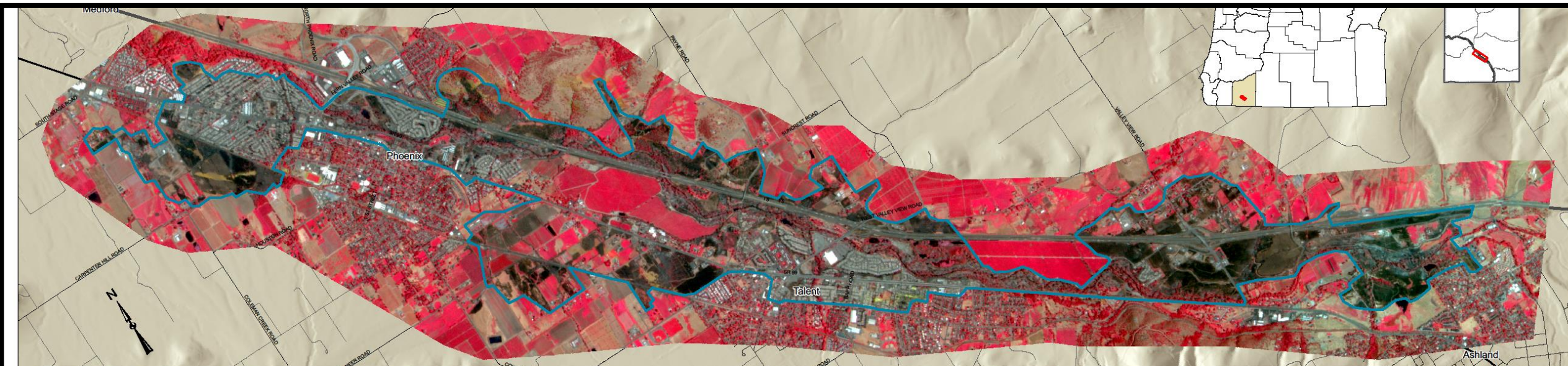




Mapping Wildfire Risk to the Wildland-Urban Interface of Oregon

Christopher J. Dunn, Oregon State University, Corvallis, OR. chris.dunn@oregonstate.edu

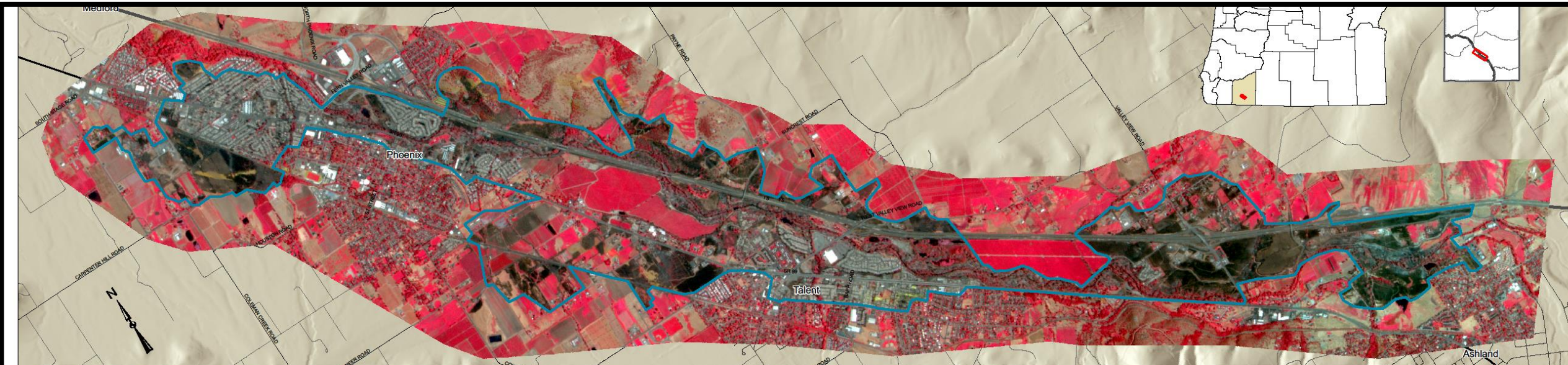


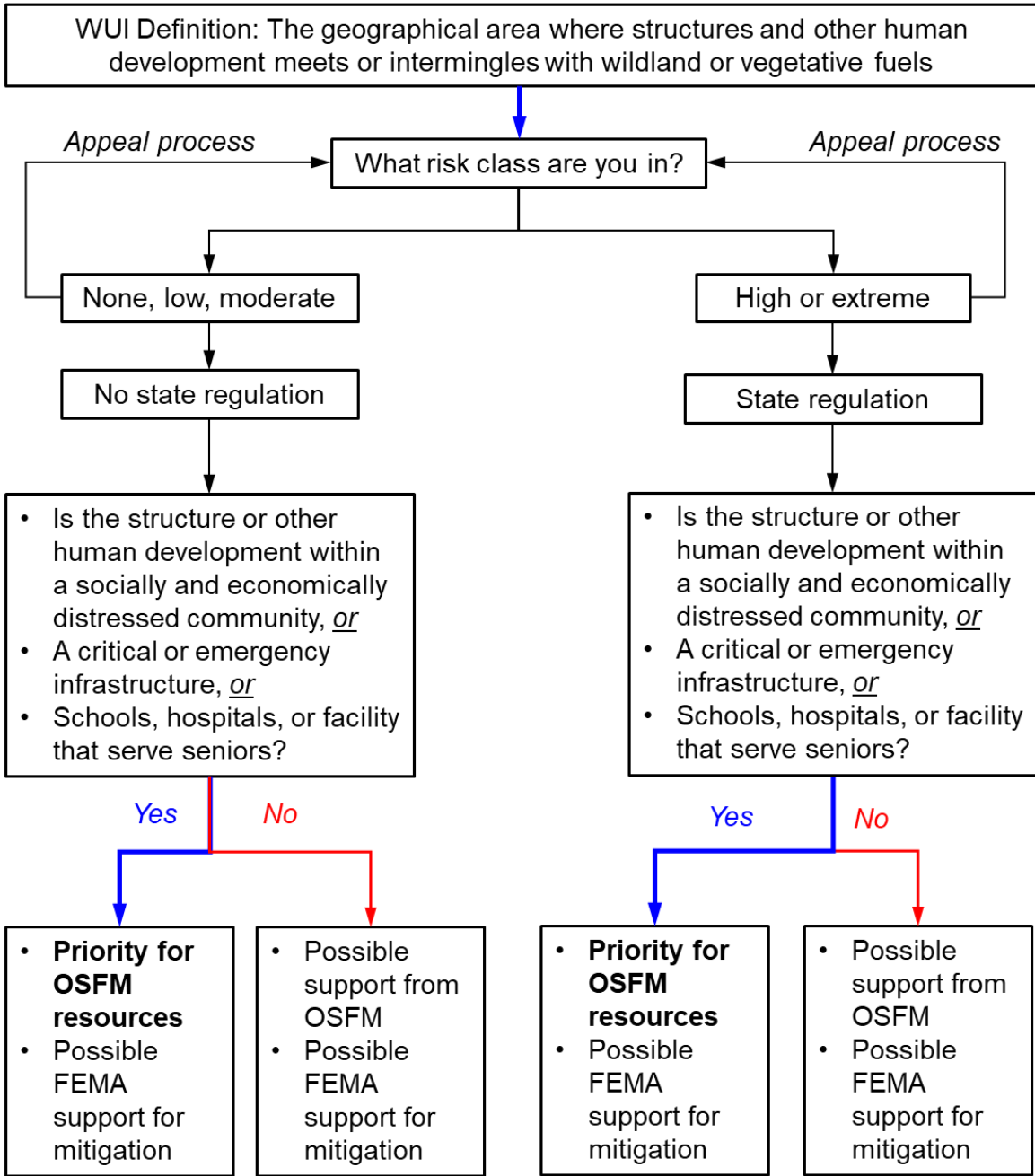
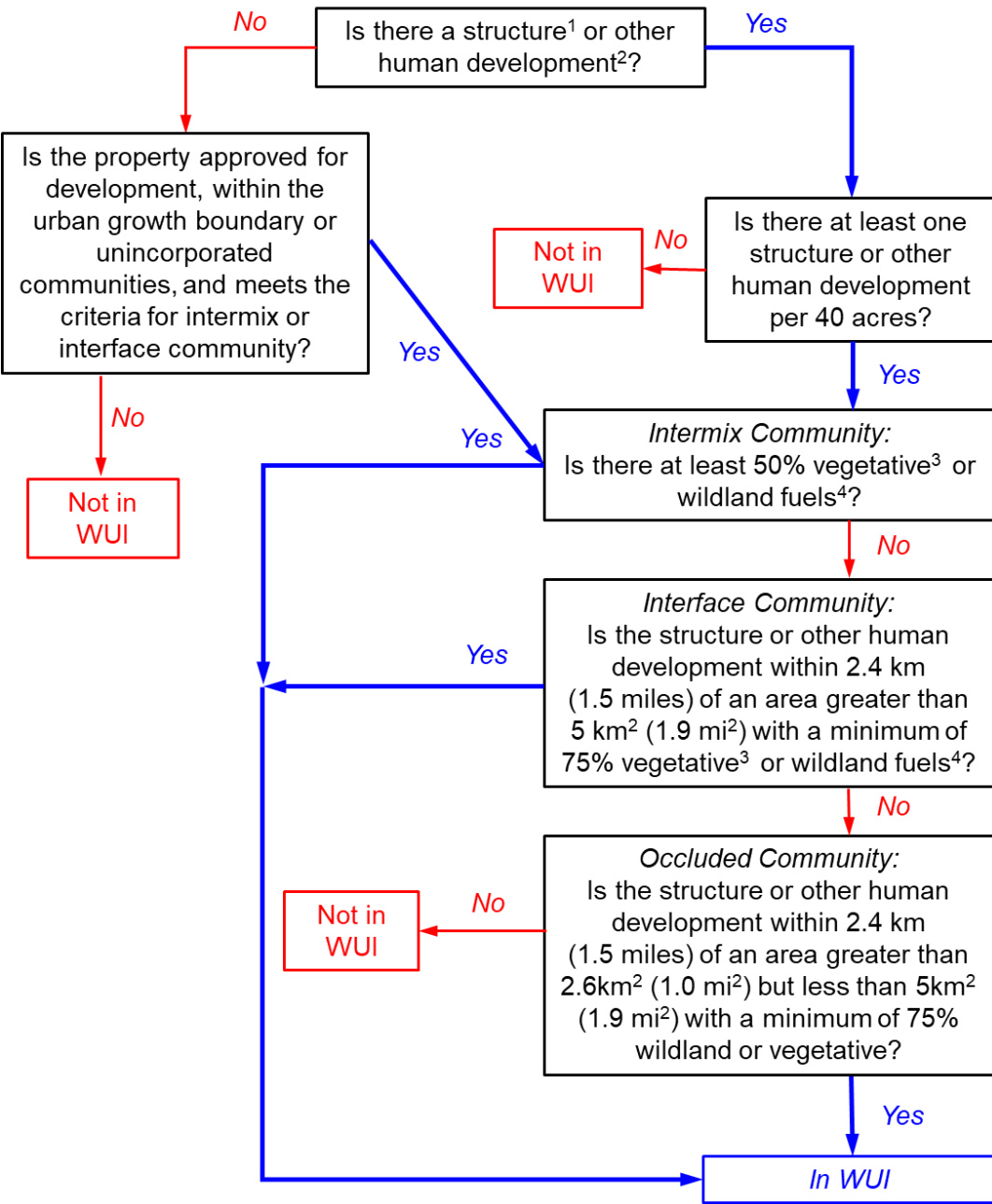


[Senate Bill 762](#) is comprehensive legislation passed with bipartisan support that will provide more than \$220 million to help Oregon modernize and improve wildfire preparedness through three key strategies: creating fire-adapted communities, developing safe and effective response, and increasing the resiliency of Oregon's landscapes. The bill is the product of years of hard work by the Governor's Wildfire Council, the Legislature, and state agencies.

Oregon's Adopted WUI Definition

“The geographical area where structures and other human development meets or intermingles with wildland or vegetative fuels”







Three phases of mapping

1. Mapping structure density across the State of Oregon
2. Mapping proximity to combustible vegetation
3. Assessing wildfire risk to structures

Is there a structure¹ or other human development²?

State Building Footprints of Oregon

- Improved upon Microsoft Building Footprints
 - Amalgamated best available data
- Estimated **2,171,335** structures in Oregon

Figure 2-1. SBFO building footprint primary data sources by county or city.



Is there a structure¹ or other human development²?

Remove building footprints
400 sq. ft. or less

- Deleted 222,519 structures
- **1,948,816** structures remain



Is there a structure¹ or other human development²?



One structure per tax lot

Intent is to prevent properties with multiple structures, such as farms and ranches, from being identified as WUI when that property is isolated from others

- Remove all but one structure per tax lot
 - Sort all points by unique tax lot ID (descending order by size, and then by tax lot ID)
 - Delete identical points based on unique tax lot ID
 - Removed **630,503** structures from dataset
 - **1,318,213** structures remain (equivalent to tax lots with structures)

Is there a structure¹ or other
human development²?

Other human development

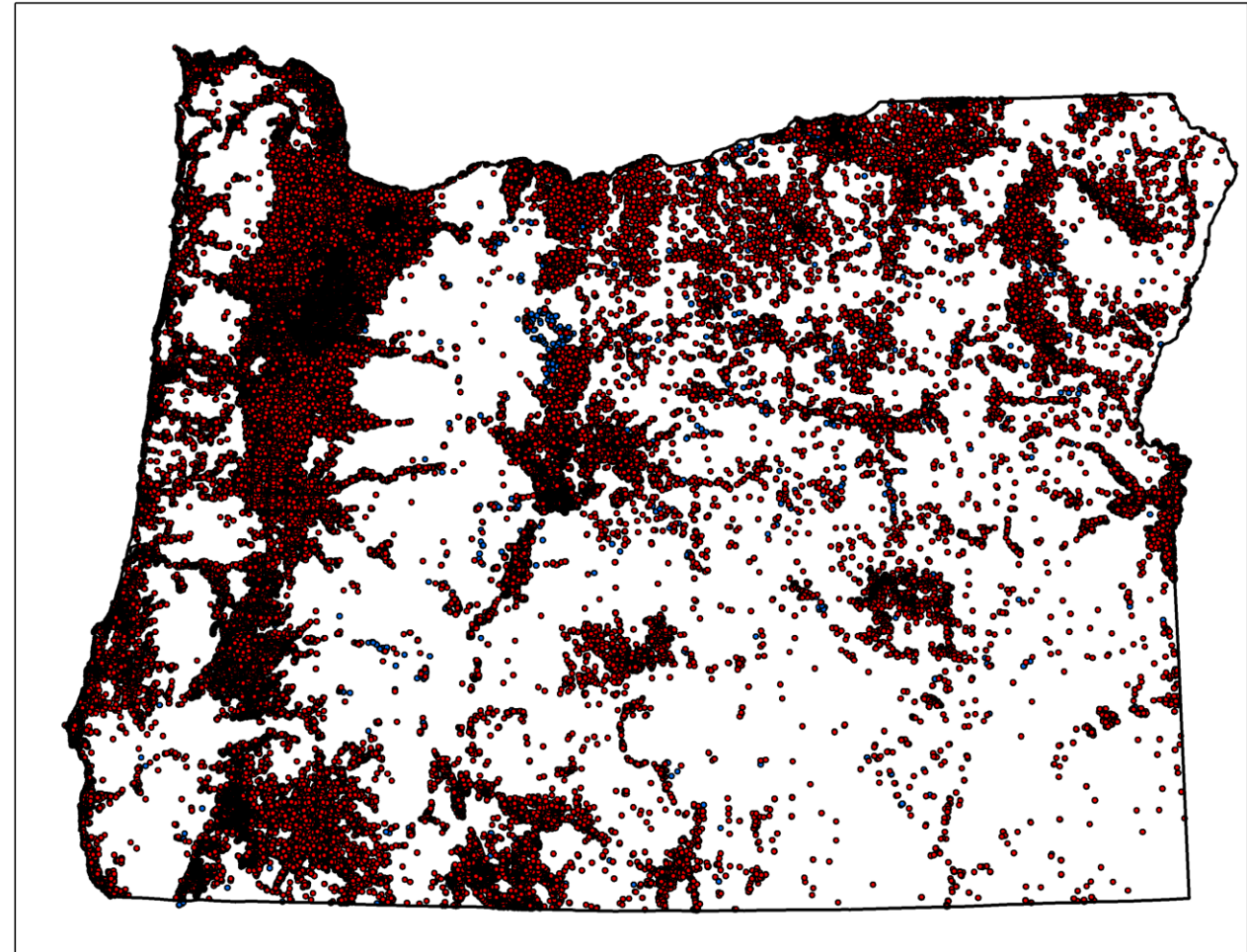
Defined as “essential facilities that support community functions, public communication, energy and transportation in excess of 400 square feet”.

Created a point data set to augment reduced structure data set using data from Homeland Security

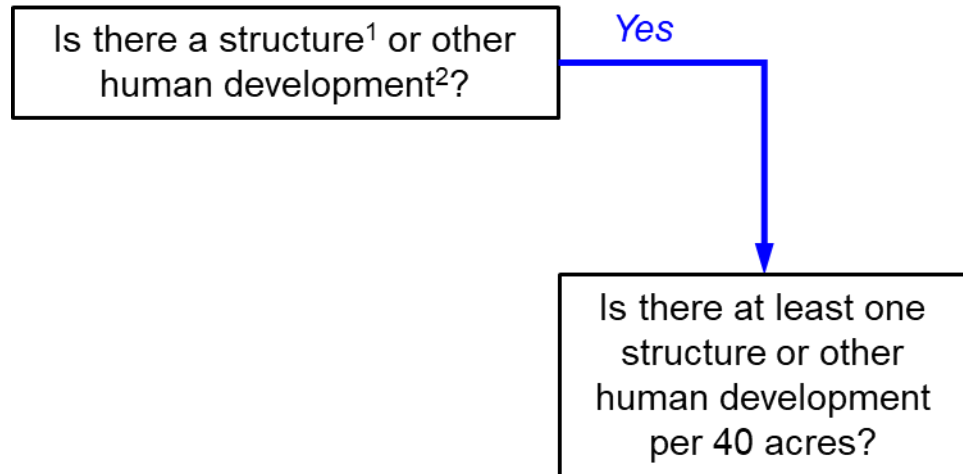
Remove all but one structure per tax lot

Added remaining points to overall structure dataset
A total of 1,651 additional points added

1,319,864 total structures in dataset







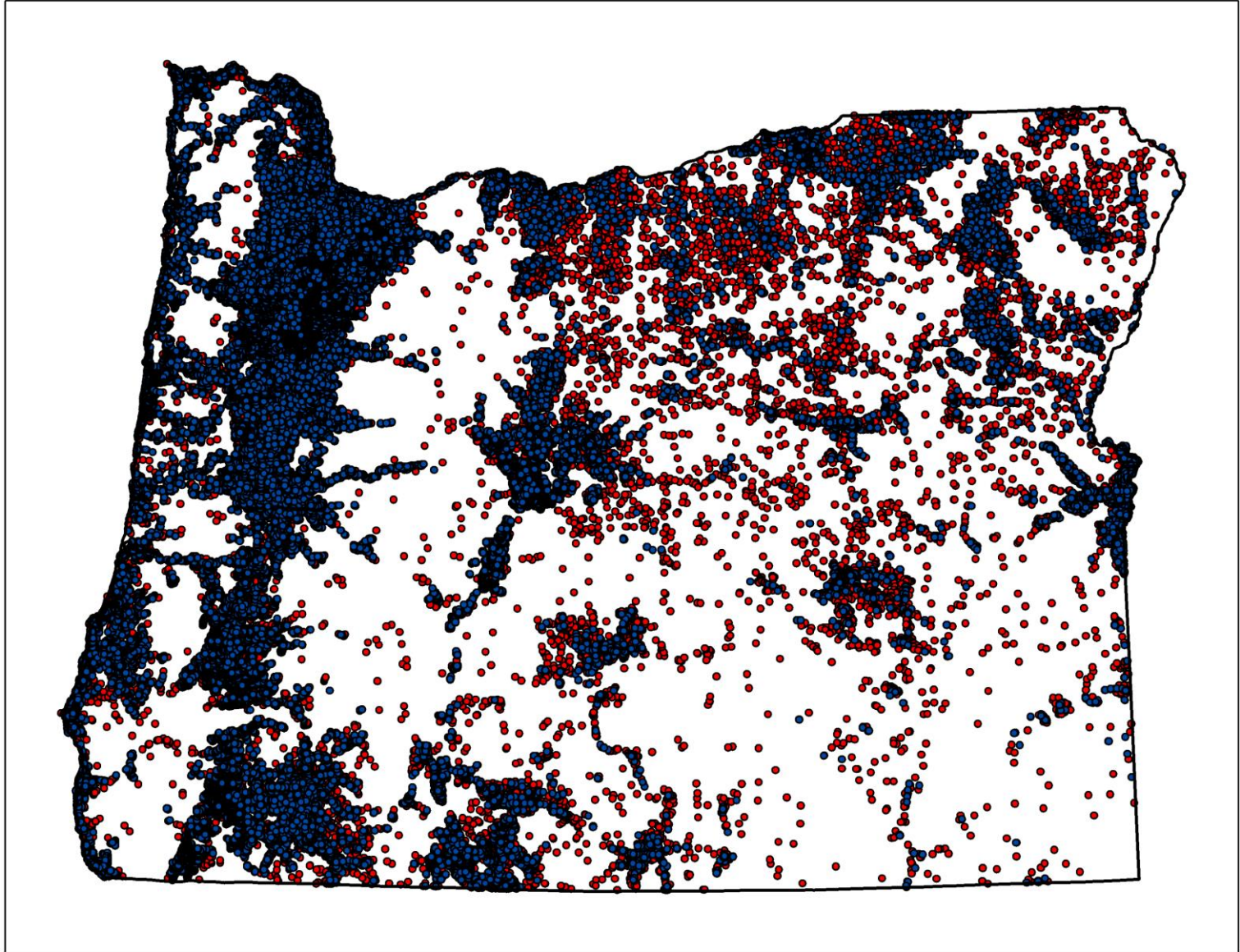
Maintain density threshold, but remove isolated properties

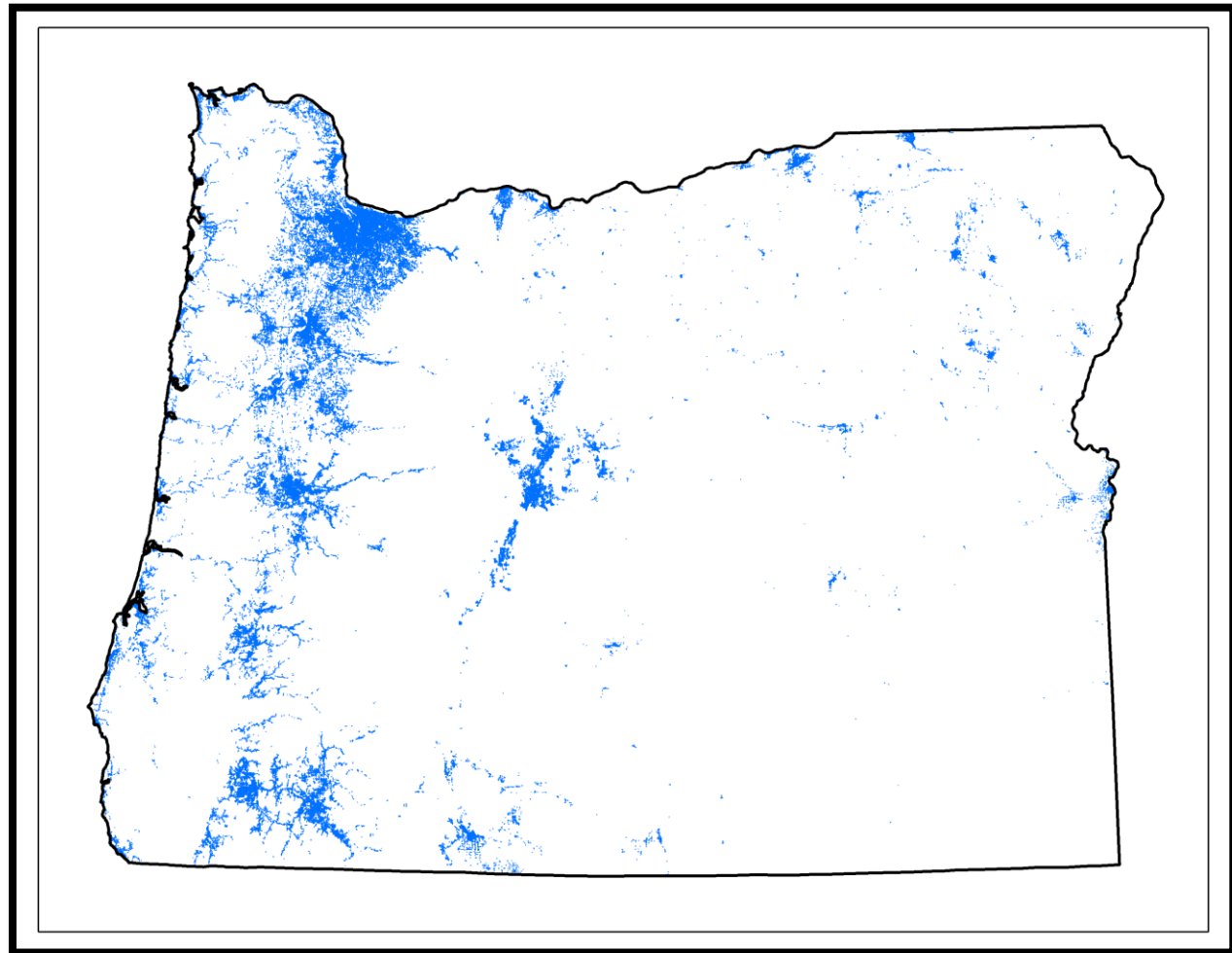
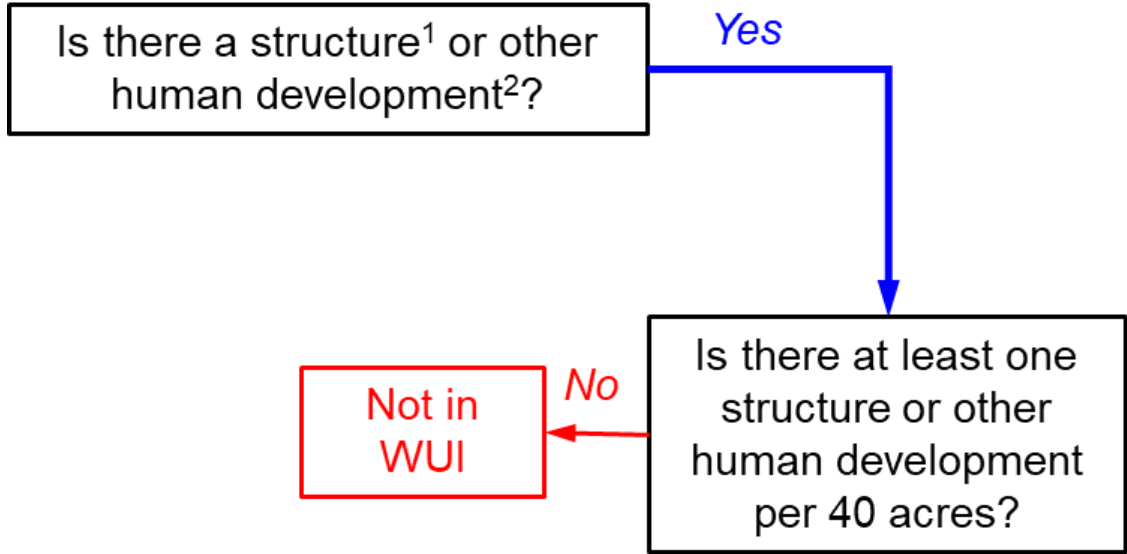
- 1/40 acre search radius is 744.73 ft
- To remove isolated properties, I quantified structure density (point density) with a search radius of 746 ft (40.14 acres) so that isolated properties had a density of 0.024915 structures/acre, which is just below the density threshold requirement of 0.025 structures/acre
- Deleted areas below threshold
- Removed 37,722 more structures from the dataset
- **1,282,142** structures remain

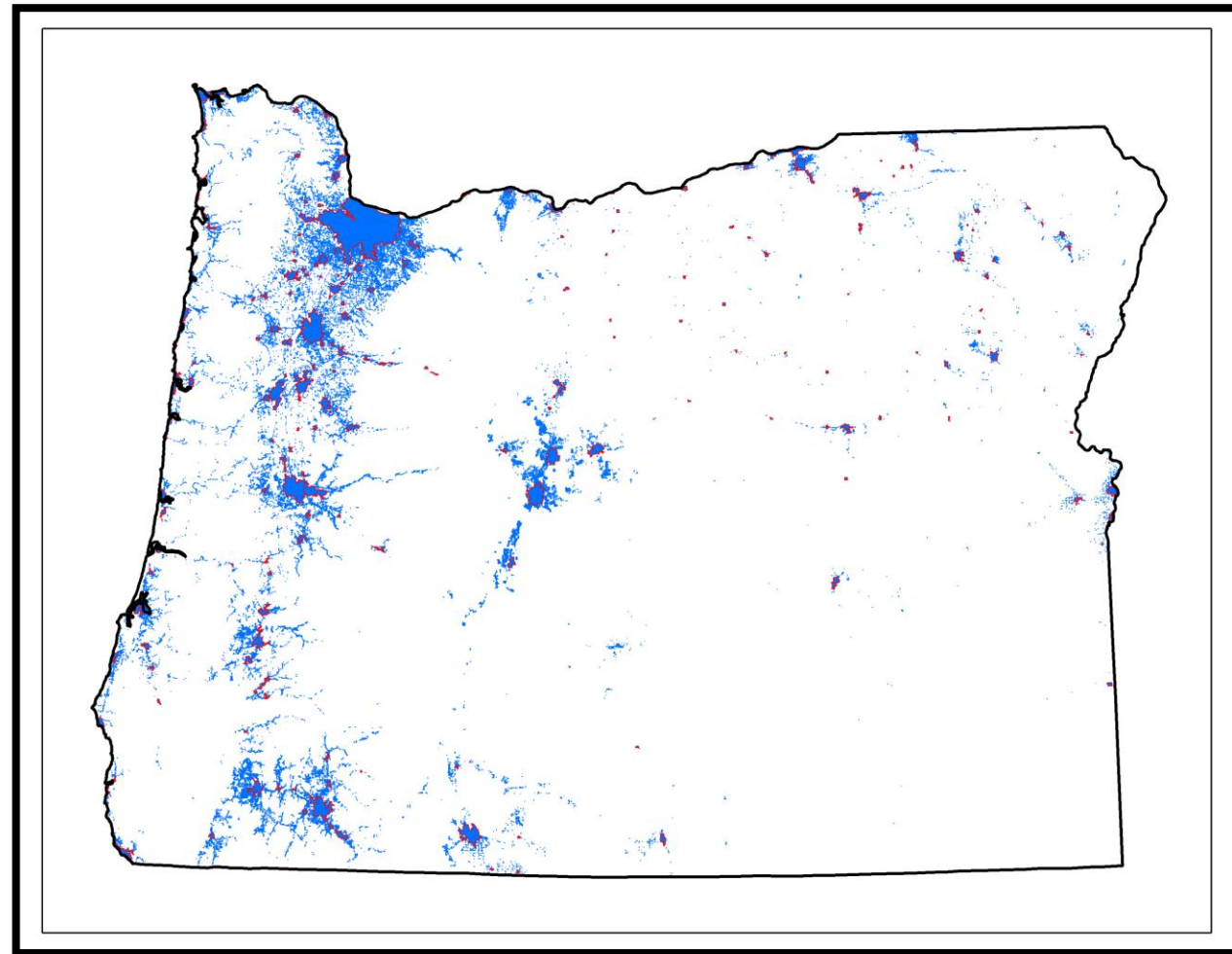
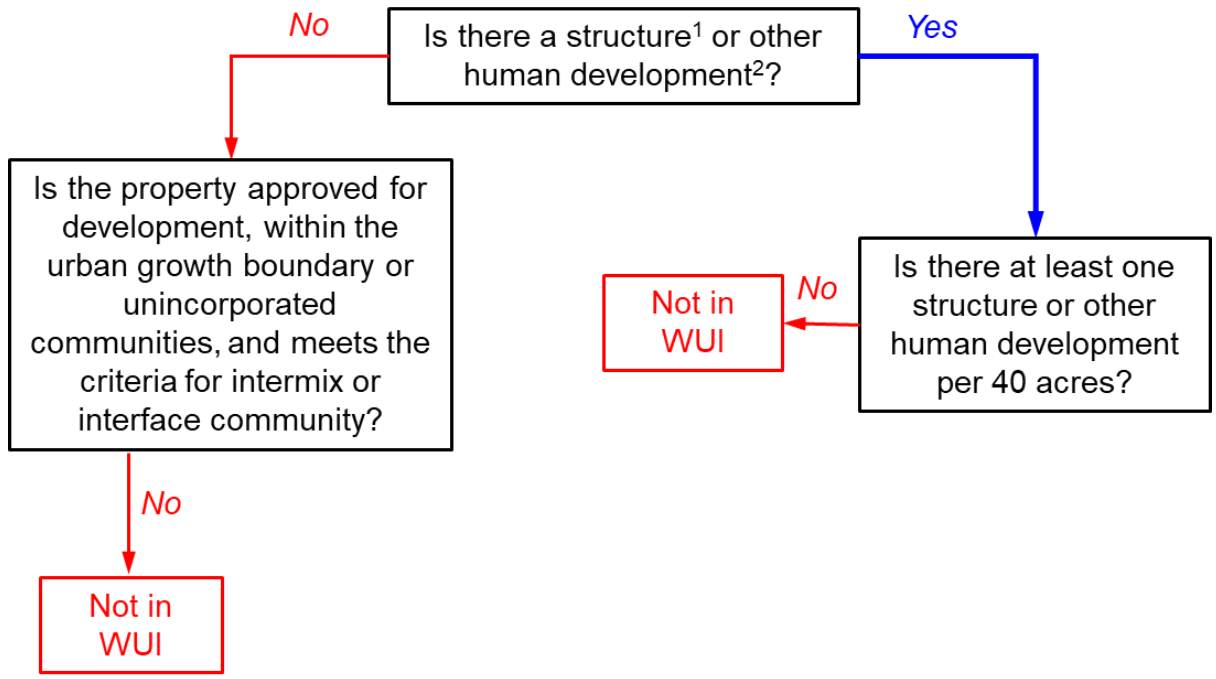
Is there a structure¹ or other human development²?

Yes

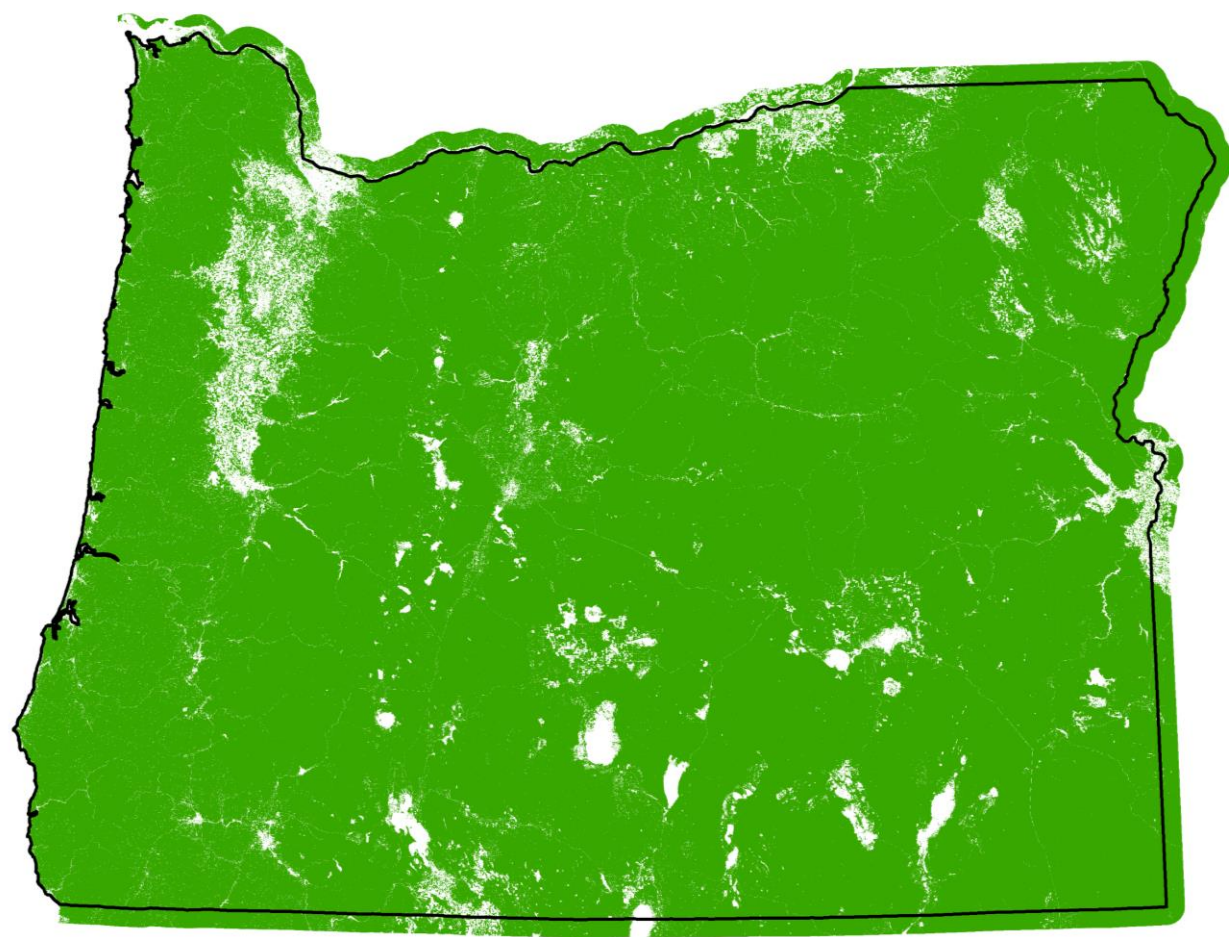
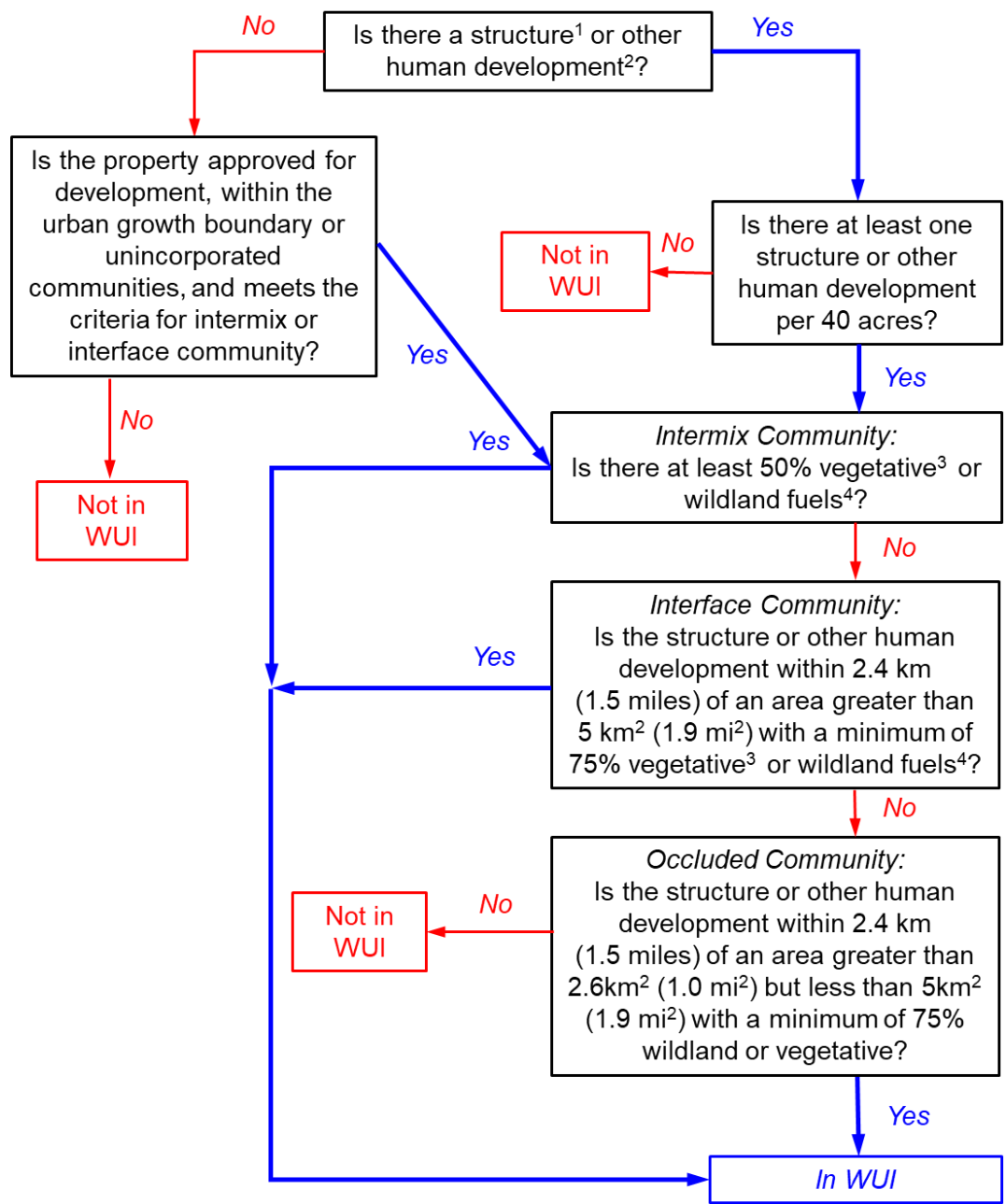
Is there at least one structure or other human development per 40 acres?

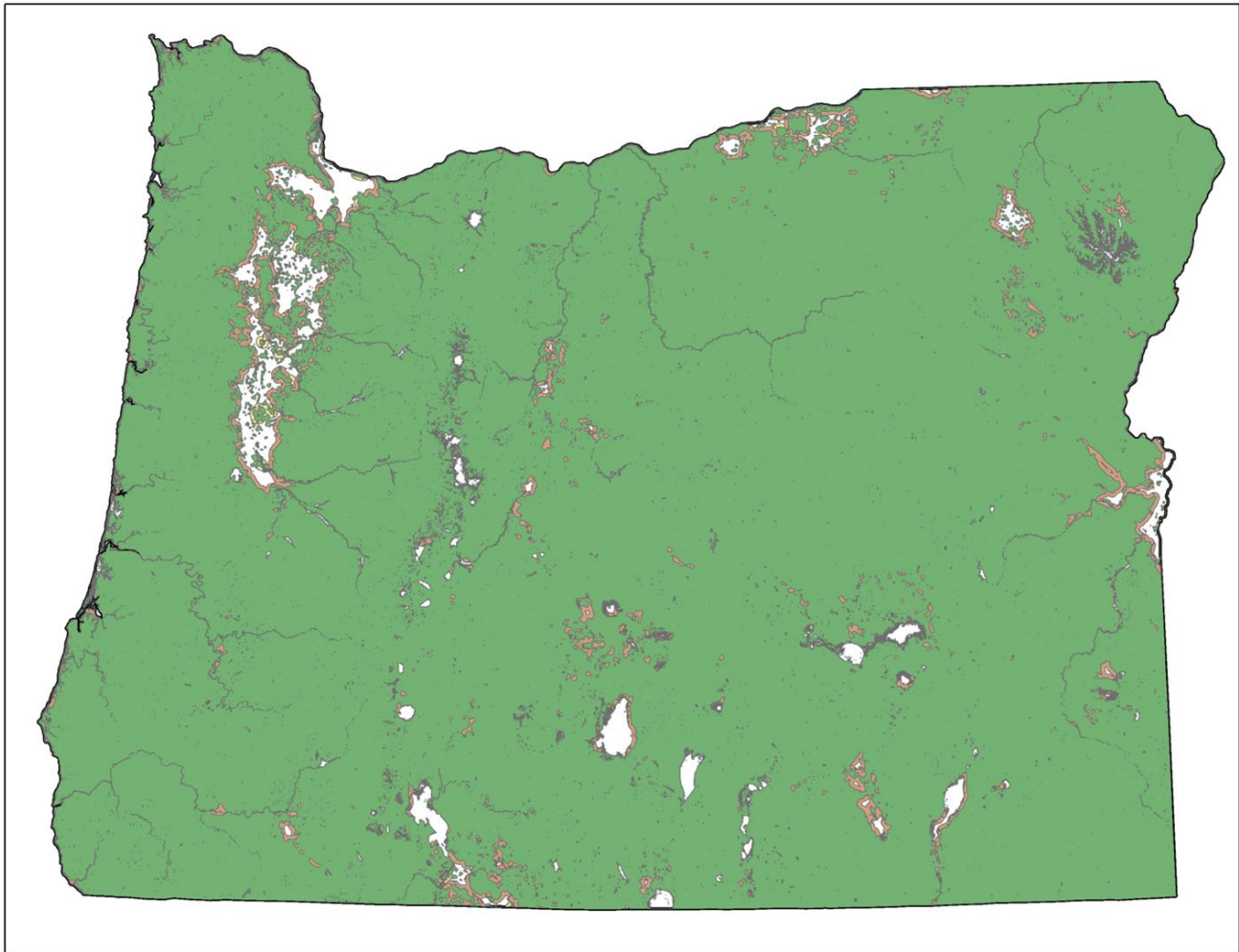
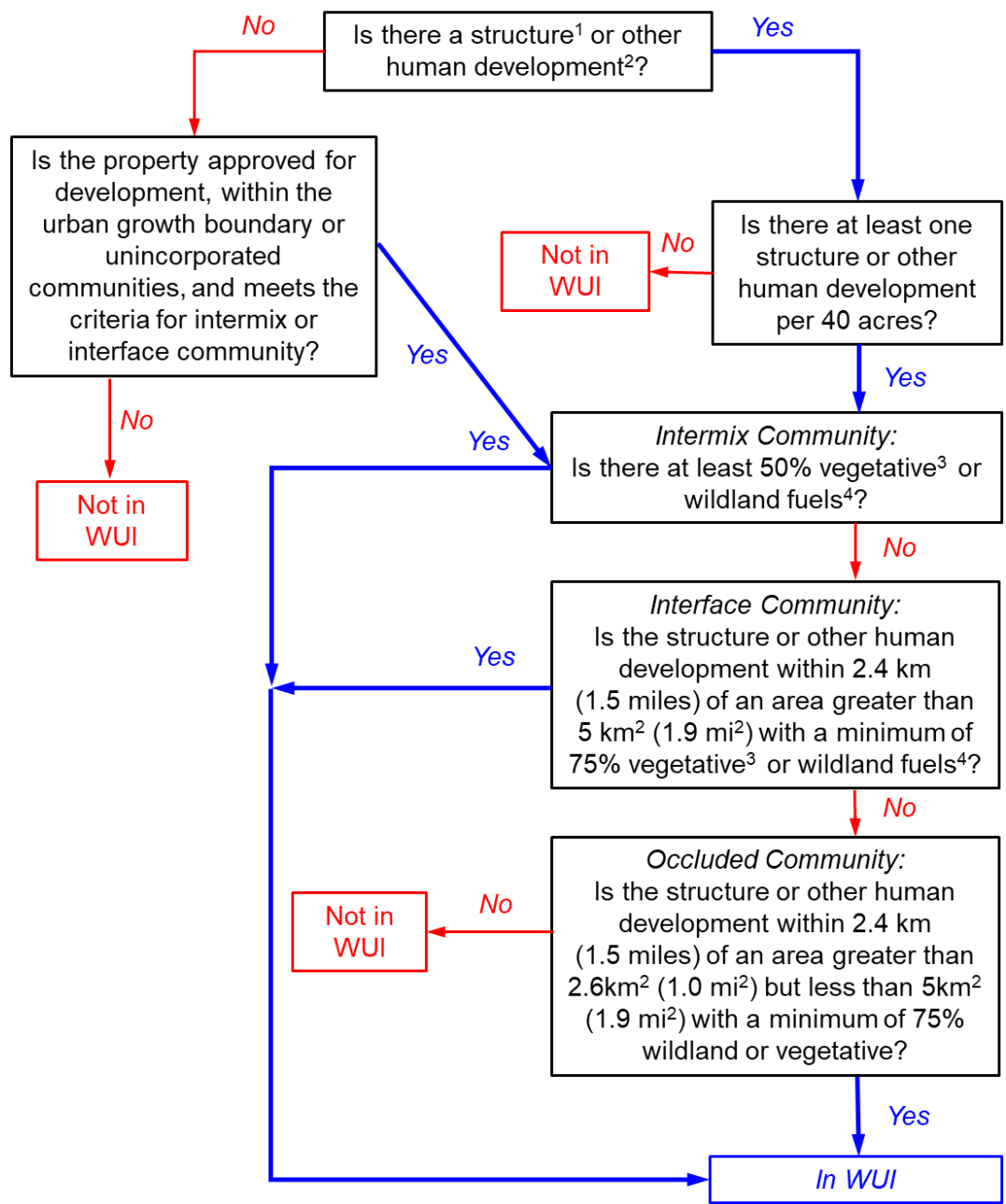


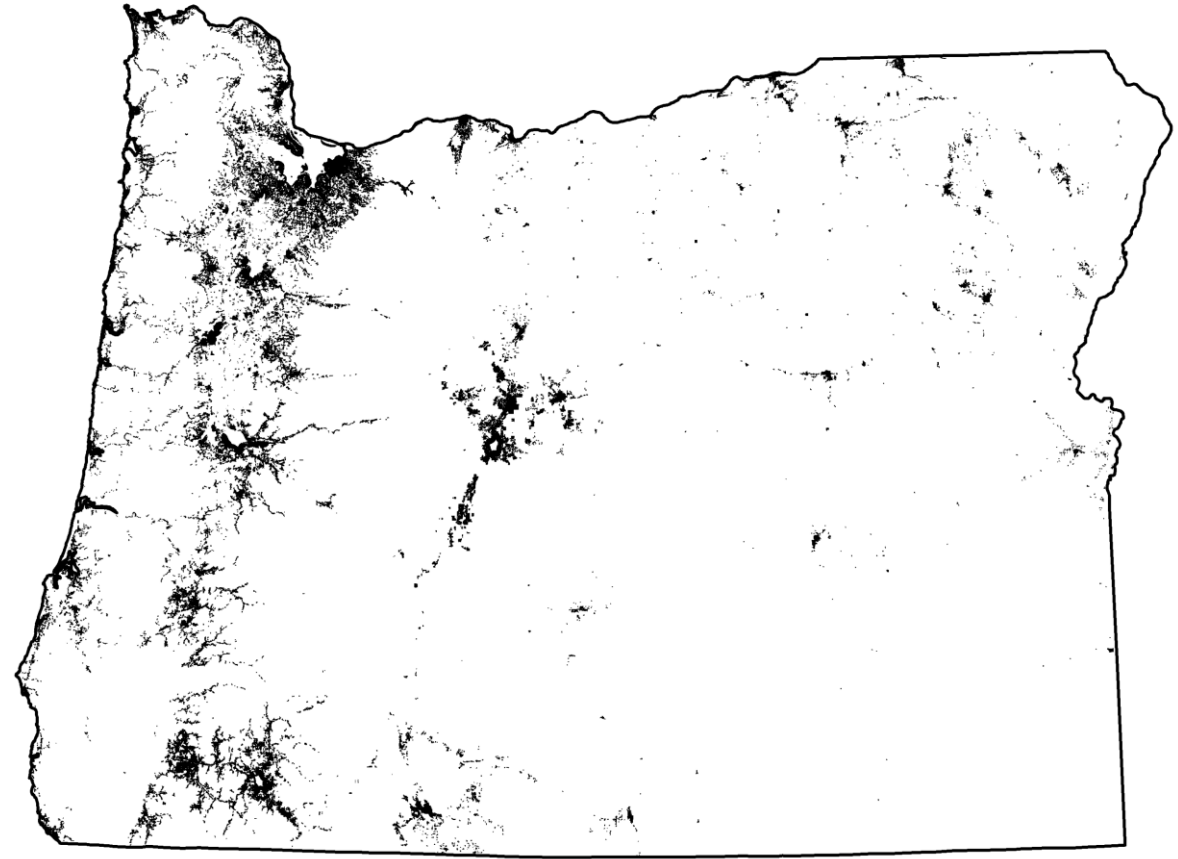
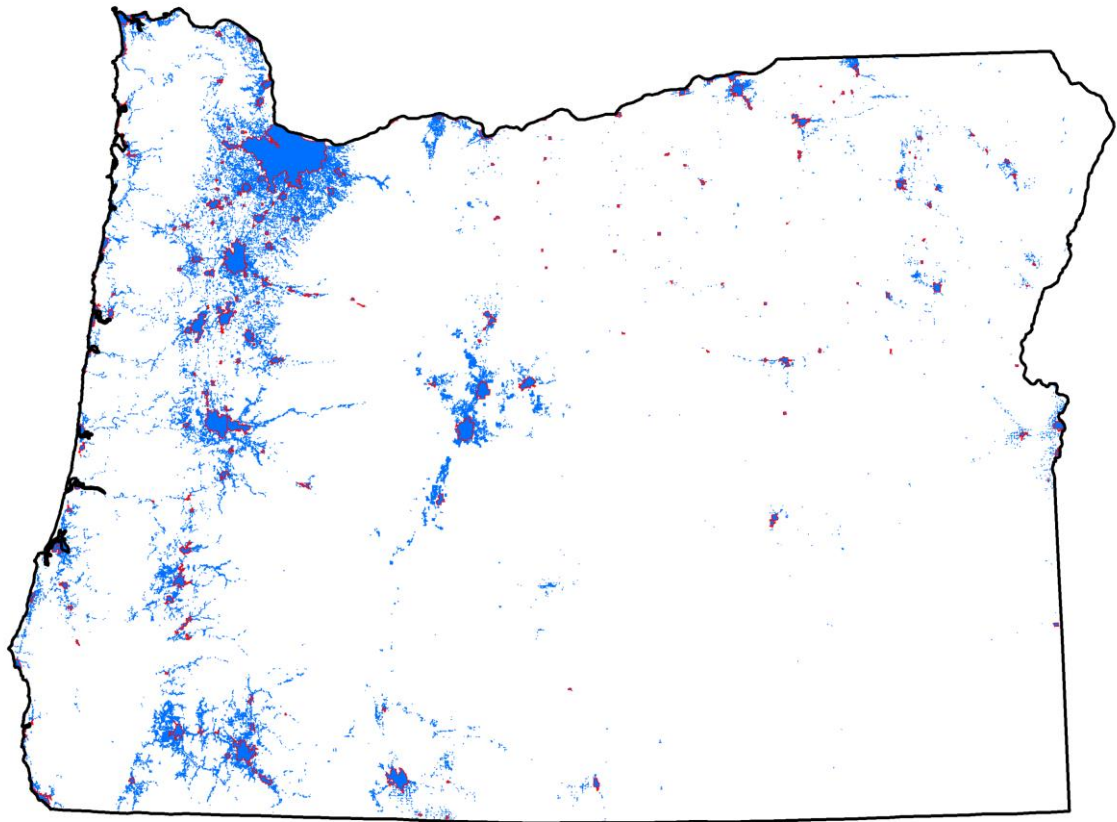




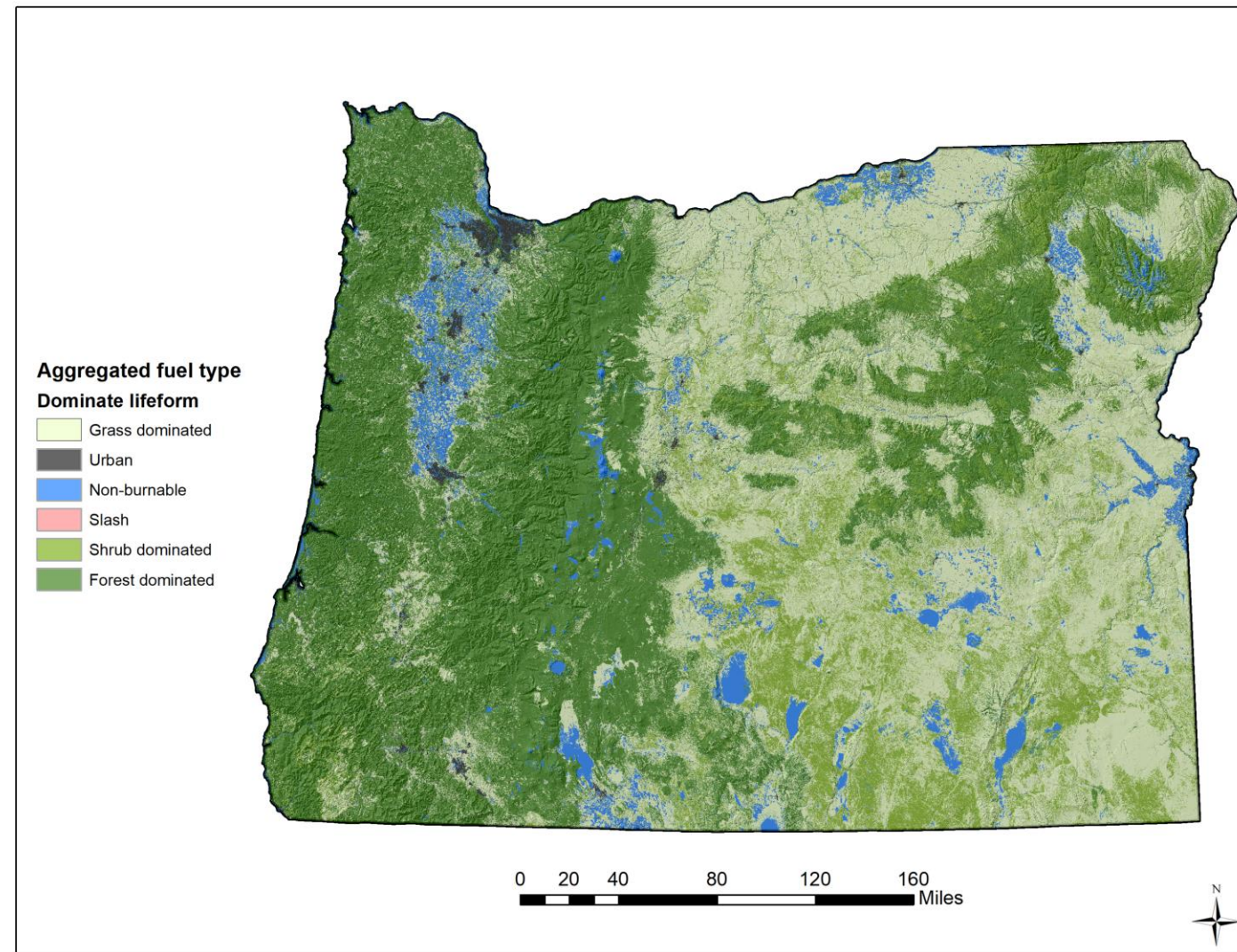
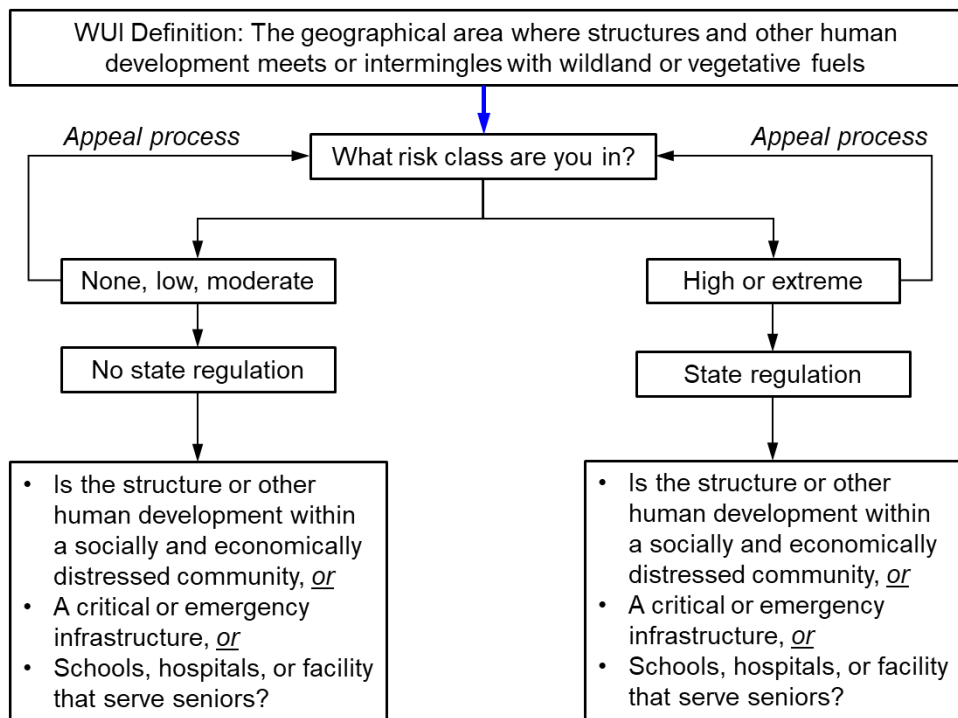
Retained 1,277,194 structures in dataset (UGB added 1,847 single property structures)



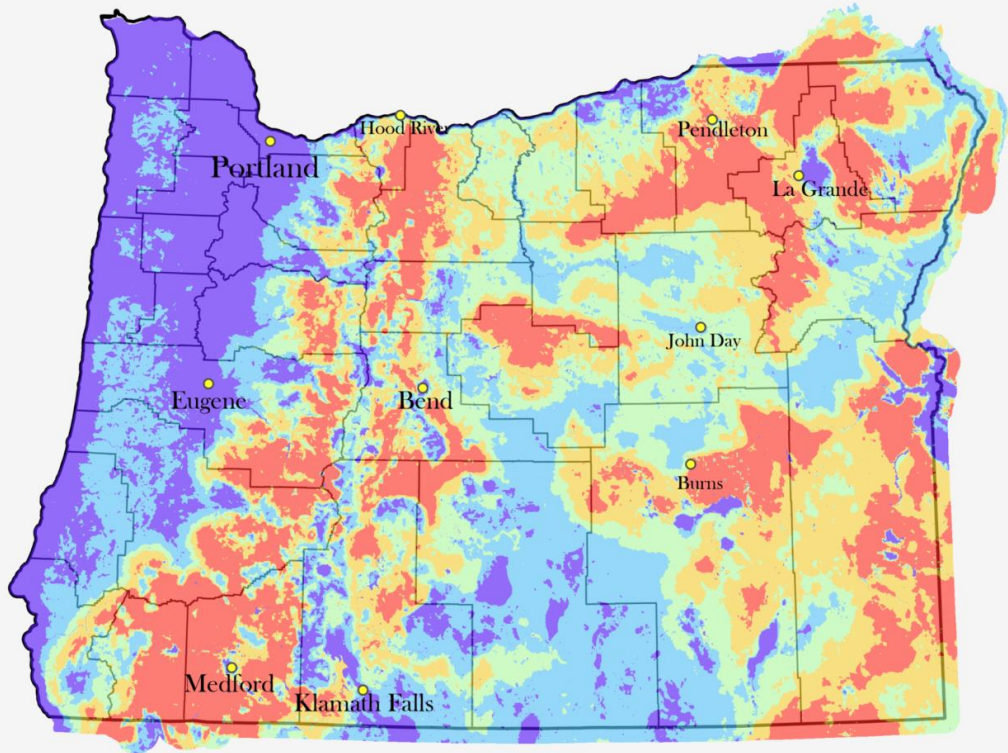




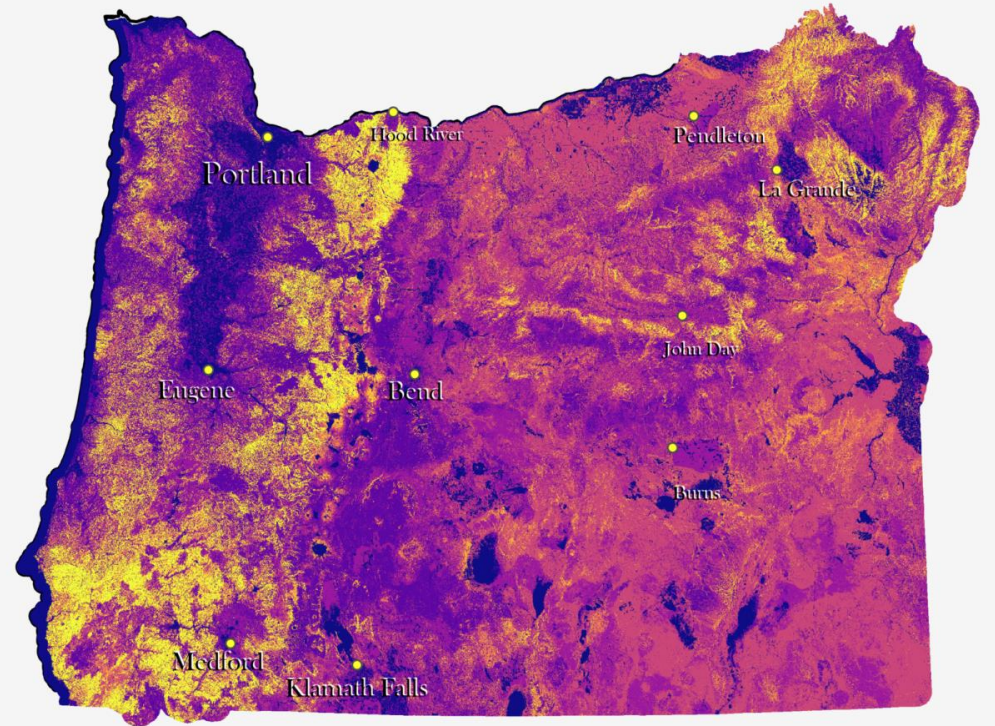
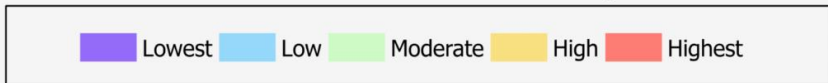
Wildfire risk



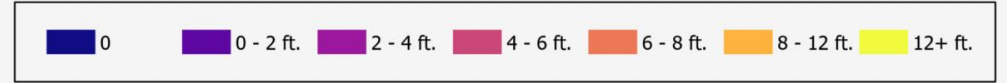
Burn probability



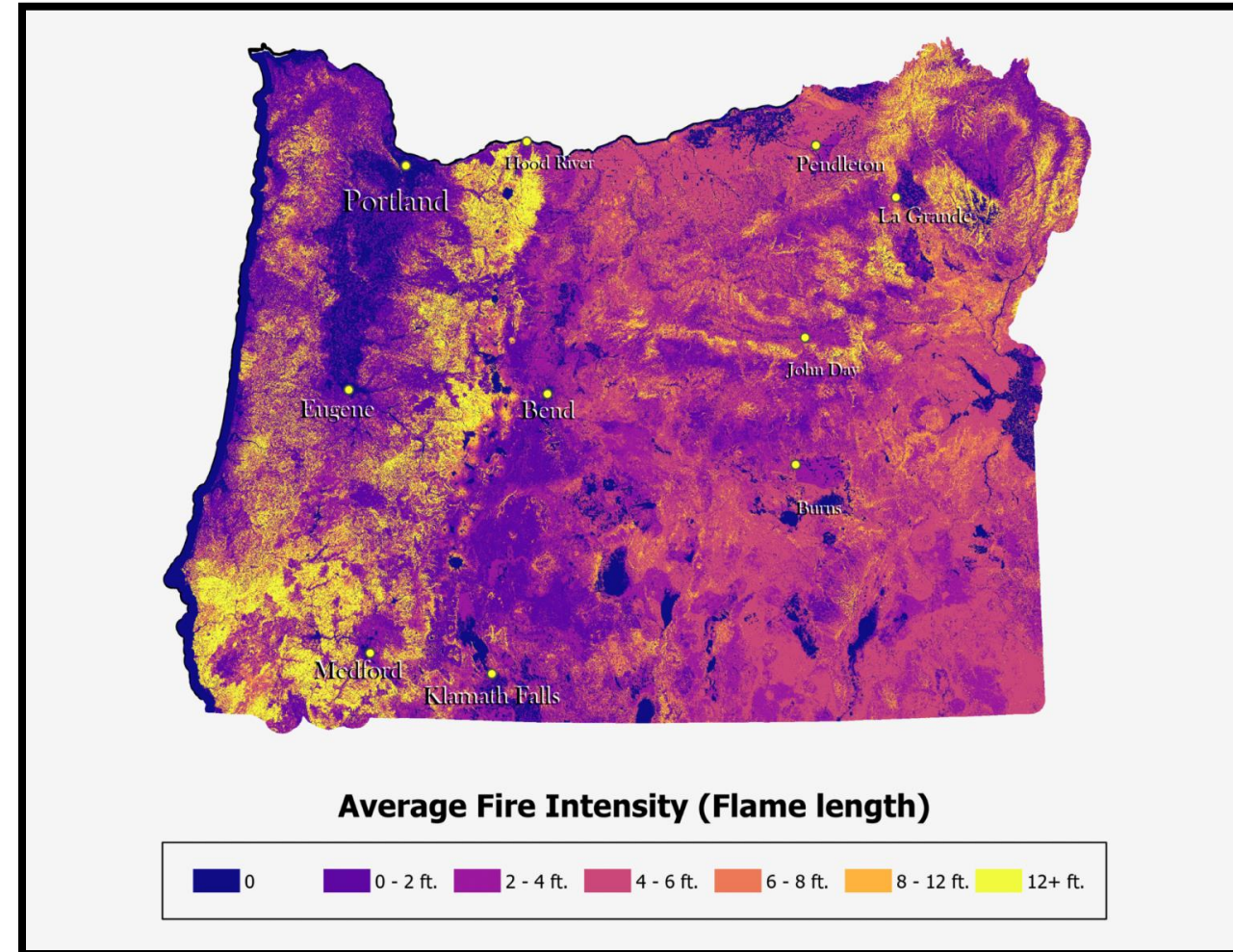
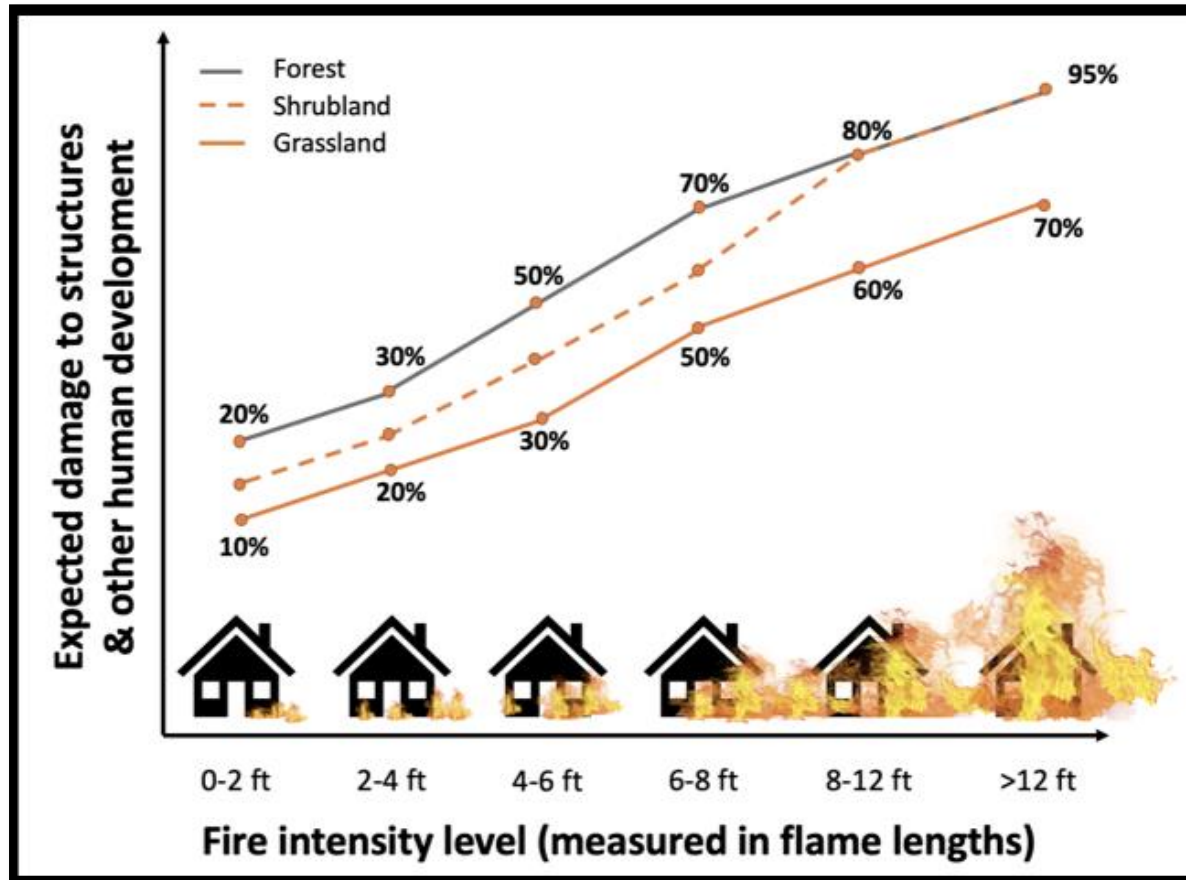
Annual Burn Probability



Average Fire Intensity (Flame length)

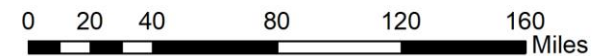
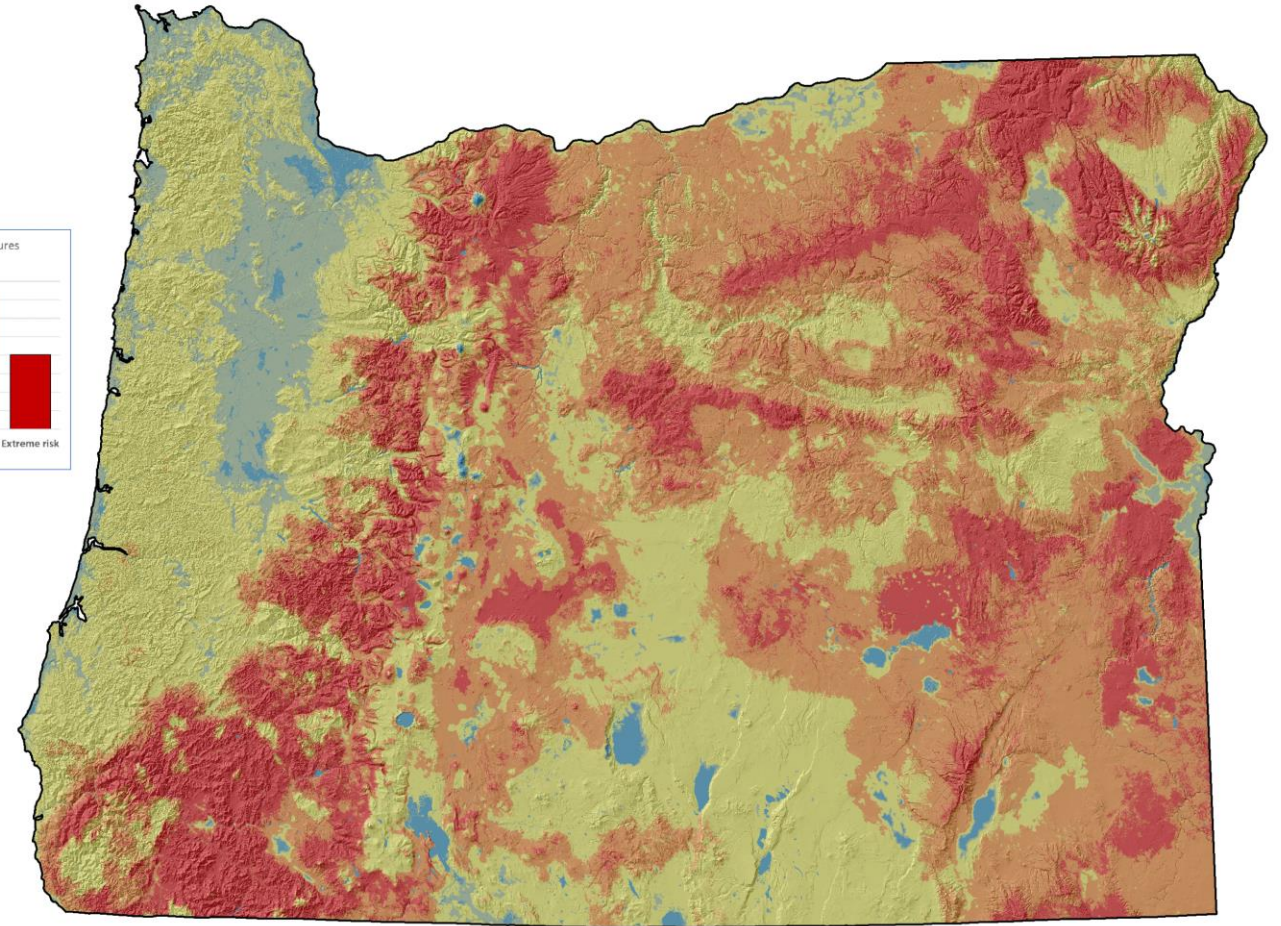
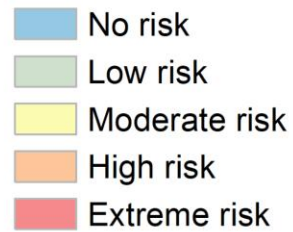
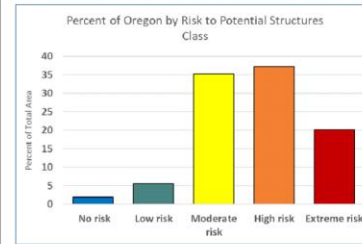


Potential consequences



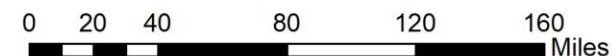
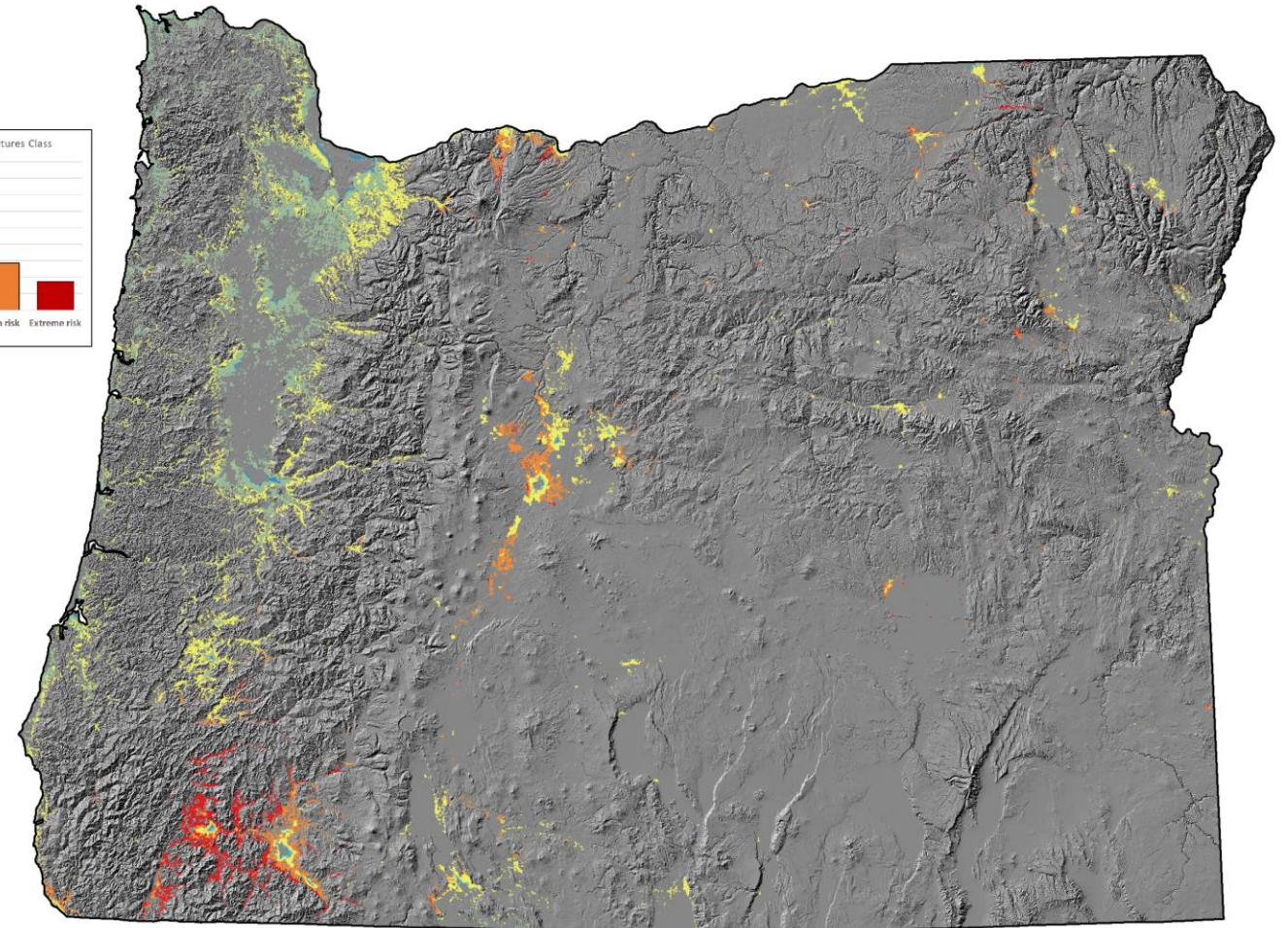
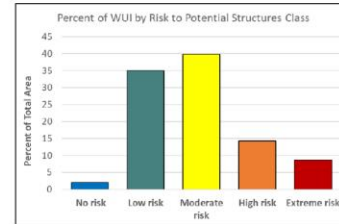
Risk classification

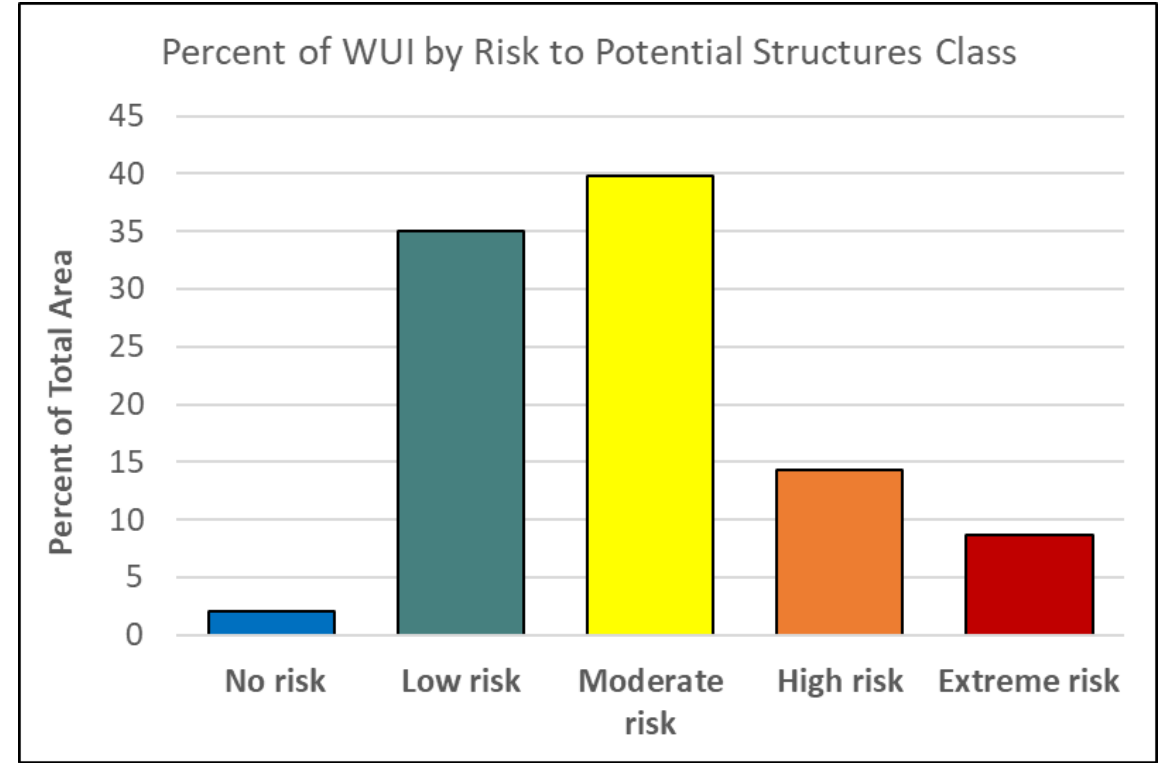
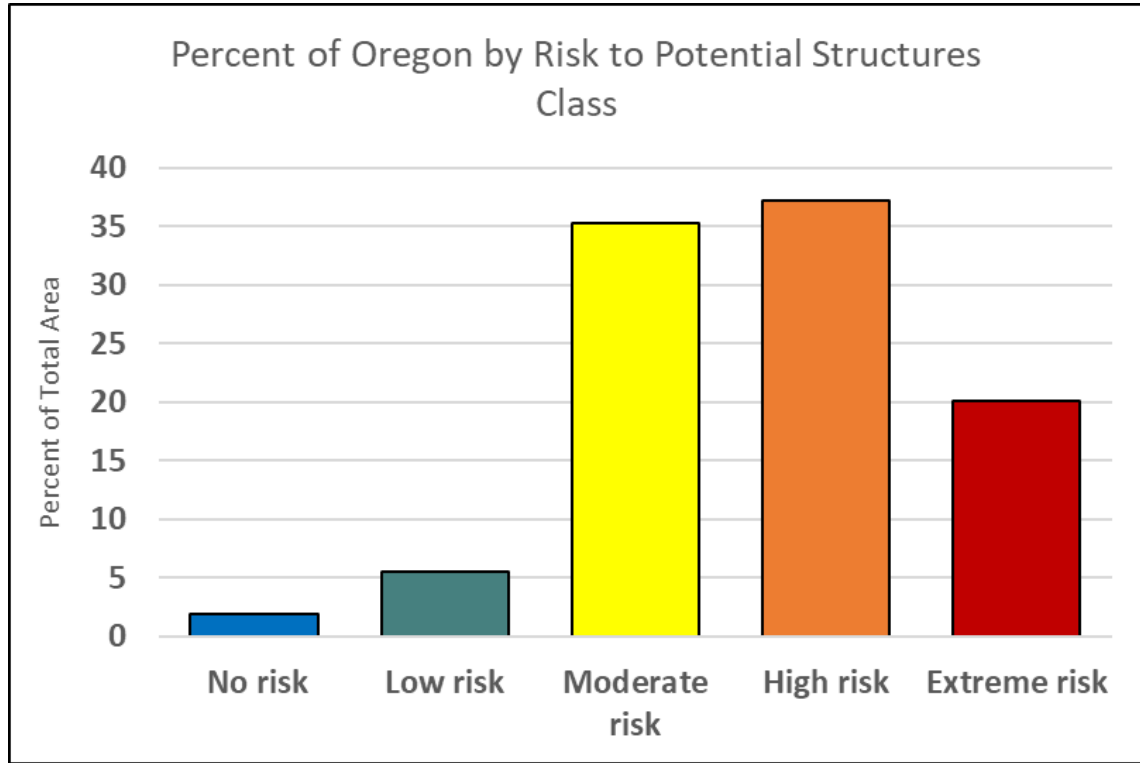
Oregon Risk To Potential Structures



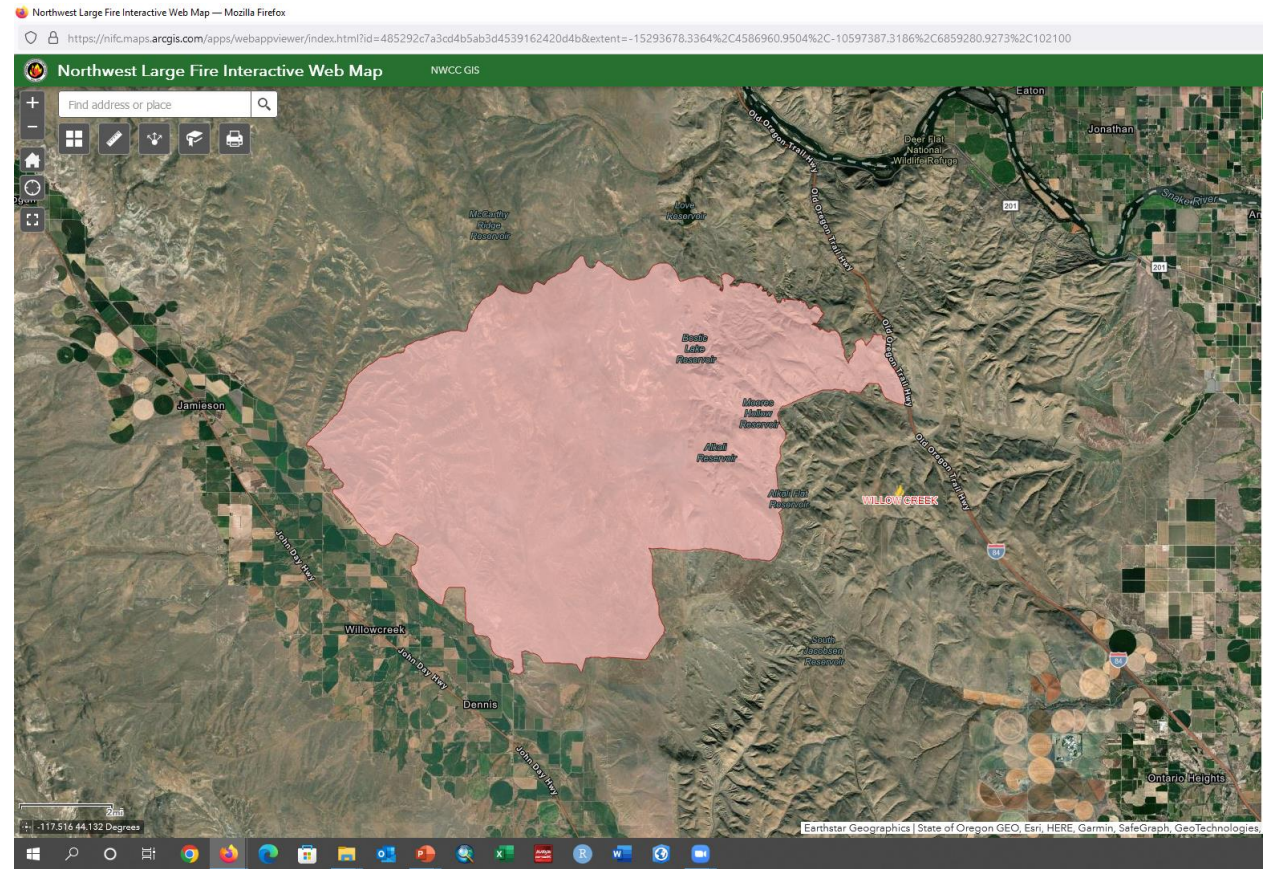
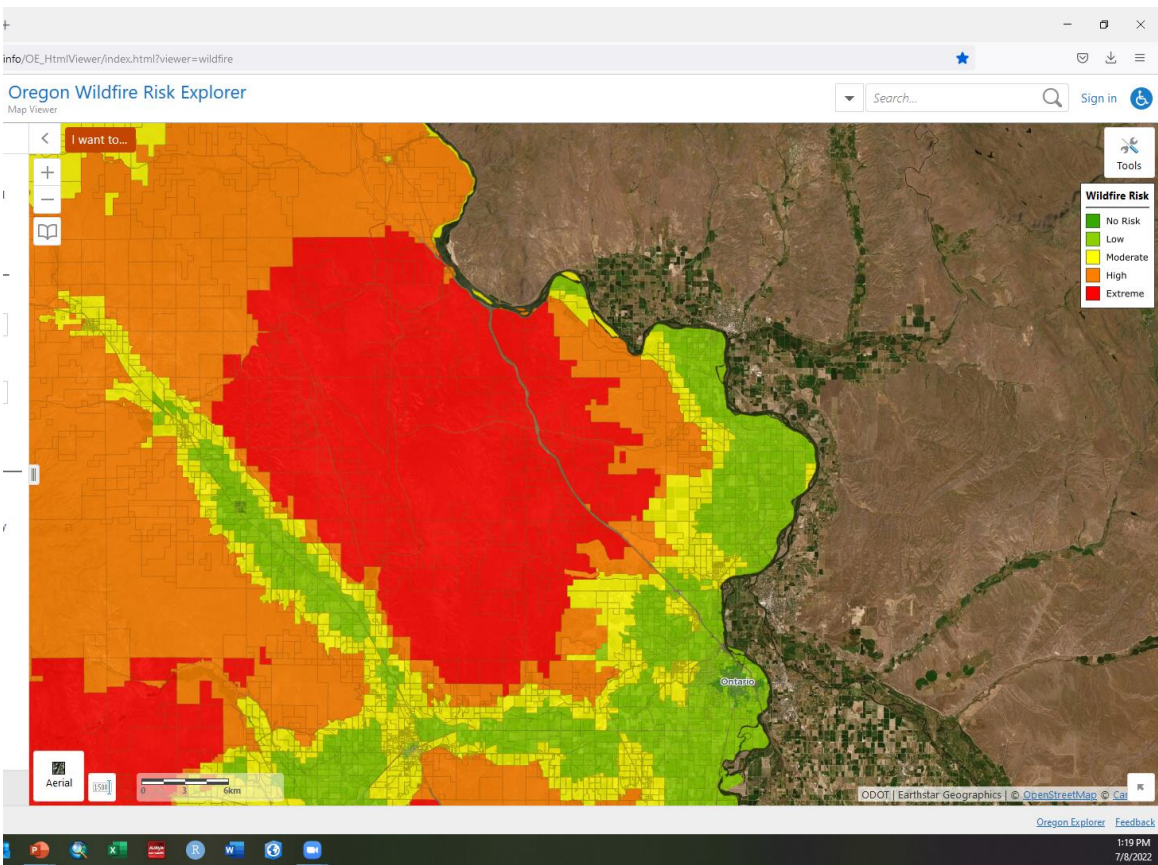
Risk classification

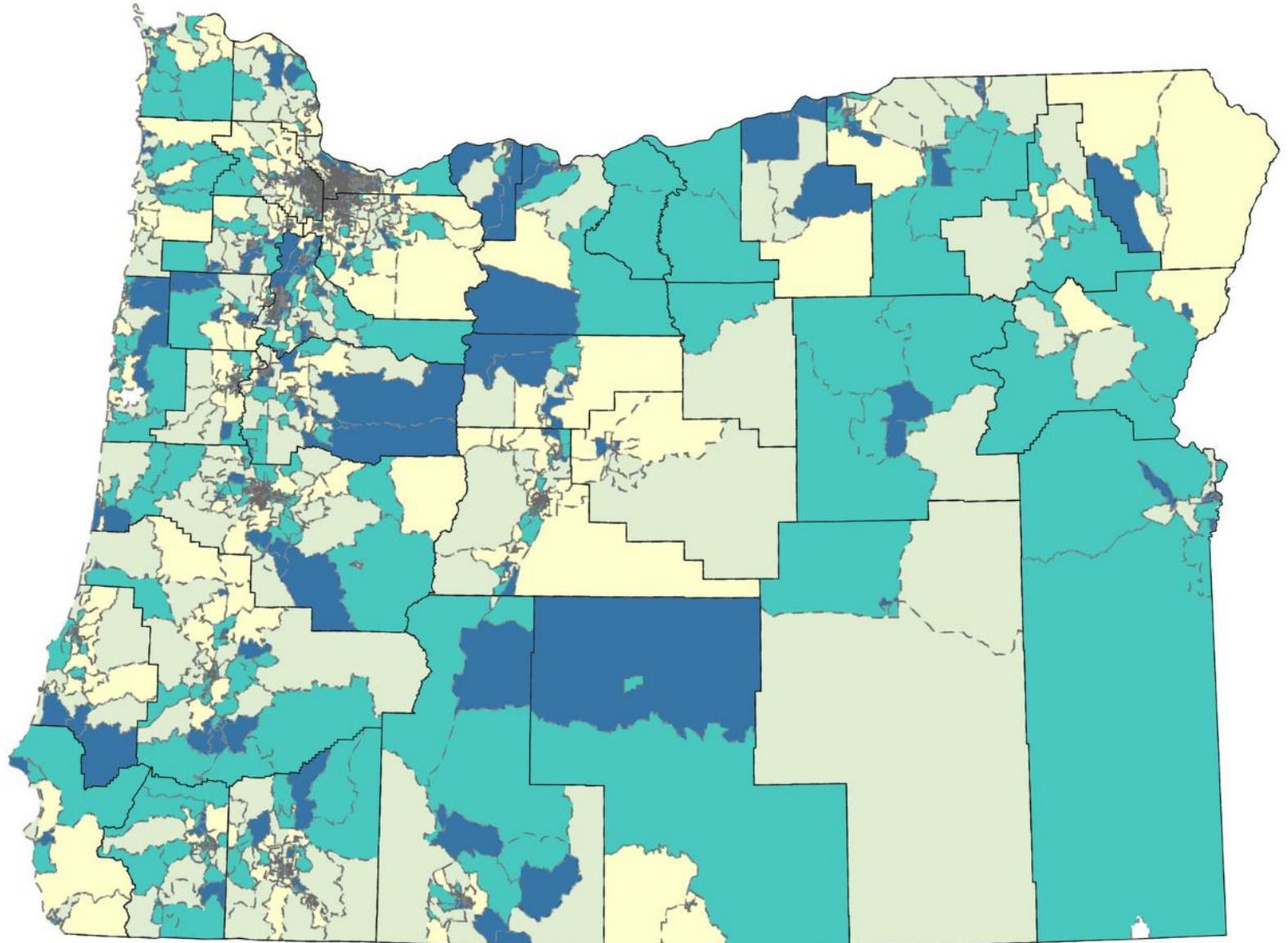
Oregon WUI Risk to Potential Structures









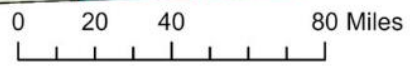
2022 Willowcreek Fire





Relative Social Vulnerability

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



Wildfire Risk

FORESTRY AND AGRICULTURE

- › Aquaculture
- › Century Farm and Ranch
- › Dairy and Poultry
- › Farming and Agriculture
- › Forest Collaboratives
- › Forest Management
- › Wildfire Risk

- INTRO
- ARTICLES & STORIES
- MAPS & TOOLS
- REPORTS & PUBS
- DATA
- MORE



The Oregon Wildfire Risk Explorer is designed to identify the wildland-urban interface and wildfire risk at the property ownership level. It shows a comprehensive view of wildfire risk within the State of Oregon, indicates local fire history, and offers additional resources.

Source: Oregon Department of Transportation, CC 2.0

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Oregon Department of Forestry



U.S. Forest Service



Oregon Wildfire Risk Explorer

View property level wildfire risk classification information and wildland urban interface status in a Homeowner's Report, create PDF maps, and view supporting data layers.



Oregon Defensible Space Code

Under Senate Bill 762, the Office of State Fire Marshal is mandated to adopt a statewide minimum defensible space code. Agencies, interest groups, and individuals are welcome to provide input during the adoption process.



Community Wildfire Protection Plans

Access Community Wildfire Protection Plans (CWPPs) and resources about plan development.



To view risk classification, click on the map, or enter an address or latitude/longitude

The screenshot displays the Oregon Wildfire Risk Explorer web application. The interface is divided into several sections:

- Header:** Features the "OREGON EXPLORER" logo, the Oregon and UAS logos, and the title "Oregon Wildfire Risk Explorer Map Viewer". A search bar with a magnifying glass icon and a "Sign in" button with a user icon are also present.
- Left Panel:**
 - Home:** A section with a description of the tool's purpose: "The Oregon Wildfire Risk Explorer is designed to identify the wildland urban interface and wildfire risk at the property ownership level. It shows a comprehensive view of wildfire risk within the State of Oregon, indicates local fire history, and offers additional resources. This site provides information regarding support for homeowners, communities, and professionals to identify and prioritize local wildfire prevention, mitigation efforts, and implement defensible space standards where applicable."
 - Search by address:** A text input field with the placeholder "Start typing a value".
 - Search by lat/long:** A text input field with the placeholder "Lat/Long: 44.59564N 123.41766W". A blue arrow points to this section from the left.
 - Buttons:** "Clear" and "Submit >>" buttons are located below the search fields.
 - Disclaimer:** A paragraph stating: "The Oregon Wildfire Risk Explorer is a partnership among Oregon Department of Forestry, Oregon State University Institute for Natural Resources, OSU Libraries and Press, the US Forest Service, and a wide variety of stakeholders throughout Oregon. For technical questions about the risk map contact osuwildfirerisk@oregonstate.edu. Statewide Wildfire Risk Map Effective Date: 6/30/2022 The user assumes the entire responsibility and liability related to their use of this information. By accessing this website and/or data contained within, you hereby release the Oregon Department of Forestry, Oregon State University, Oregon State University Libraries and Press and all data providers from liability. This institution is an equal opportunity provider."
 - Navigation:** "Layers" and "Home" buttons are at the bottom left.
- Map Area:** A central map of Oregon showing wildfire risk classification. The map uses a color scale from green (low risk) to red (high risk). Major cities like Vancouver, Portland, Salem, Albany, Eugene, Bend, Medford, Yakima, Richland, Walla Walla, Lewiston, and Boise are labeled. A blue arrow points to the northern part of the map near Yakima. A "Tools" button is in the top right corner.
- Footer:** Includes "Basemaps" and "1500" scale indicators, a scale bar (0, 50, 100km), and copyright information: "ODOT | Earthstar Geographics | © OpenStreetMap © Car".



Home

The Oregon Wildfire Risk Explorer is designed to identify the wildland urban interface and wildfire risk at the property ownership level. It shows a comprehensive view of wildfire risk within the State of Oregon, indicates local fire history, and offers additional resources. This site provides information regarding support for homeowners, communities, and professionals to identify and prioritize local wildfire prevention, mitigation efforts, and implement defensible space standards where applicable.

Search by address

Start typing a value

Search by lat/long

Lat/Long: 44.59564N 123.41766W

Clear Submit >>

The Oregon Wildfire Risk Explorer is a partnership among Oregon Department of Forestry, Oregon State University Institute for Natural Resources, OSU Libraries and Press, the US Forest Service, and a wide variety of stakeholders throughout Oregon.

For technical questions about the risk map contact osuwildfirerisk@oregonstate.edu.

Statewide Wildfire Risk Map Effective Date: 6/30/2022 The user assumes the entire responsibility and liability related to their use of this information. By accessing this website and/or data contained within, you hereby release the Oregon Department of Forestry, Oregon State University, Oregon State University Libraries and Press and all data providers from liability. This institution is an equal opportunity provider.

Layers Home

I want to...

☆ Wildfire Risk Classification

Wildfire Risk Classification: **Moderate**

Within Wildland Urban Interface Boundary: **No**

Risk Value: **0.004**

Generate Homeowner's Report

Additional Resources

- [Oregon Department of Forestry](#)
- [ODF Mapping and WUI Information](#)
- [ODF Appeals Information](#)
- [Community Wildfire Protection Plans](#)

Legend

- No Risk
- Low
- Moderate
- High
- Extreme

[Add to Results](#) | [View Additional Details](#)

Click to generate PDF report

Basemaps

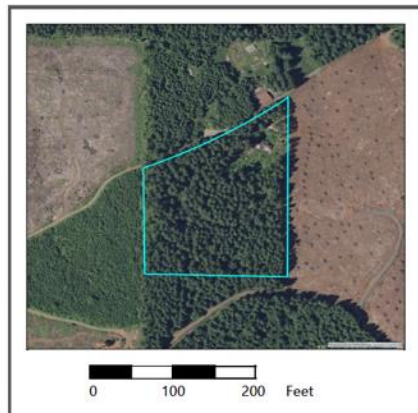
0 100 200m



Oregon Wildfire Risk Explorer - Homeowner's Report



Report Date: June 30, 2022



Your tax lot's wildfire risk classification and WUI status was determined pursuant to ORS 477.490 and OAR 629-044-1000 to 1041. Your risk rating has been identified through an official rulemaking process and can be found in OAR 629-044-1020 to OAR 629-044-1025. More general information can be found on the [ODF Senate Bill 762 webpage](#).

Nearly all areas in Oregon experience some level of wildfire risk. Conditions vary widely with local topography, fuels, and 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 fire effects. Be aware of ember travel or spot fire potential from fires anywhere there are burnable fuels nearby.

RESOURCES

[Oregon Department of Forestry](#)

- [ODF Mapping and WUI Information](#)
- [ODF Appeals Information](#)
- [Community Wildfire Protection Plans](#)

[Oregon Office of the State Fire Marshal](#)

- [Oregon Defensible Space Code](#)

[Oregon Department of Consumer and Business Services Building Codes Division](#)

[OSU Extension](#)
[OSU Wildfire Risk Mapping](#)
[Senate Bill 762](#)

Statewide Wildfire Risk Map Effective Date: 6/30/2022 The user assumes the entire responsibility and liability related to their use of this information. By accessing this website and/or data contained within, you hereby release the Oregon Department of Forestry, Oregon State University, Oregon State University Libraries and Press and all data providers from liability. This institution is an equal opportunity provider. Report generated from oregonexplorer.info/wildfirerisk.



LOCAL INFORMATION

Wildfire Risk Classification: **Moderate**

Within Wildland Urban Interface Boundary? **No**

Risk Value: **0.004**

Properties not in the wildland-urban interface or at high or extreme risk will not have additional regulations that apply. Please consider following best practices to protect your home as wildfire does not recognize map boundary lines.

Not within a Structural Fire Protection District or Rangeland Protection Association boundary

Wildland Urban Interface (WUI)

WUI is identified as a geographical area where structures or human development meets or intermingles with wildland or vegetative fuels.

Wildfire Risk Classification

Moderate Wildfire Risk. A net value change (risk value) of greater than 0.001911 to 0.137872. Typically characterized as having the capacity to generate a wildfire which produces a flame length of 4 to 6 feet, and that occasionally exhibits spotting, torching, or crowning.

TWO major elements of the fire environment in your area are summarized below by the values in your **property ownership as directed by Senate Bill 762**.

Burn Probability

Burn probability is based on how often wildfire has occurred in your area. The average probability of a large wildfire (>250 acres) in your taxlot is **Lowest**.

Fire Intensity and Flame Length

The intensity of a fire indicates how difficult it will be to control and can be measured by expected flame lengths. Under high fire intensities, a fire is more difficult to control and will likely have higher impacts to property and risk to lives. Average flame lengths in your area are expected to be about **3 feet**, but flame lengths may be much higher in some places and under severe weather.

To view details about a layer or download data, go to the layer list, and click the (i) icon

The screenshot displays the Oregon Wildfire Risk Explorer interface. At the top, the header includes the Oregon Explorer logo, the Oregon State University (OSU) and University of Oregon (UO) logos, and the title "Oregon Wildfire Risk Explorer Map Viewer". A search bar and "Sign in" button are on the right. The main interface is split into a left sidebar and a main map area. The sidebar, titled "Layers", contains a "Filter Layers..." section with a "Filter" button. Below this is a list of layers with checkboxes and expand/collapse icons. The "Wildland Urban Interface" layer is checked and has a blue information icon (i) next to it. A blue arrow points from the text "View layer details" to this icon. At the bottom of the sidebar, there are "Layers" and "Home" buttons, with a blue arrow pointing to the "Layers" button from the text "Open layer list". The main map area shows an aerial view of a region with pink hatched areas representing wildfire risk. Labels for "Philomath" and "CORVALLIS" are visible. A scale bar at the bottom indicates 0, 1.5, and 3 km. The footer contains copyright information: "ODOT | Earthstar Geographics | © OpenStreetMap © Car" and "Oregon Explorer Feedback".

Open layer list

Wildland Urban Interface

The wildland-urban interface is the geographic area where structures and other human development meets or intermingles with wildland or vegetative fuels. It can be thought of as a transition zone between wildlands and human communities. On one side of the WUI, in the wildlands, fires are less likely to damage buildings because there are too few buildings. On the other side of the WUI, in the developed core of a community, there is not enough vegetation to support wildfires. In the WUI there is enough vegetation to support a wildfire and there is enough development that wildfires could result in significant damage to homes, critical infrastructure and human lives.

(OSU, 2022)

[Technical Guide](#)

show less

View metadata

View the layer's metadata

← View metadata

Download layer

Download the layer

← Download data

View Service Info

View the layer web service information

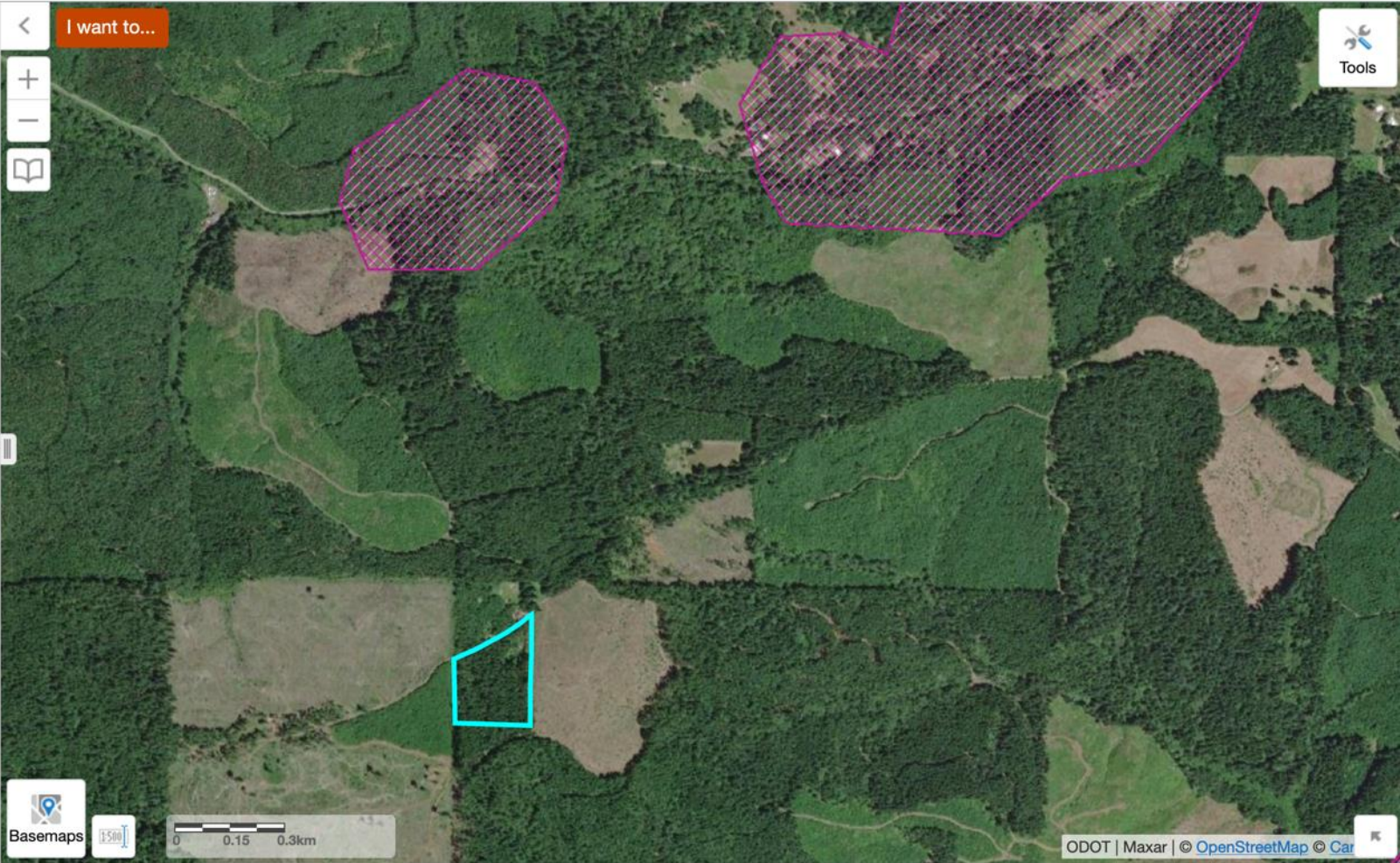
Zoom to full extent

Zoom the map to the full extent of the layer.

Zoom to visible scale

Zoom the map to a scale where the layer is visible.

Wildland Urban Inter... Home Homeowner's Report





Key Resources

OSU Wildfire Risk Mapping

<https://osuwildfireriskmap.forestry.oregonstate.edu/>

Technical guides available upon request

Oregon Wildfire Risk Explorer

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



Thank you to the primary OSU Team

- Mindy Crandall, Oregon State University, Corvallis, OR.
- Emily Jane Davis, Oregon State University, Corvallis, OR.
- Erica Fischer, Oregon State University, Corvallis, OR.
- Myrica McCune, Oregon State University, Corvallis, OR.
- Andy McEvoy, Oregon State University, Corvallis, OR.
- Caitlyn Reilly, Oregon State University, Corvallis, OR.
- Janine Salwasser. Oregon State University, Corvallis, OR.

Jasper Fox



Phineas Ash

