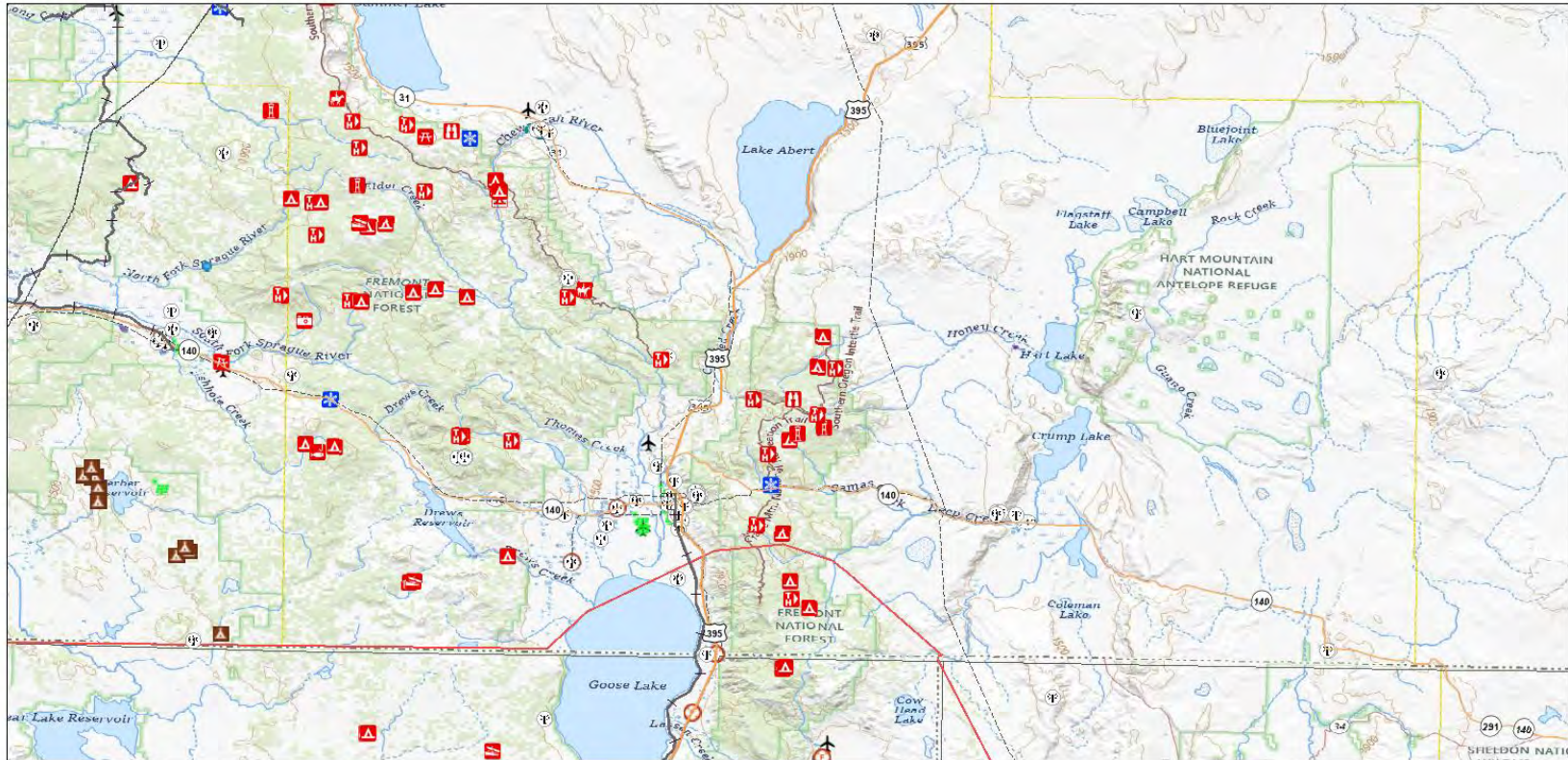
8/28/2024, 9:56:30 AM



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data;

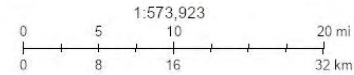
J.Morris

South Lake Critical Infrastructure



8/28/2024, 9:43:15 AM

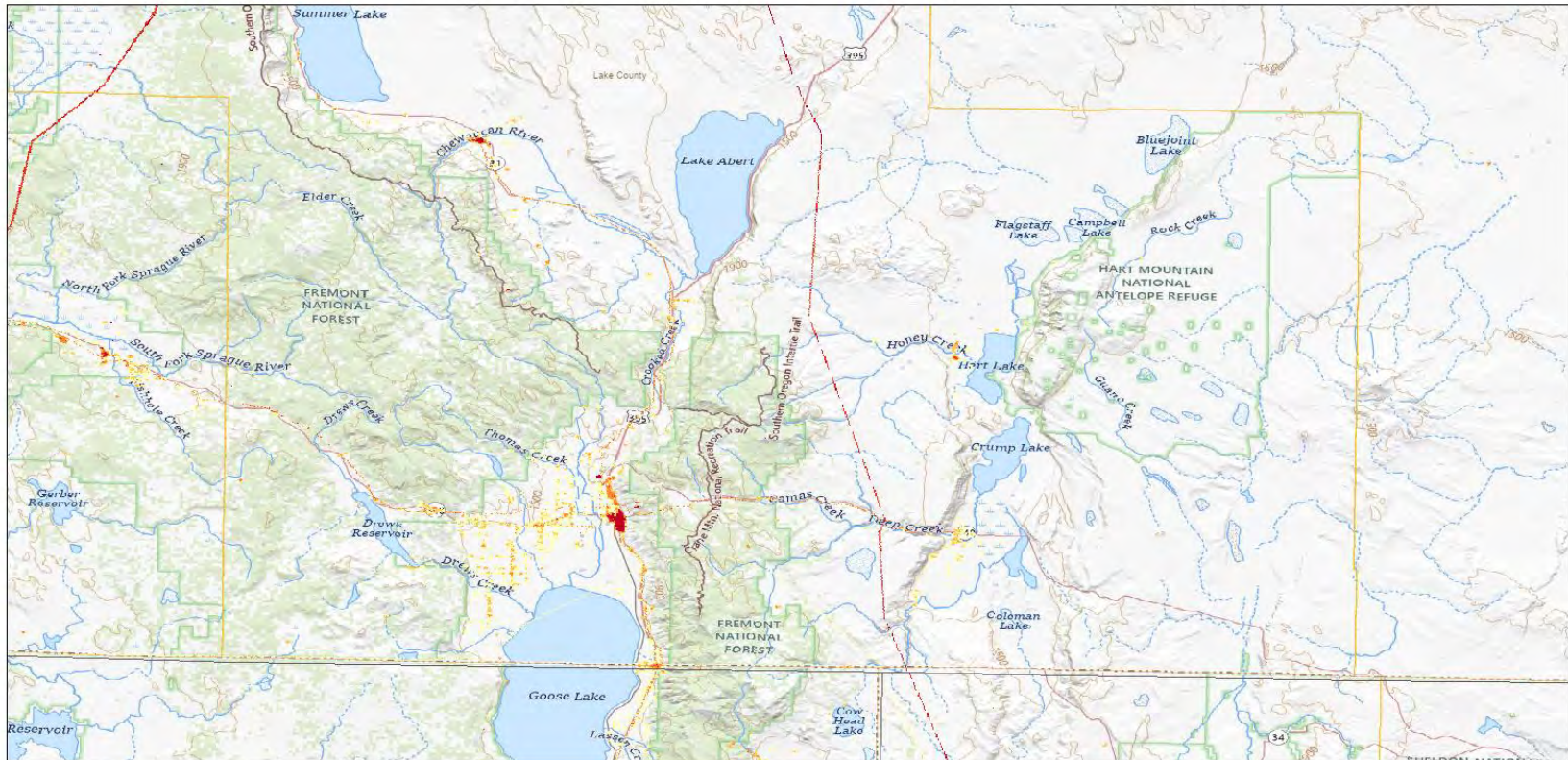
- Railroads
- Secondary Roads 578k scale
- Interstates and US Highways
- Other Roads
- Recreation Sites INFRA
- BOATING SITE
- CAMPGROUND
- CAMPING AREA
- DOCUMENTARY SITE
- FISHING SITE
- GROUP PICNIC SITE
- HORSE CAMP
- LOOKOUT/CABIN
- OBSERVATION SITE
- PICNIC SITE
- SNOWPARK
- TRAILHEAD
- CAMPGROUND
- Electric Power Transmission Lines (High Voltage)
- Communication Towers (NPS and HIFLD)
- Power Plants
- Solar
- Hydroelectric
- Geothermal
- Hospitals and Medical Centers
- Ambulance Services
- Fire and EMS Stations
- Natural Gas Pipelines (CONUS)
- Airports
- Airport
- Heliprot
- WUI (Housing Unit Density) 2018
- Below Density Rating
- Very Low
- Low
- Medium
- Medium - High
- High
- Very High
- States



Source: U.S. Census Bureau, Funding for this project provided by USDA Forest Service, Fire and Aviation Management. Funding also provided by USDA Forest Service, Fire Modeling Institute, which is part of the Rocky Mountain Research Station, Fire, Fuel and Smoke Science Program. Work on dataset development was primarily

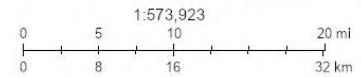
J.Morris

South Lake Expected Loss, Net Value Change with Fire Occurrence



8/28/2024, 10:56:41 AM

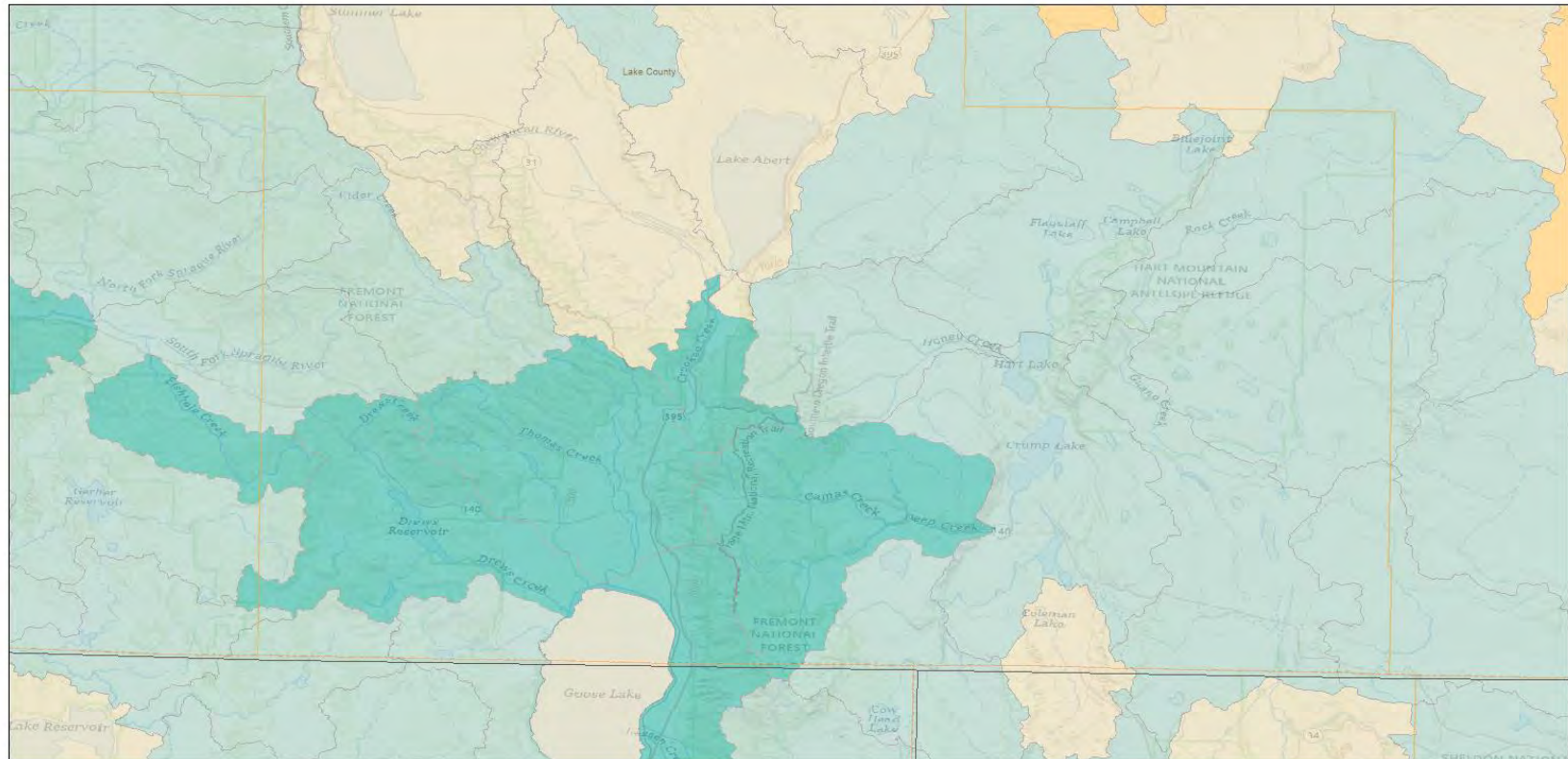
- States
 - Counties
- NATIONAL - 2024 CONDITIONAL LOSS (CNVC) Assets and Drinking Water (People and Property, Critical Infrastructure, Historic Structures, Drinking Water) (Use if you have a fire)
- Very high loss (< -31.623)
 - High loss (-31.623 to -10)
 - Moderate loss (-10 to -3.1623)
 - Low loss (-3.1623 to -1)
 - Very low loss (-1 to 0)



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data;

J.Morris

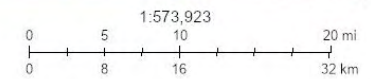
South Lake Fire departure



8/28/2024, 10:25:46 AM



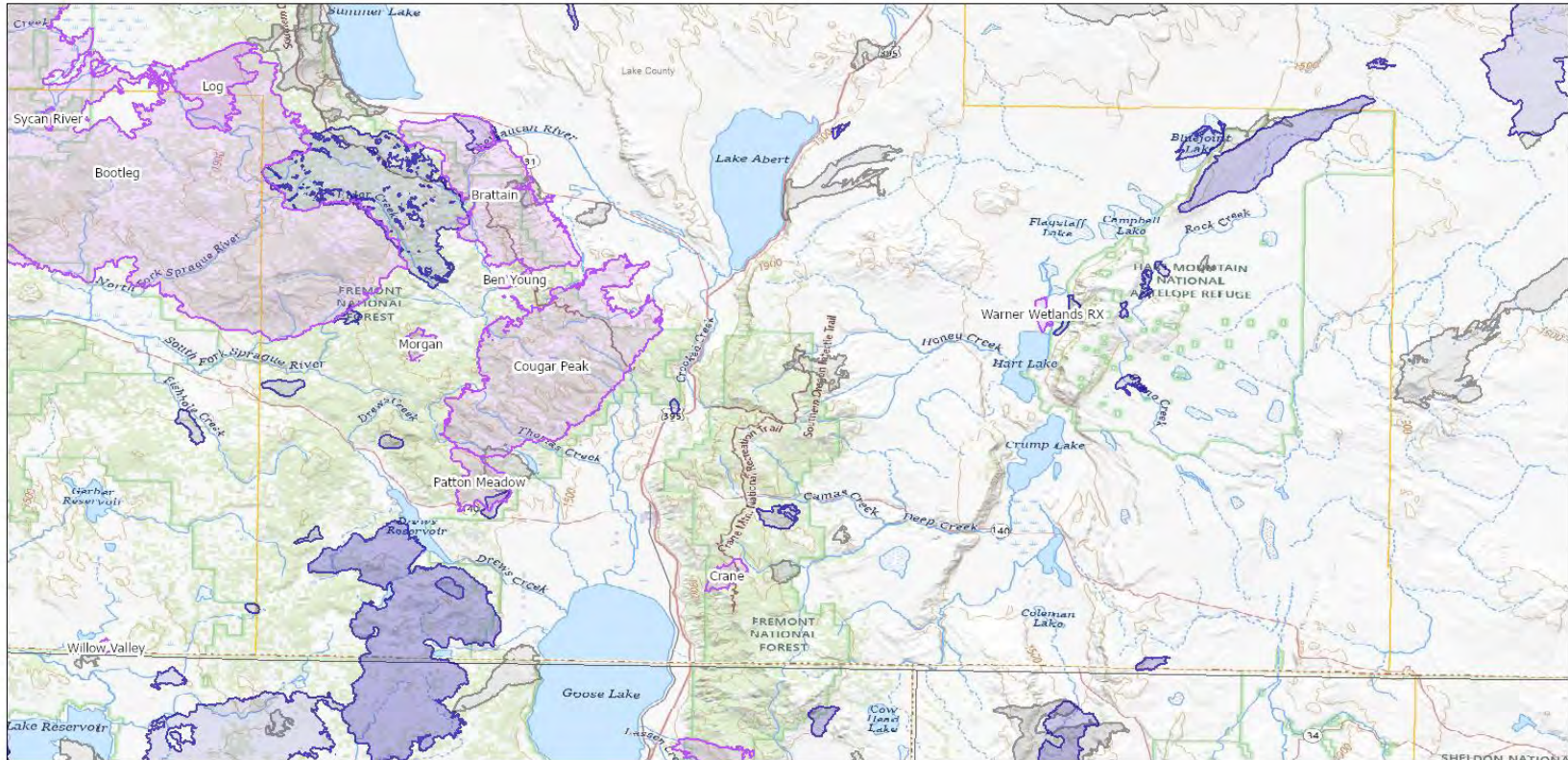
Percent Fire Return Interval Departure by HUC10 Watershed



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data;

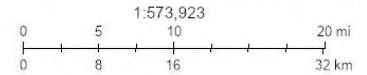
J.Morris

South Lake Fire History 2000-2023 300 acres+



8/28/2024, 10:21:05 AM

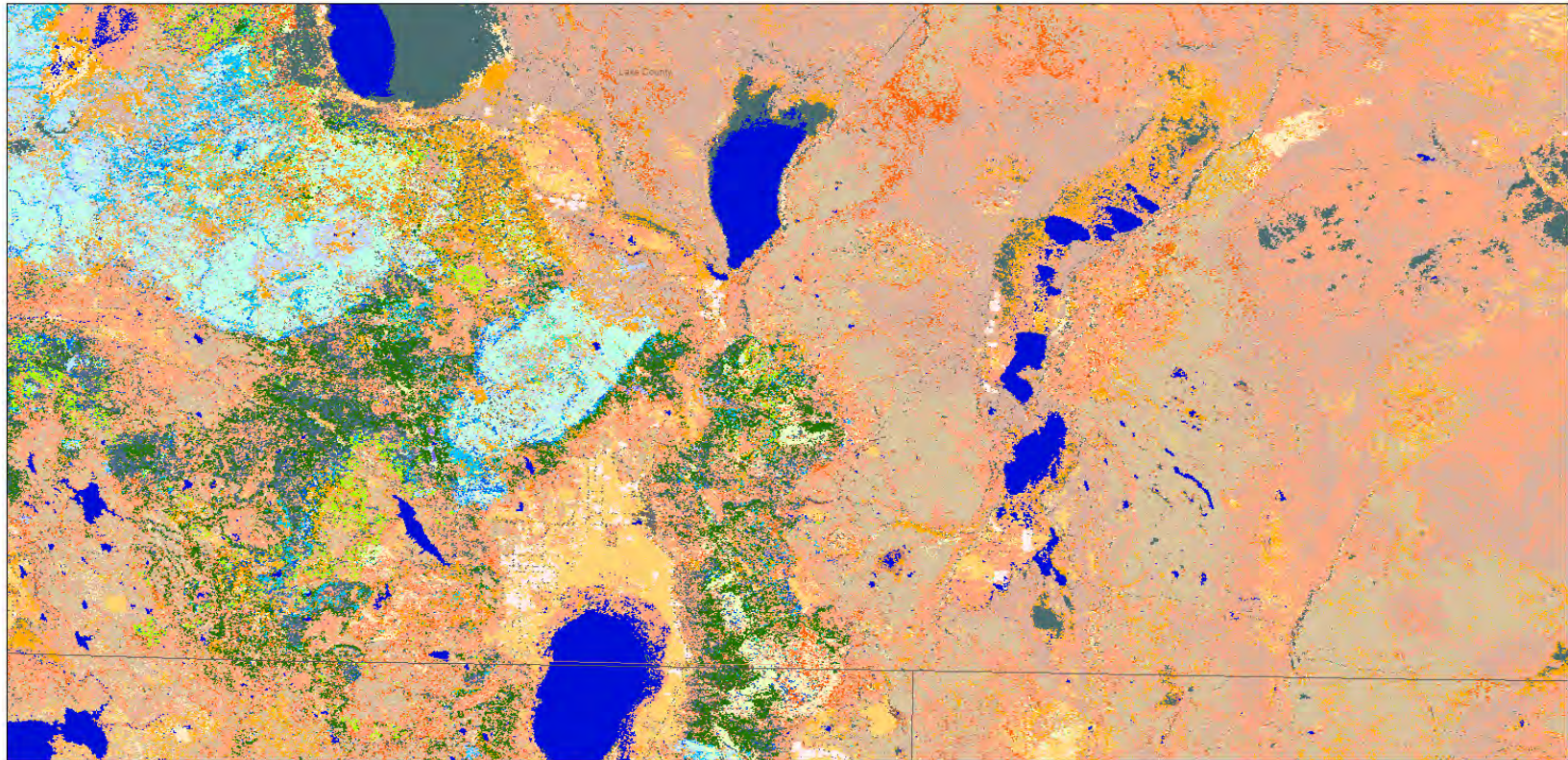
- Historical Fire Perimeters (2020 - 2023, 300+ Acres)
- Historical Fire Perimeters (2011 - 2019, 300+ Acres)
- Historical Fire Perimeters (2000 - 2010, 300+ Acres)
- States
- Counties



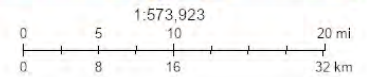
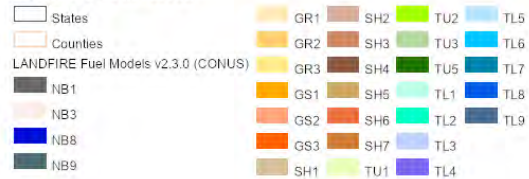
USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data;

J.Morris

South Lake Fuel Models



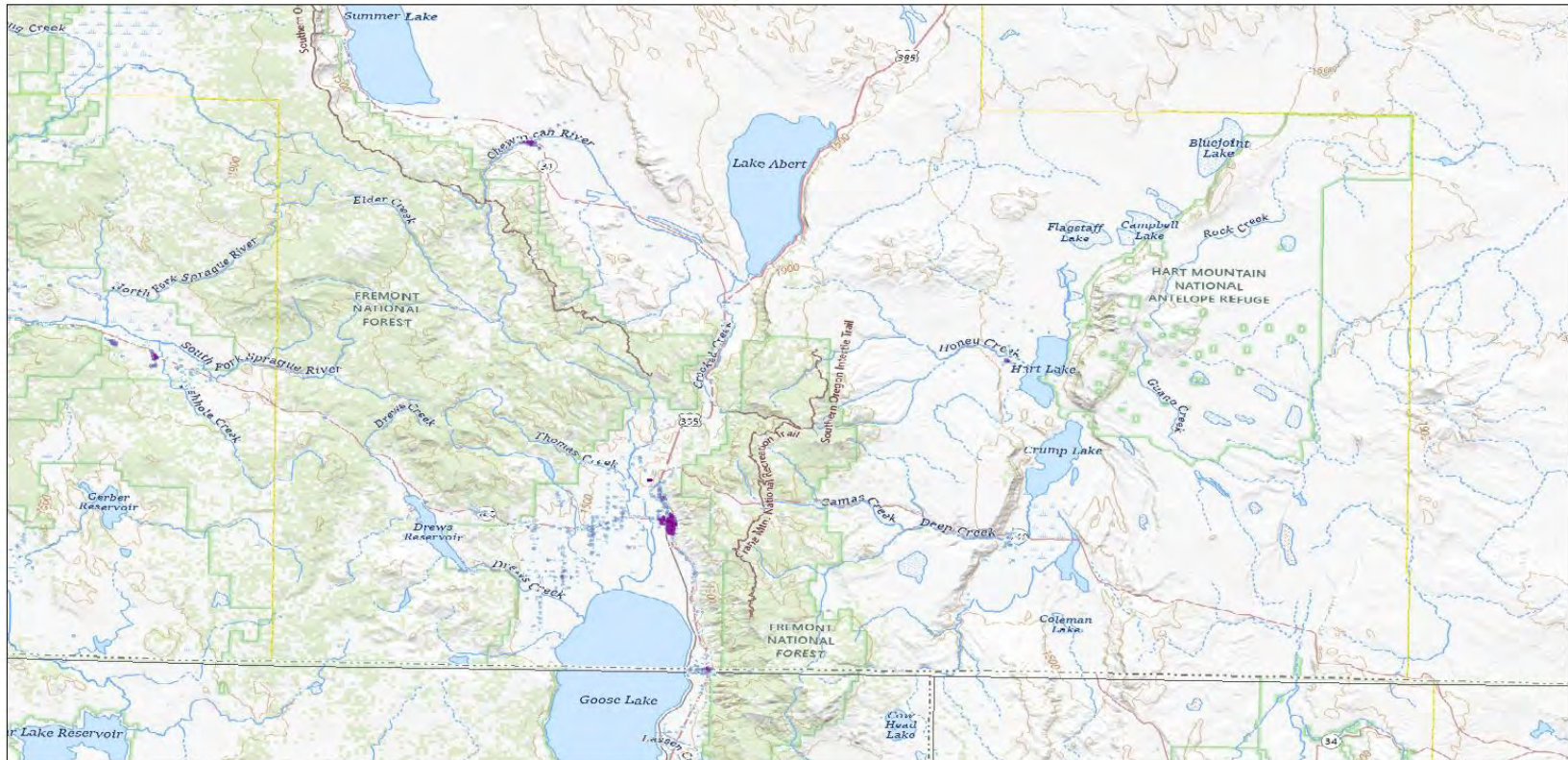
8/28/2024, 10:36:50 AM



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data;

J.Morris

South Housing Density

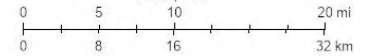


8/28/2024, 9:22:42 AM

WUI (Housing Unit Density) 2018



1:572,642



Funding for this project provided by USDA Forest Service, Fire and Aviation Management. Funding also provided by USDA Forest Service, Fire Modeling Institute, which is part of the Rocky Mountain Research Station, Fire, Fuel and Smoke Science Program. Work on dataset development was primarily completed by the USDA Forest

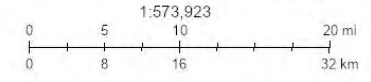
Risk Management Assistance (RMA)

South Lake POD Boundaries



8/28/2024, 9:47:35 AM

- States
- PODs National Feature Service (Polys)



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data;

J.Morris

South Lake Social Vulnerability



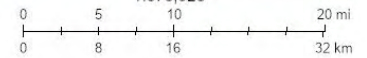
8/28/2024, 9:53:22 AM

States

Social Vulnerability Index Overall 2018 - Tracts

- 0.25 - 0.5
- 0.5 - 0.75
- 0.75 - 1

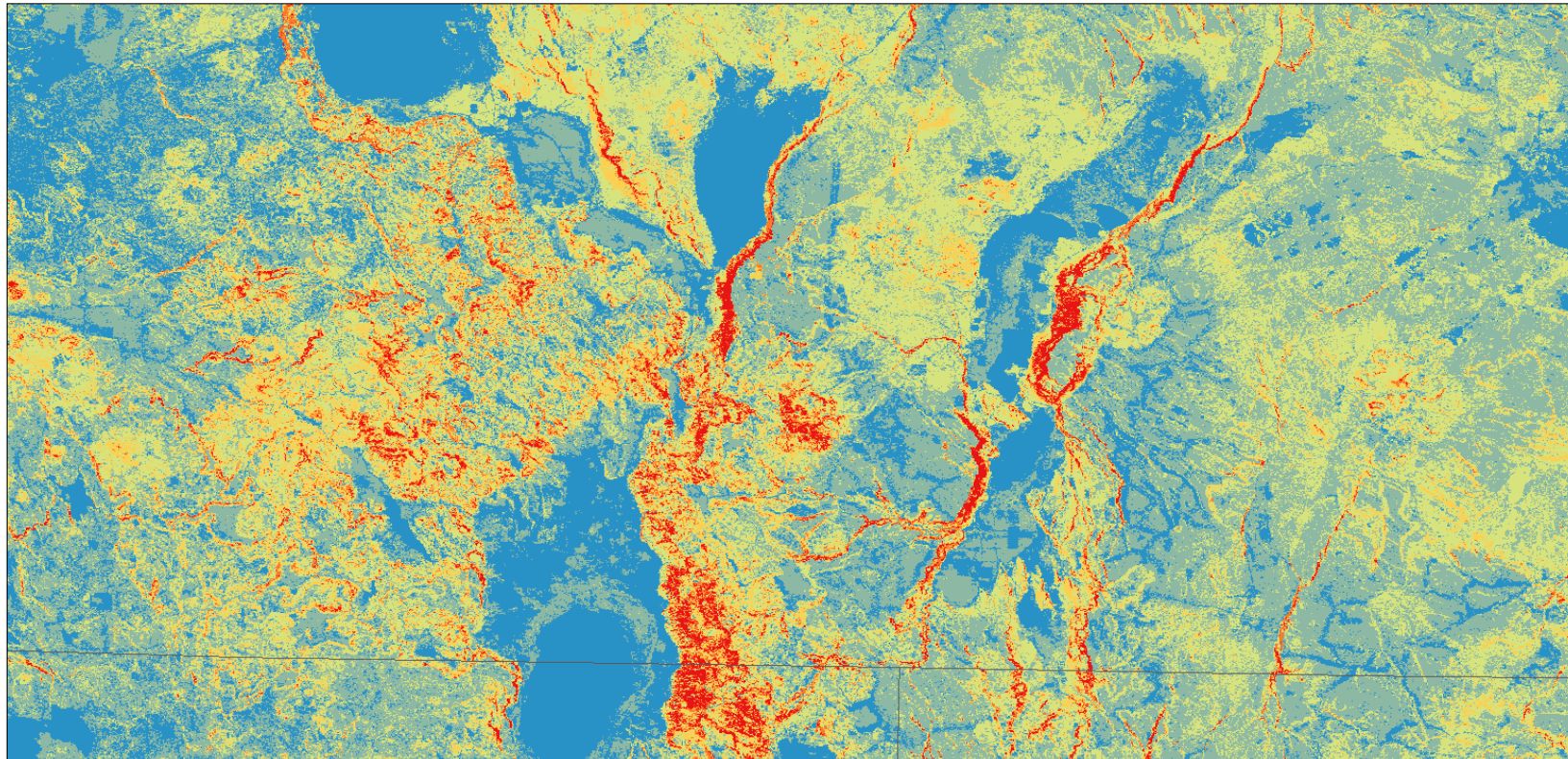
1:573,923



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data;

J.Morris

South Lake Suppression Difficulty



8/28/2024, 10:05:13 AM

States

Suppression Difficulty Index (SDI) - 97th Percentile Weather 2024

Lowest Difficulty (0-10)

10-20

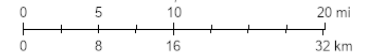
20-40

40-70

70-100

Highest Difficulty (>100)

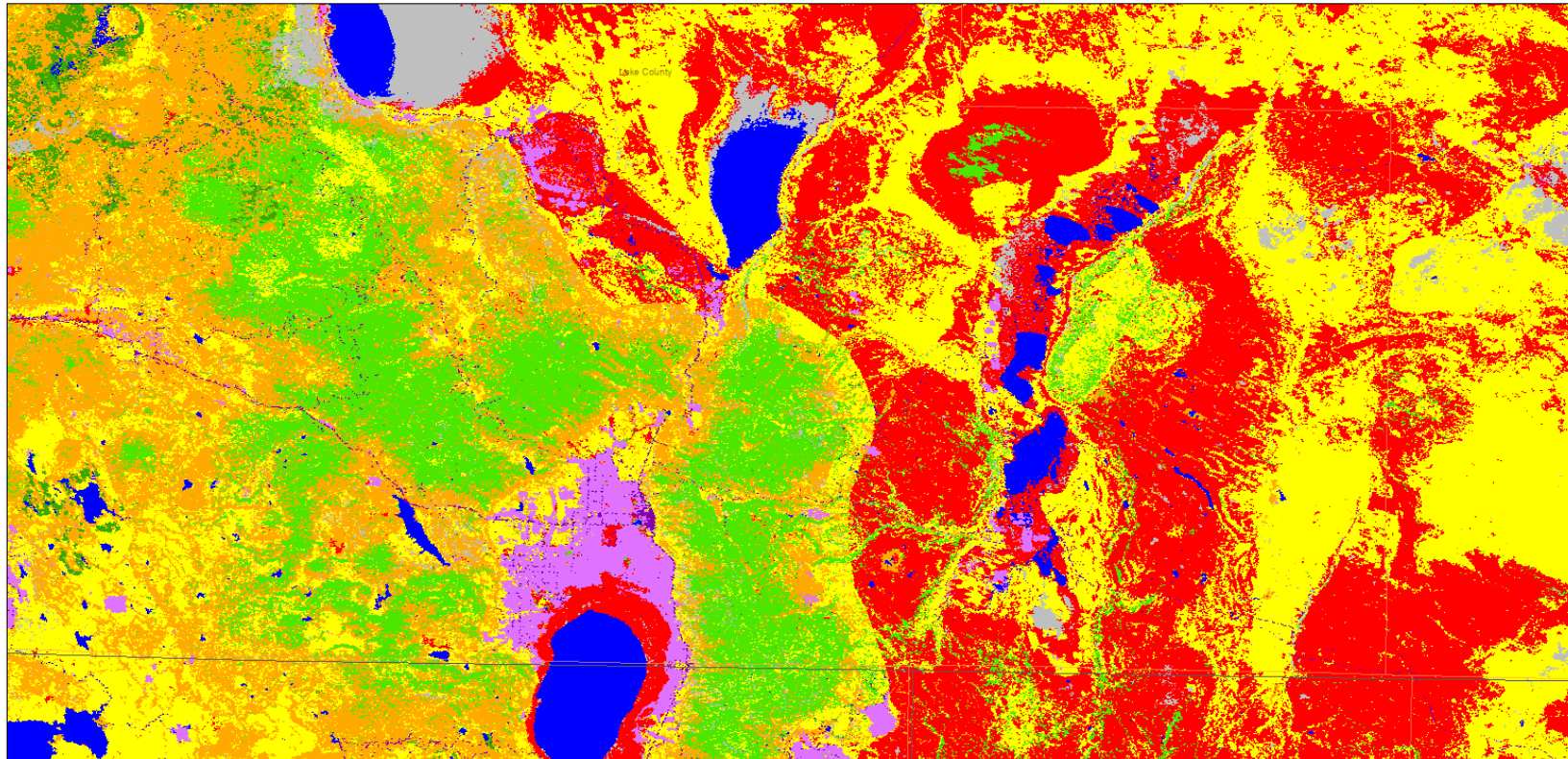
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USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data;

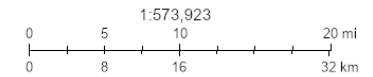
J.Morris

South Lake Vegetation Condition Class



8/28/2024, 10:33:47 AM

- States
- Counties
- Vegetation Condition Class I.A
- Vegetation Condition Class I.B
- Vegetation Condition Class II.A
- Vegetation Condition Class II.B
- Vegetation Condition Class III.A
- Water
- Developed
- Barren or Sparse
- Agriculture



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data;

J.Morris