

# COASTAL FIRE HISTORY, THE TILLAMOOK BURN, THE UPPER NEHALEM AND FIRE PREVENTION



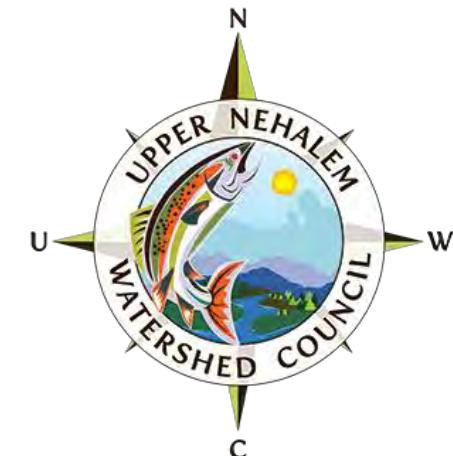
Aaron Groth

Regional Fire Specialist  
(Coast)/Assistant Professor  
(Practice)

Oregon State University

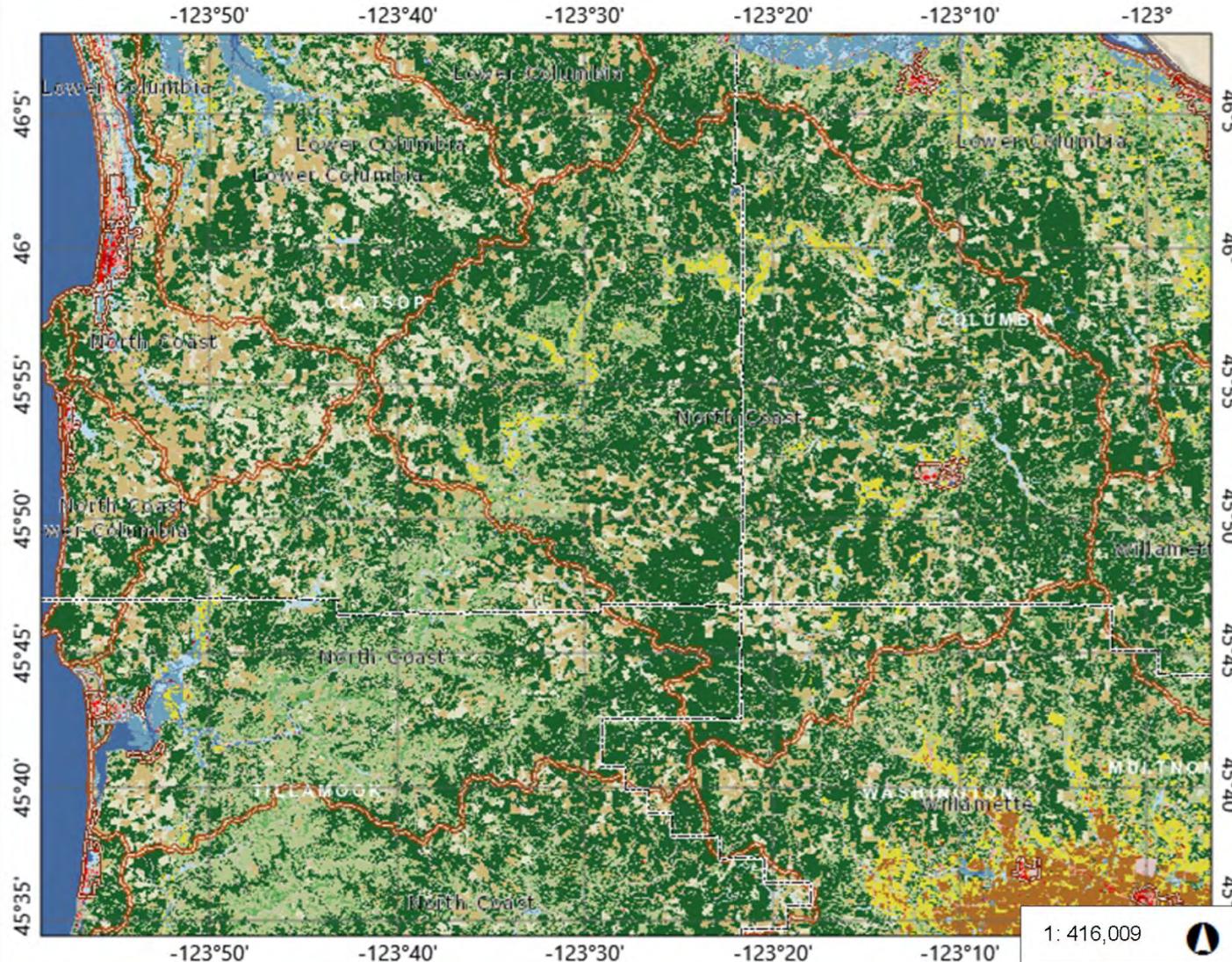
Forestry & Natural Resources  
Extension Fire Program

24 June 2021





## Nehalem Watershed Land Use



### Legend

- States & Provinces
    - Other States and Provinces
    - Oregon
  - Incorporated
  - Unincorporated
  - Counties
  - Watershed Council Boundaries
- NLCD 2016
- Unclassified
  - Open Water
  - Perennial Snow/Ice
  - Developed, Open Space
  - Developed, Low Intensity
  - Developed, Medium Intensity
  - Developed, High Intensity
  - Barren Land
  - Deciduous Forest
  - Evergreen Forest
  - Mixed Forest
  - Shrub/Scrub
  - Herbaceous
  - Hay/Pasture
  - Cultivated Crops
  - Woody Wetlands
  - Emergent Herbaceous Wetlands

### Notes

Created by Aaron Groth, OSU Extension Fire Program

13.1      0      6.57      13.1 Miles

WGS\_1984/Web/Mercator/Auxiliary\_Sphere  
© Oregon Explorer (<https://oregonexplorer.info>)

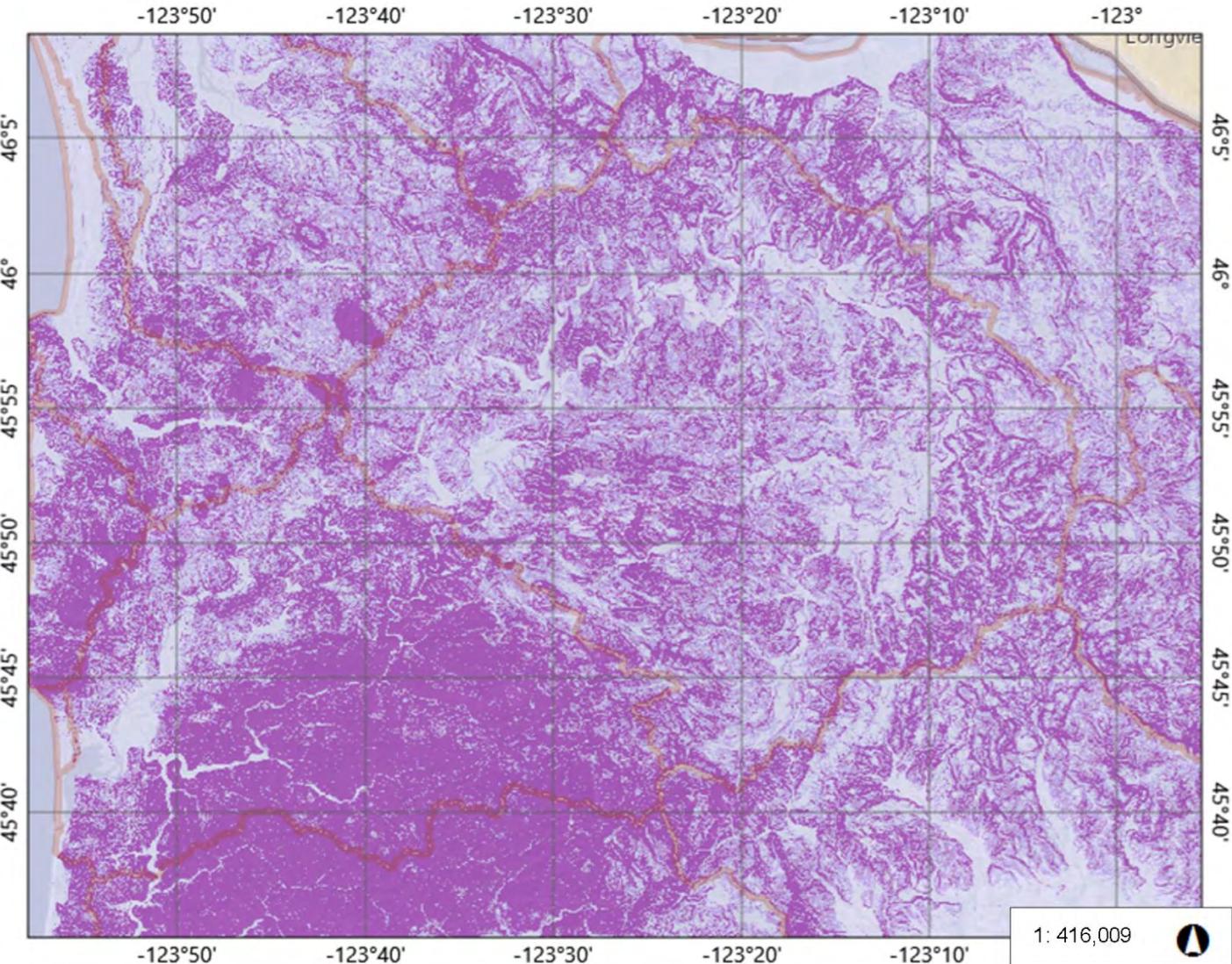
This map is a user generated static output for reference only from:

[Planner's Map Viewer](#)

Data layers that appear on this map may or may not be accurate, current, or reliable.  
THIS MAP IS NOT TO BE USED FOR NAVIGATION.



## Nehalem Watershed Slope



### Legend

- States & Provinces
- Other States and Provinces
  - Oregon
- Slope
- 0 - 10
  - 10.0000001 - 15
  - 15.0000001 - 20
  - 20.0000001 - 30
  - 30.0000001 - 756
- Watershed Council Boundaries

### Notes

Creator: Aaron Groth  
OSU Extension Fire Program

13.1      0      6.57      13.1 Miles

WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere  
© Oregon Explorer (<https://oregonexplorer.info>)

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LOG JAM NEHALEM RIVER  
-1- TILLAMOOK ORE

# Nehalem River



Photo: Aaron Groth

# Nehalem River



Photo: Aaron Groth

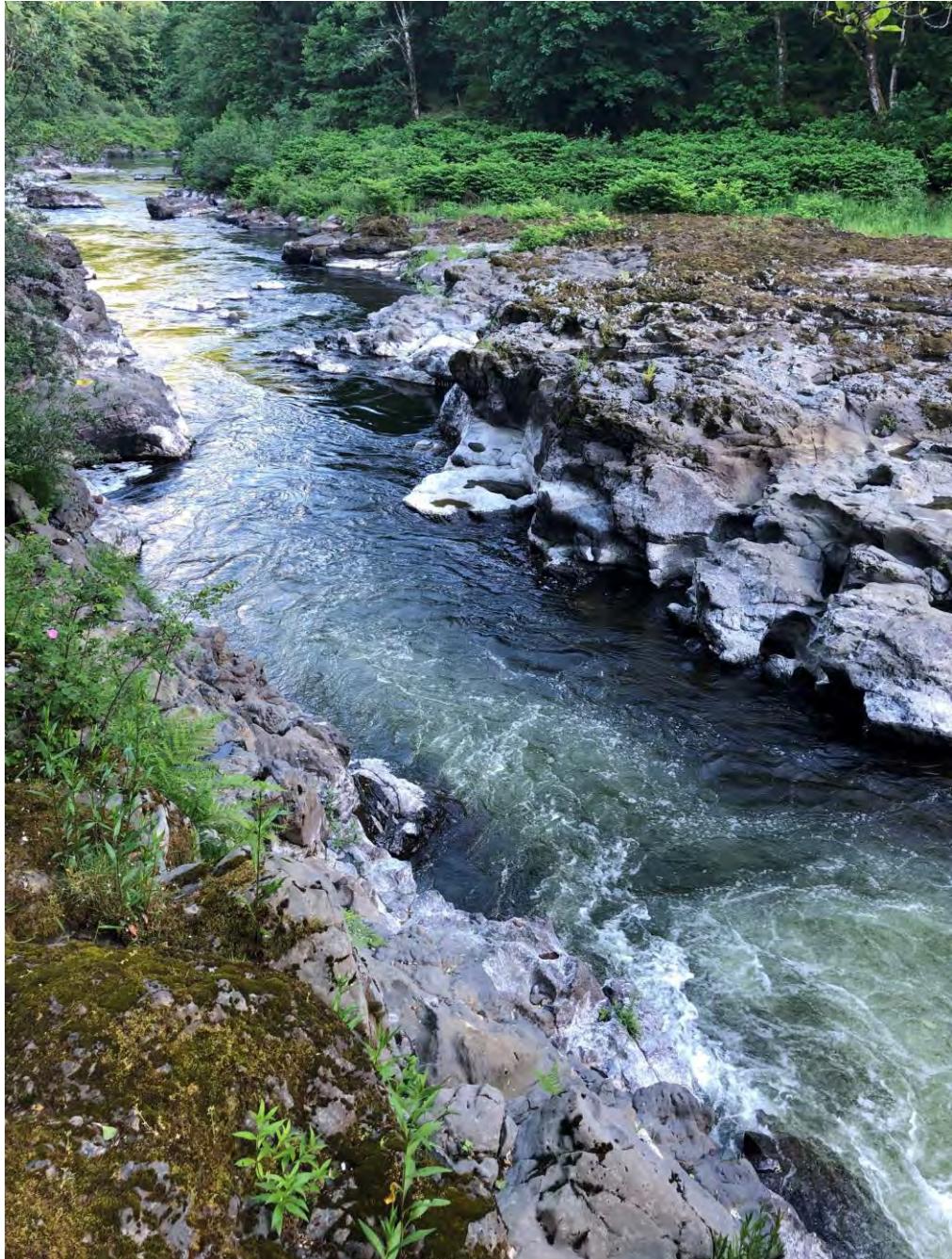
# Nehalem River



Photo: Aaron Groth

# Nehalem Falls

Photos: Aaron Groth



# The Nehalem River enters the Pacific



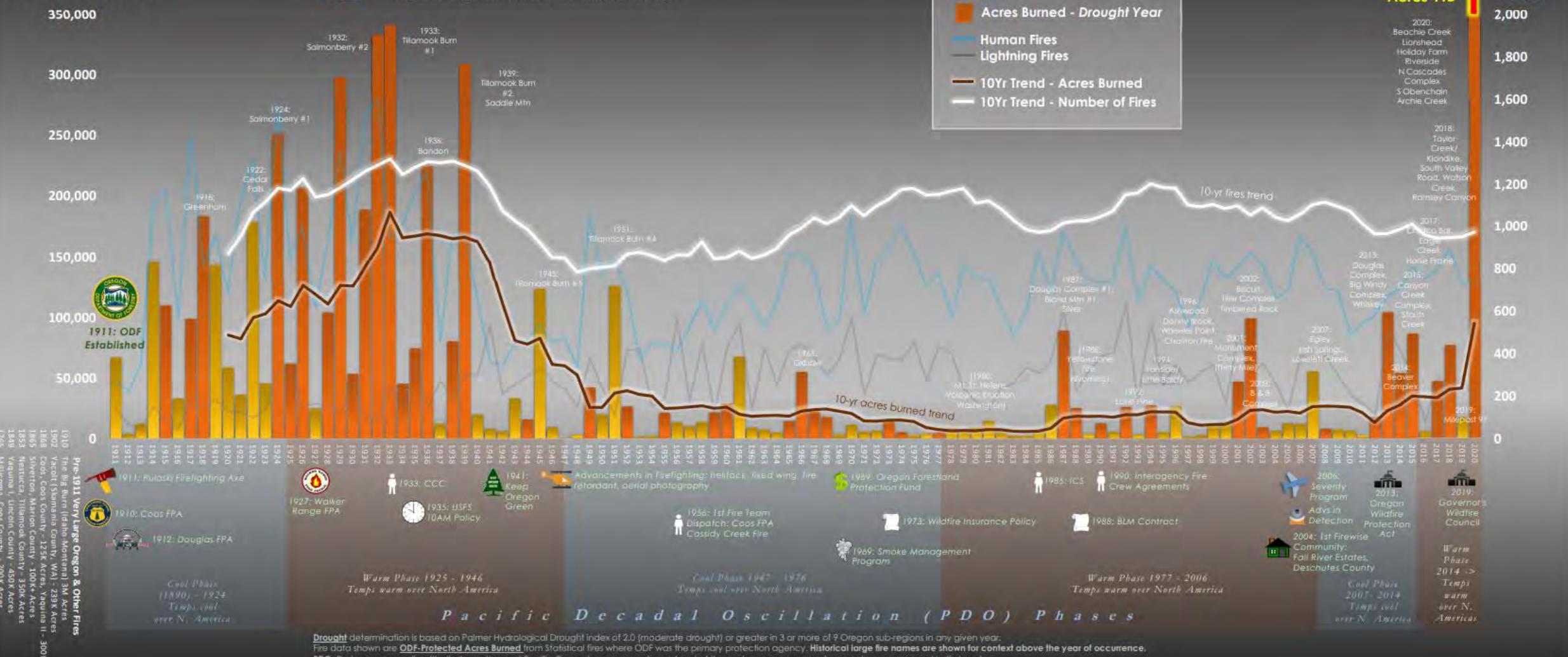
Photo: Tillamook Headlight Herald,  
[Feedback sought on proposal to add a section of Nehalem River to the State Scenic Waterways Program | Community | tillamookheadlightherald.com](http://Feedback sought on proposal to add a section of Nehalem River to the State Scenic Waterways Program | Community | tillamookheadlightherald.com)

## Protected Acres Burned

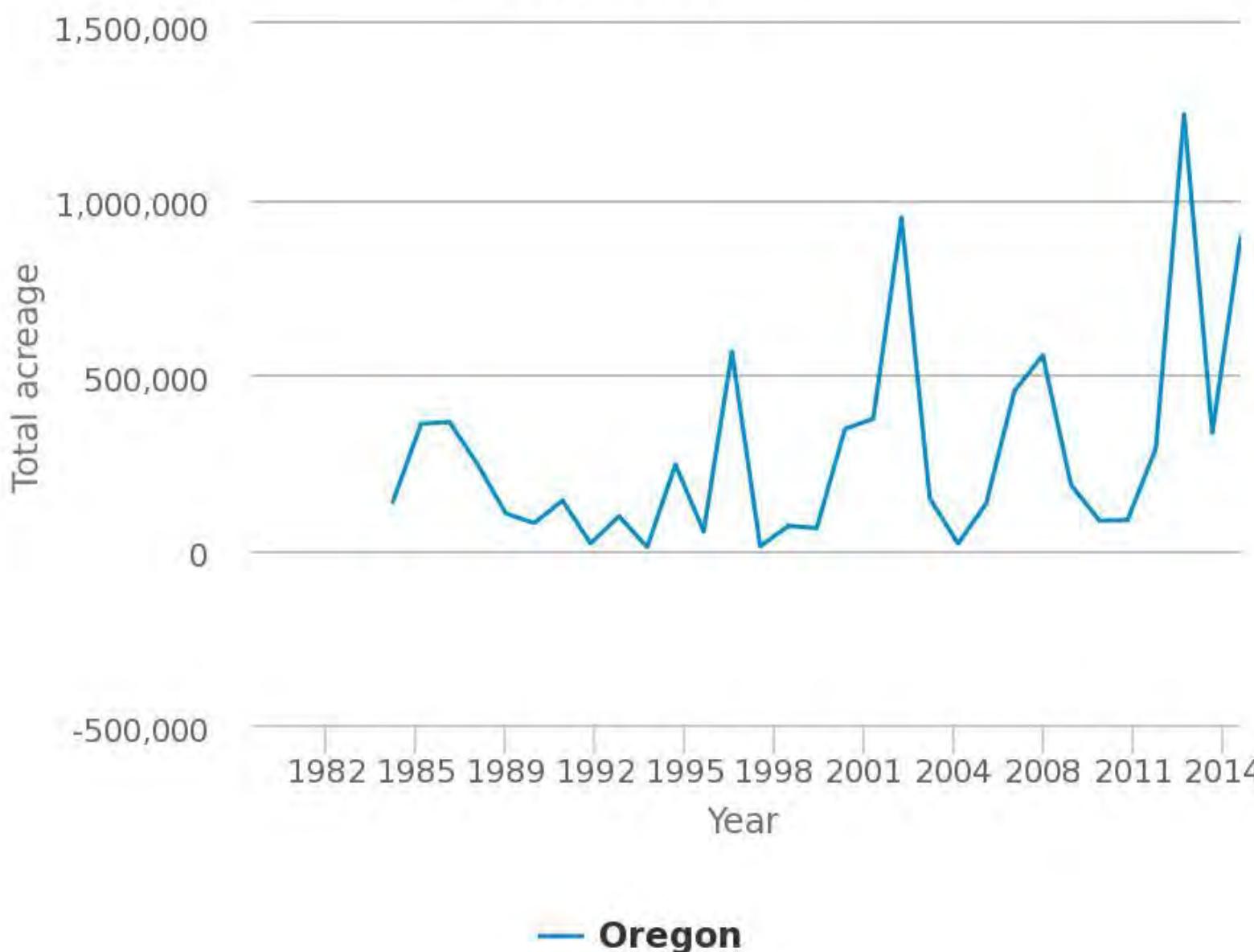


ODF Fire History 1911-2020

Data from 1911-1998: Wolf, Gibson, Zybach Archives  
Data from 1999-2020: ODF FiresDB; 2020 data from NWCC and ODF  
Large Fires labeled for reference: NFC, Zybach @ NW Maps Co. 2011  
PDO and Drought Data from ODF Meteorology/Smoke Mgmt



# Total Annual Burned Acreage Due to Wildfires

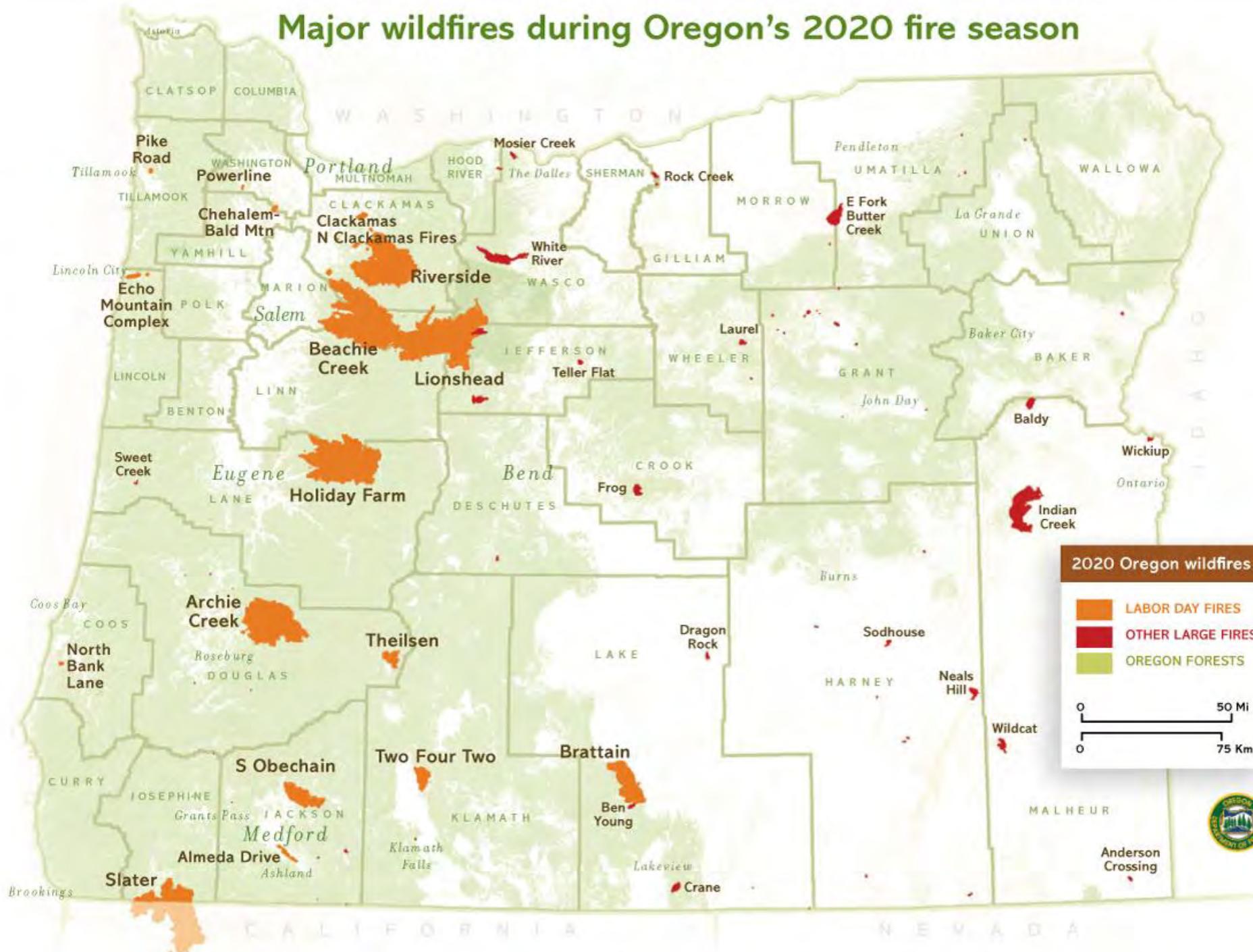


Source: EPA

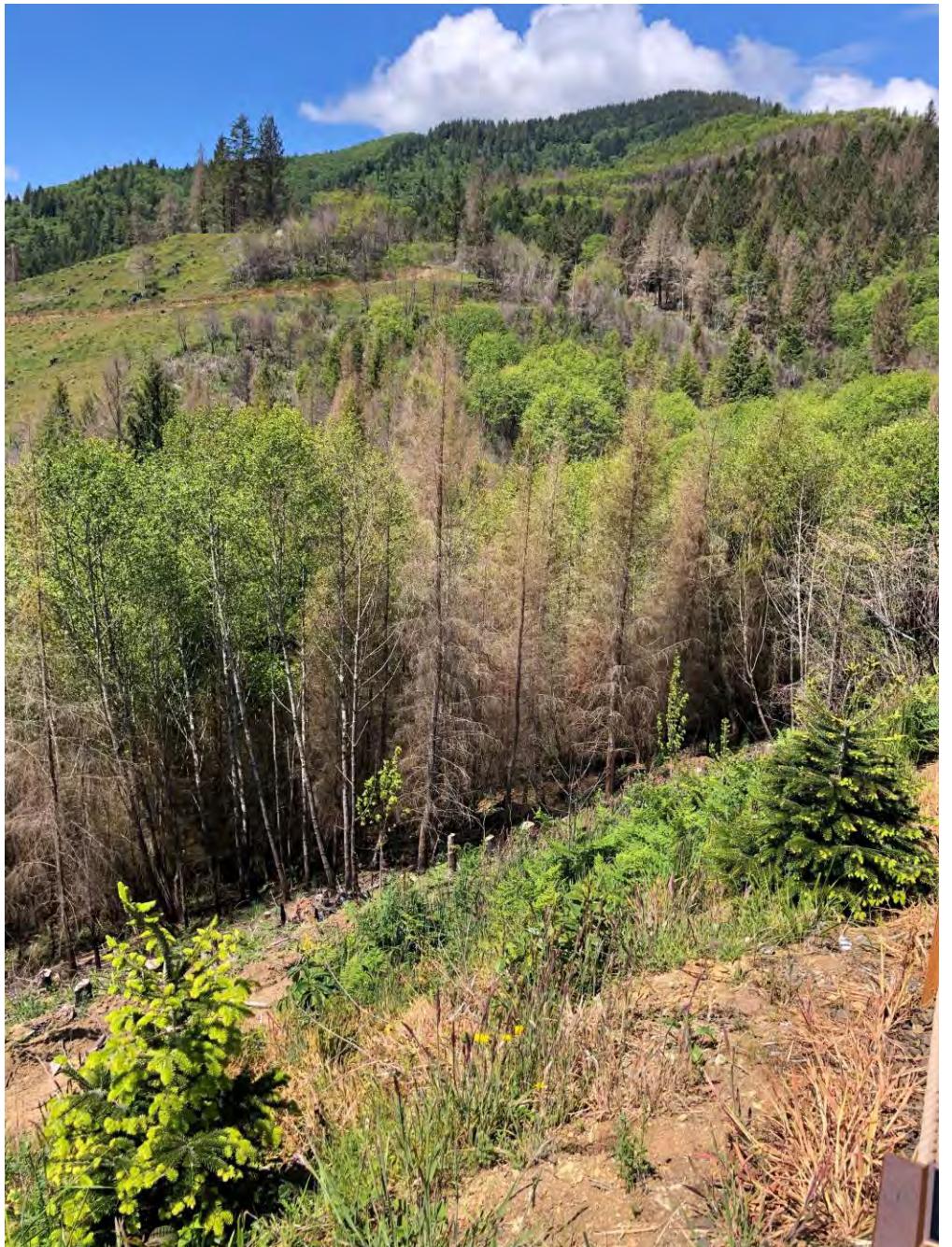
<https://www.epa.gov/climate-indicators/climate-change-indicators-wildfires#>

MTBS (Monitoring Trends in Burn Severity). 2016. MTBS data summaries. [www.mtbs.gov/data/search.html](http://www.mtbs.gov/data/search.html).

# Major wildfires during Oregon's 2020 fire season



Source: ODF



Pike Road Fire Site  
301 Acres (ODF)  
“Under Investigation”

## Public Information

Echo Mountain Complex  
OR-553S-553018  
09/10/2020

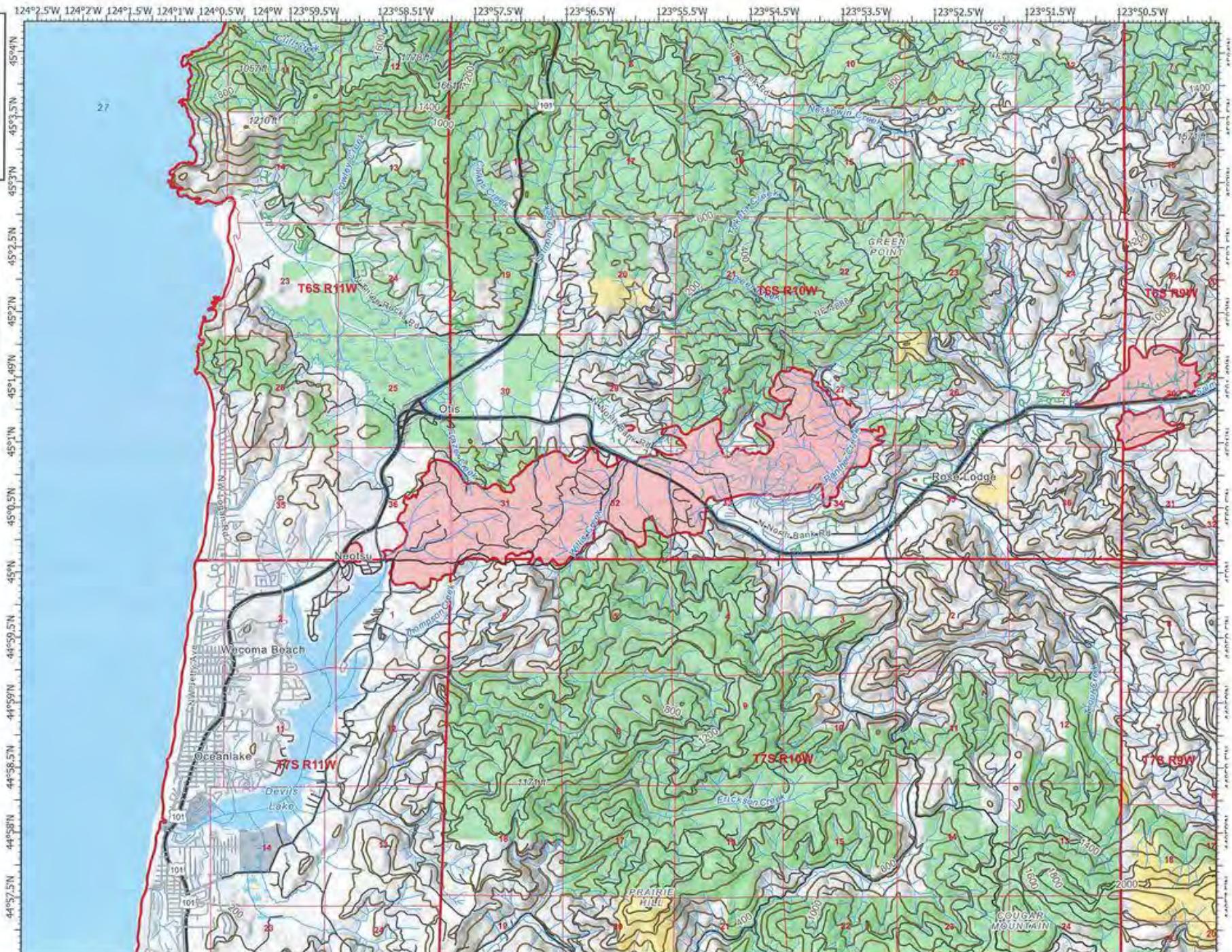
2435 acres at 9/9/2020

0 0.25 0.5 1 Miles

- Wildfire Daily Fire Perimeter
- Streams
- Federal or State highway
- Paved
- All weather
- Dirt
- Hiking trail
- City
- Mainline Rd
- Blocked
- Stub/driveway, less than 200ft
- Contour 200
- Oregon Other State Lands
- Oregon Parks and Recreation Department
- United States Fish and Wildlife Service
- United States Bureau of Land Management
- United States Forest Service



ODF GIS  
09/10/2020 1046  
Acres from IR  
North American 1983 Datum, Lat/long Grid

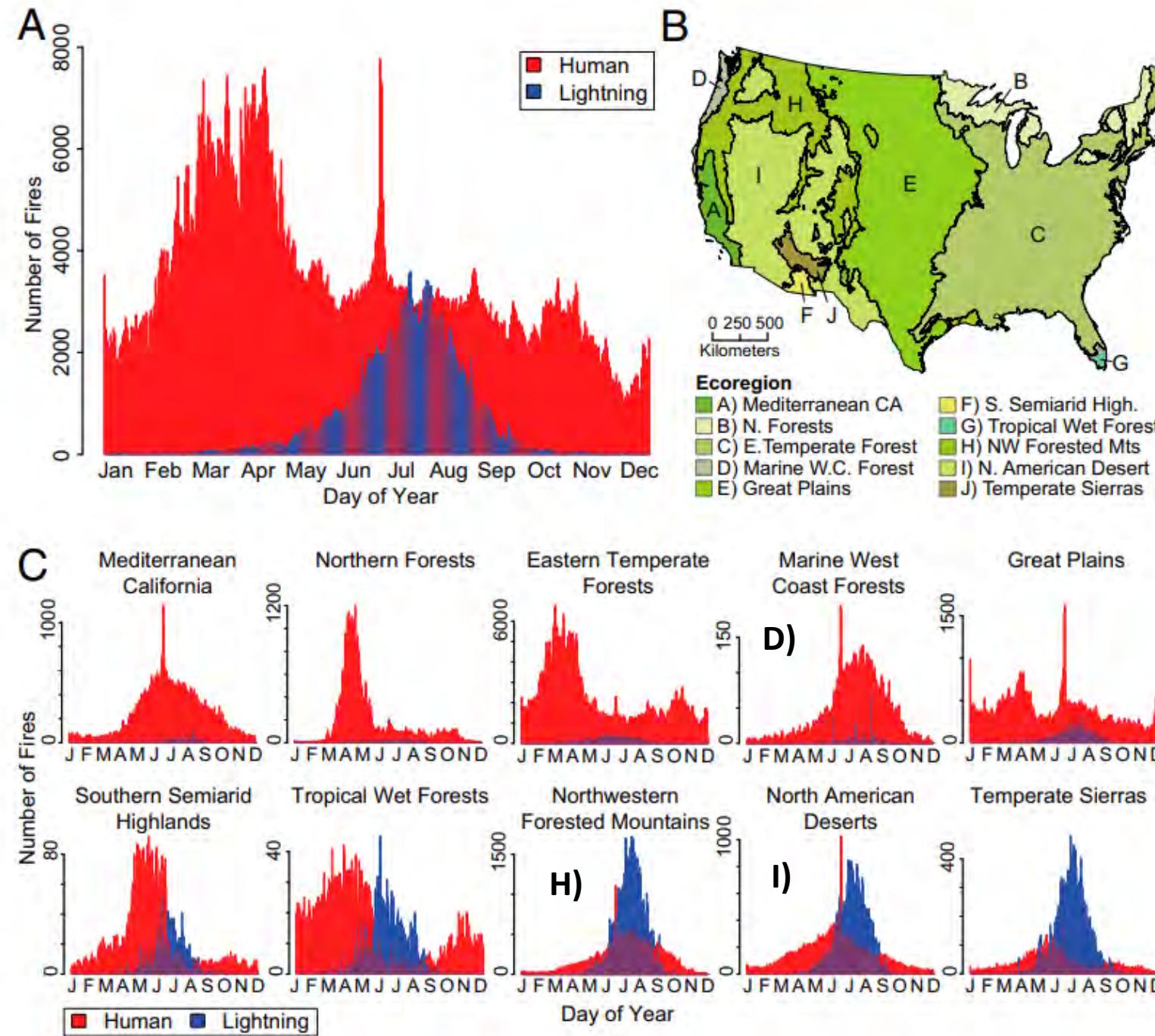


# When does fire occur?

July 4<sup>th</sup> day of greatest fire activity (human ignitions).

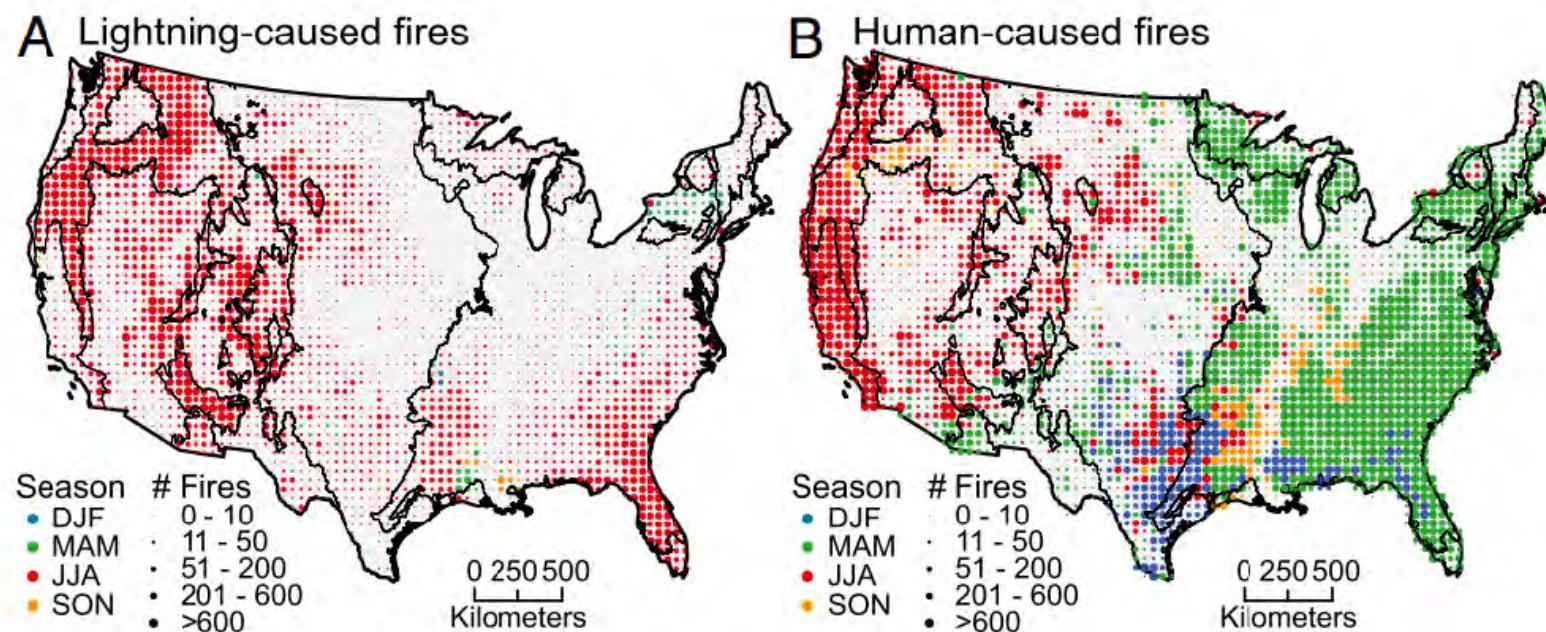
Note: Marine West Coast Forests' fire activity is mostly human ignitions.

In areas of lightning caused fire, **human ignitions have lengthened the fire season.**



Balch, Jennifer K., Bethany A. Bradley, John T. Abatzoglou, R. Chelsea Nagy, Emily J. Fusco, and Adam L. Mahood. "Human-started wildfires expand the fire niche across the United States." *Proceedings of the National Academy of Sciences* 114, no. 11 (2017): 2946-2951.

# When Fire Hits: seasonality for lightning vs. human-ignited wildfires

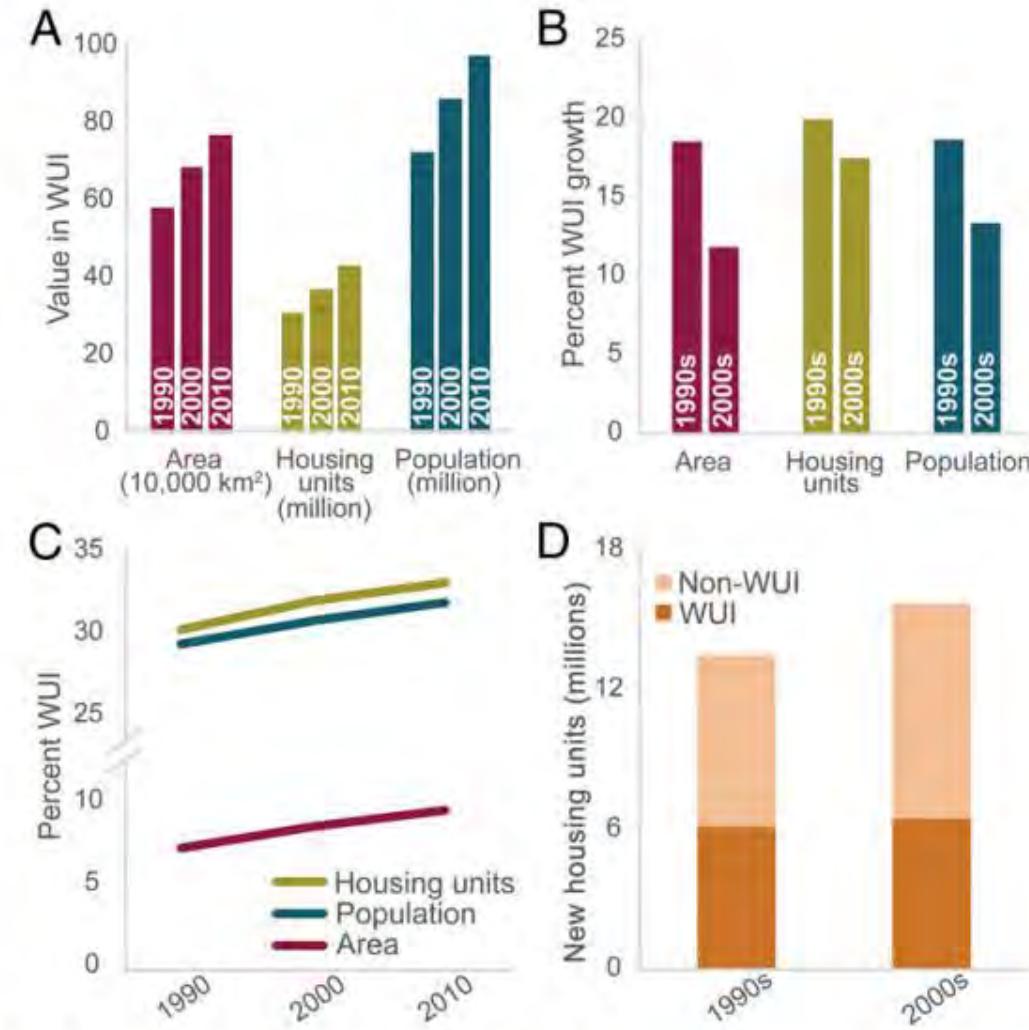


**Fig. 3.** Comparison of seasonality for (A) lightning- vs. (B) human-ignited wildfires. Human ignitions expand the seasonal fire niche considerably into spring and fall months. Colors show the season with the maximum ignitions caused by lightning and human within each 50 km x 50-km grid cell. Size of dot indicates the number of unique lightning and human fires between 1992 and 2012. Ecoregion boundaries are overlaid for visualization.

# Where Fire Hits: Wildland-Urban Interface

1990 to 2010

- Increasing number of houses (from 30.8 to 43.4 million; 41% growth)
  - Within the perimeter of wildfires (1990–2015), 286,000 houses in 2010, VS. 177,000 in 1990.
- WUI land area extent (from 581,000 to 770,000 km<sup>2</sup> ; 33% growth)
  - 9% of the USA's total land area is within the WUI
  - projected to double by 2030
- Increasing population
- **WUI growth often results in more wildfire ignitions, putting more lives and houses at risk.**



**Fig. 2.** WUI growth was rapid in terms of the absolute numbers of the area, houses, and people in the WUI in 1990, 2000, and 2010 (A); WUI growth rates during the 1990s and the 2000s (B); the proportion of all houses and people, as well as the land area in the WUI in 1990, 2000, and 2010 (C); and the absolute number of all new housing units within and outside the WUI during the 1990s and 2000s (D).

# In short....

- 1) Climate Change: has doubled the amount of land that burns every year since 1970s
- 2) wildland fire costs have significantly increased
- 3) Greater proportion of state/federal agencies' budgets going to wildland fire costs
- 4) More people and houses in the Wildland-Urban Interface (~9% of US territory)
- 5) Human caused ignitions/Lengthening of the Fire Season
- 6) Increase in number of days of extreme fire weather & less summer precipitation

# Before we get started

- 1) Native American burning/land management
- 2) Settlement: agriculture, logging, and grazing histories
- 3) Fire Suppression
- 4) Across the US West, an average of 2.8 months increase in duration of fire season (that varies significantly depending on ecosystem)

**We have changed the structure and composition of our forests, as well as configuration of land uses/land covers across the landscape**

# **Content**

**Preface: Wildfire in Watersheds**

**I. OSU's new Fire Program**

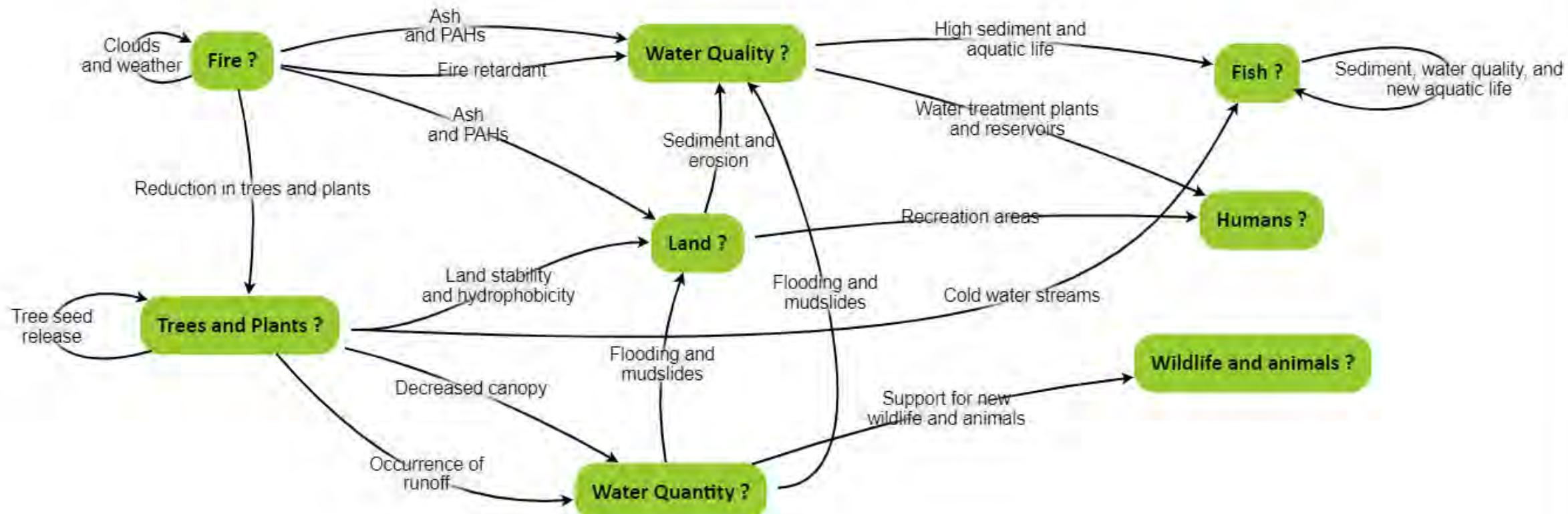
**II. Coastal Fire History**

**III. Fire in the Nehalem Watershed/Fires in Clatsop,  
Columbia, Tillamook Counties, and Washington  
Counties**

**V. Going into the 2021 Fire Season**

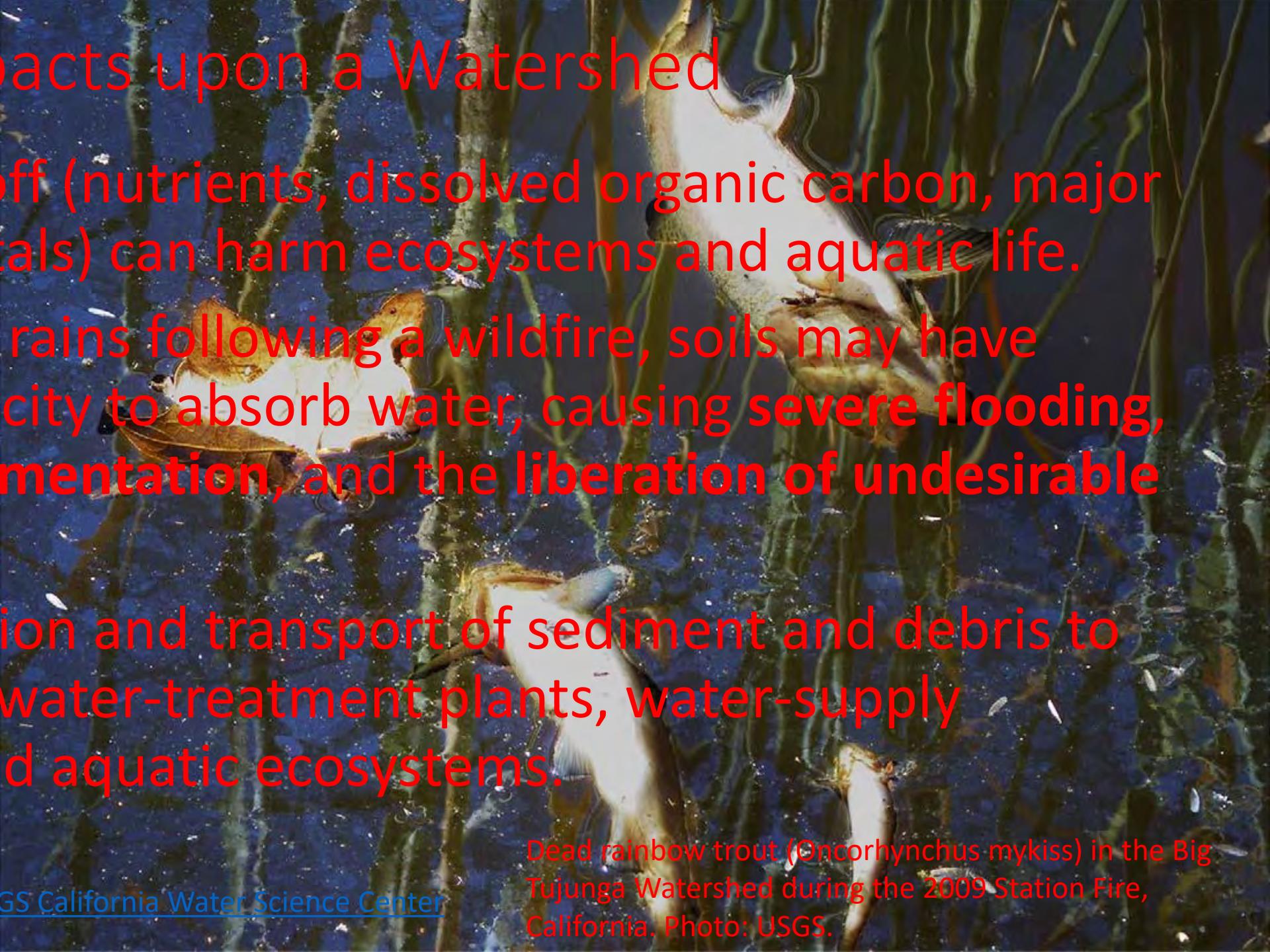
**VI. What you can do to protect your home, family, and  
land**

# How wildfires impact a watershed



# Wildfire Impacts upon a Watershed

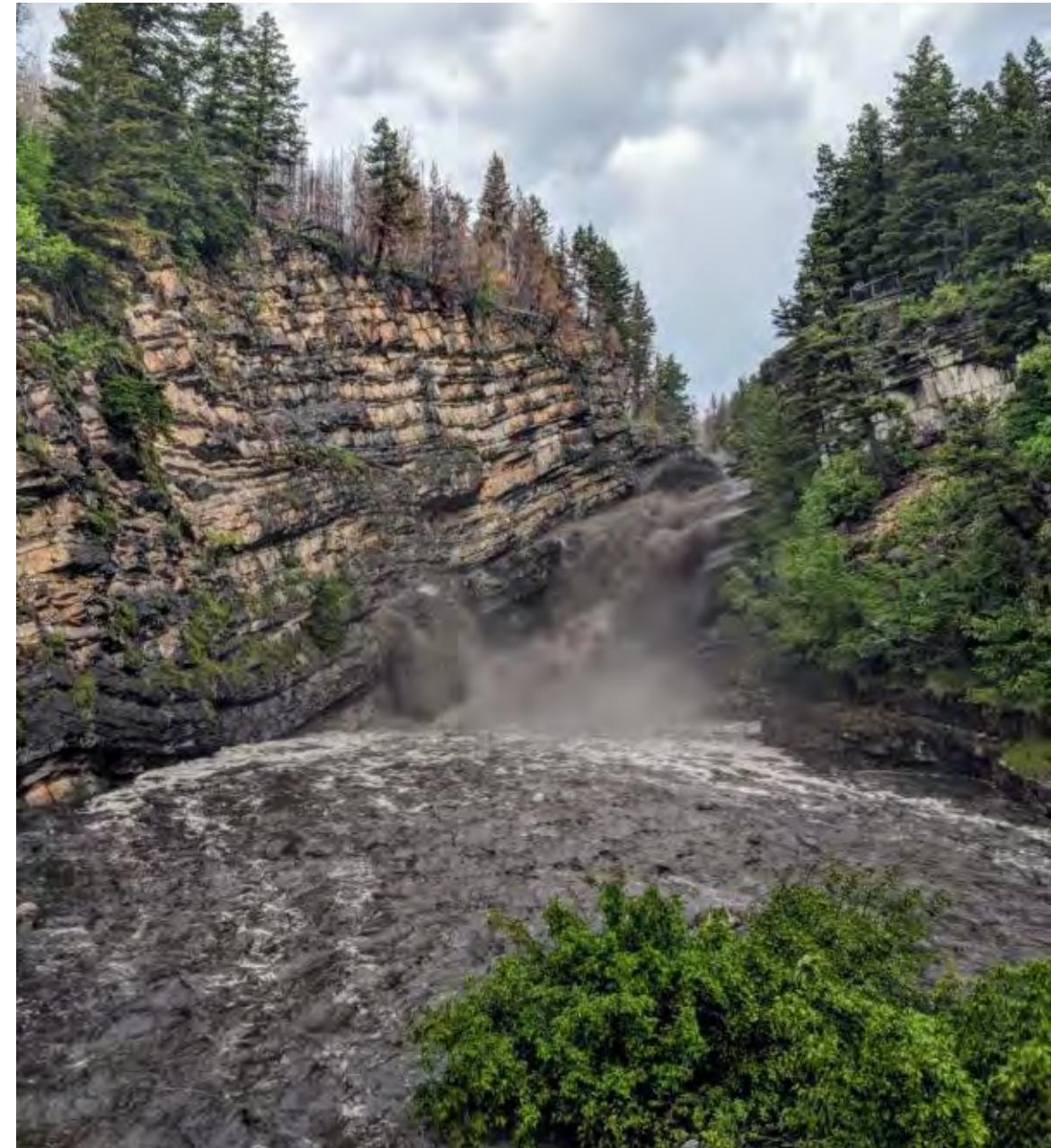
- Post-fire runoff (nutrients, dissolved organic carbon, major ions, and metals) can harm ecosystems and aquatic life.
- During heavy rains following a wildfire, soils may have reduced capacity to absorb water, causing **severe flooding, extreme sedimentation, and the liberation of undesirable chemicals.**
- Post-fire erosion and transport of sediment and debris to downstream water-treatment plants, water-supply reservoirs, and aquatic ecosystems.



Dead rainbow trout (*Oncorhynchus mykiss*) in the Big Tujunga Watershed during the 2009 Station Fire, California. Photo: USGS.

# Implications of Wildfire for Drinking Water

- Degradation of water quality and supply: extent and intensity of the wildfire, post-wildfire precipitation, watershed topography, and local ecology.
- enhanced mobilization of nutrients, sediments and dissolved organic carbon (DOC), can impact the ability of drinking water utilities to produce water that meets EPA standards
- Increased turbidity may increase chemical treatment requirements and produce larger volumes of sludge, both of which would raise operating costs
- need for alternative supplies



Cameron Falls runs black with soot and charred debris on June 21, one year after a fire burned through Waterton Lakes National Park in Alberta. PARKS CANADA / KALEIGH WATSON

# Wildfires are not always bad for watersheds

- The erosion that often follows, replenishes the coarse grain sediments that are critical to fish habitat.
- Fires flush in nutrients that are beneficial to fish.
- “In the years since a major forest fire in 2003 in the Castle Crown Wilderness, west of Waterton Lakes park, the fish in burned areas have grown larger than fish in unburned areas, mainly because large amounts of nutrients released by the fire have flowed into rivers and creeks.”

John Moody (USGS scientist)

[How Wildfires Are Polluting Rivers and Threatening Water Supplies - Yale E360](#)

# I. OSU Forestry and Natural Resources Extension Fire Program

[Fire Program | OSU Extension Service  
\(oregonstate.edu\)](http://Fire Program | OSU Extension Service (oregonstate.edu))

# Fire Program Team

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Program Manager



State Fire Specialist



6 Regional Fire Specialists

# Still Formulating Mission/Values/Priorities

- Assist in identifying landscapes in highest need of a strategic focus of resources to reduce wildfire and landscape health risks at a statewide scale.
- Assist with the implementation of projects on the ground in priority landscapes.
- Provide education and outreach throughout the process for all Oregonians.
- Create fire-adapted infrastructure, communities, and landscapes across the state of Oregon through awareness, education, and outreach.
- Foster resilient landscapes, Fire-adapted communities, and safe and effective wildfire response.

# Fire Aware.Fire Prepared

Wildfire Wednesday Webinars Sessions  
(12:00-1:00pm PDT):

3/17: [It takes a village!](#)

3/31: [From the home to the landscape](#)

4/14: [Building community for wildfire resilience](#)

4/28: BE Ready, BE Set, GO!

TBD: Fire preparedness in my area

5/19: A land of fire

6/2: When fire hits

6/16: After the fire

<https://extension.oregonstate.edu/fire-program/online-webinar-guide>

<https://extension.oregonstate.edu/events/fire-aware-fire-prepared-wildfire-wednesdays>



Photo: Amy Markus |

Programs  
**Fire Program**

Fire Program  
Faculty & Staff  
Events  
About  
**Online Webinar Guide**  
After a Wildfire

Online Webinar Guide

Webinars are brought to you by the [Forestry & Natural Resources Extension Fire Program](#) with support from partnering agencies and organizations.

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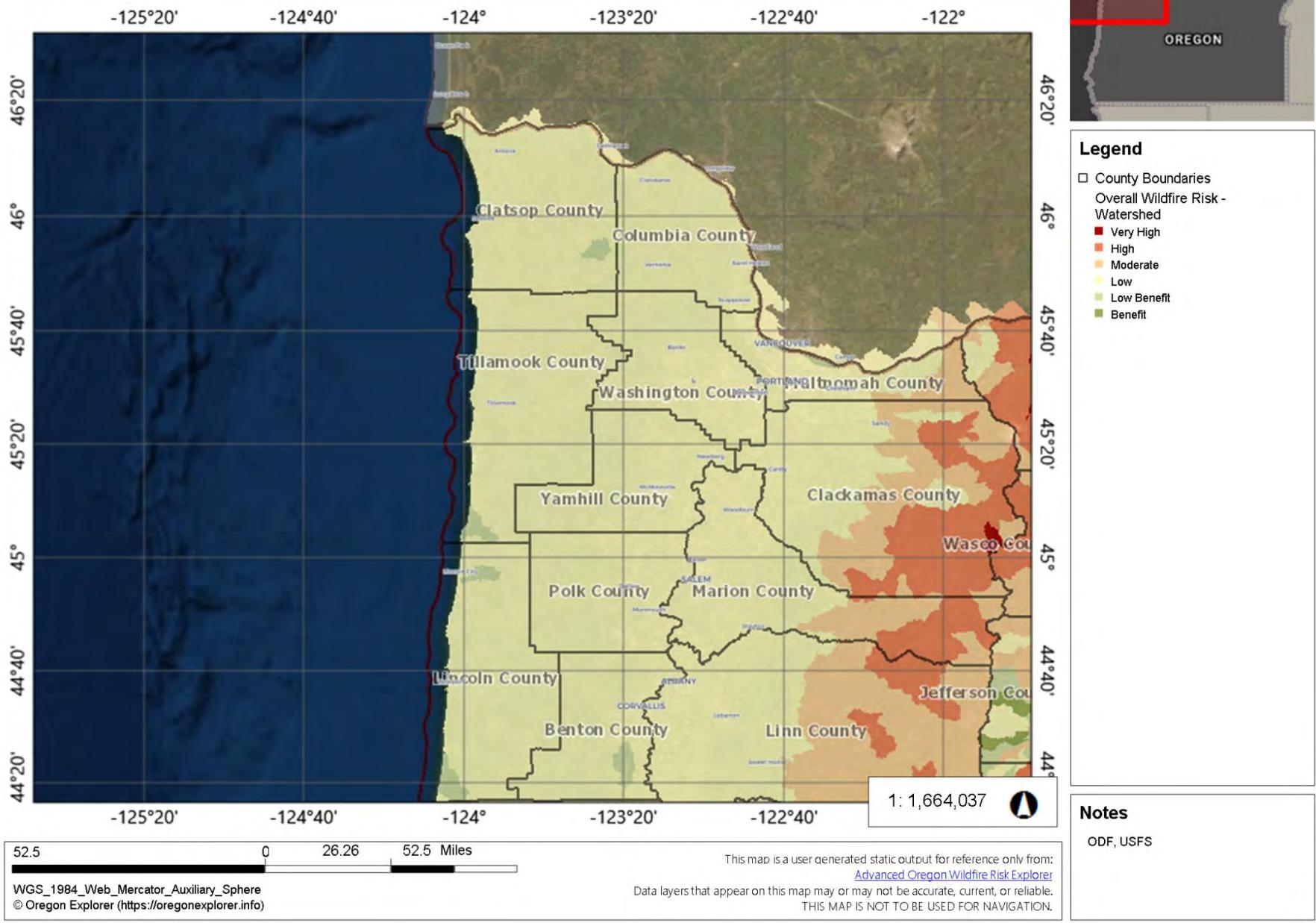
Fire Aware. Fire Prepared. Post-fire series Recorded webinars Accessibility  
Local meetings

**Fire Aware. Fire Prepared.**  
Wildfire Wednesdays





## Fire Risk, Northwest Oregon



The Quantitative Wildfire Risk Assessment (QWRA) does not adequately illustrate Wildfire Risk in Western Oregon.

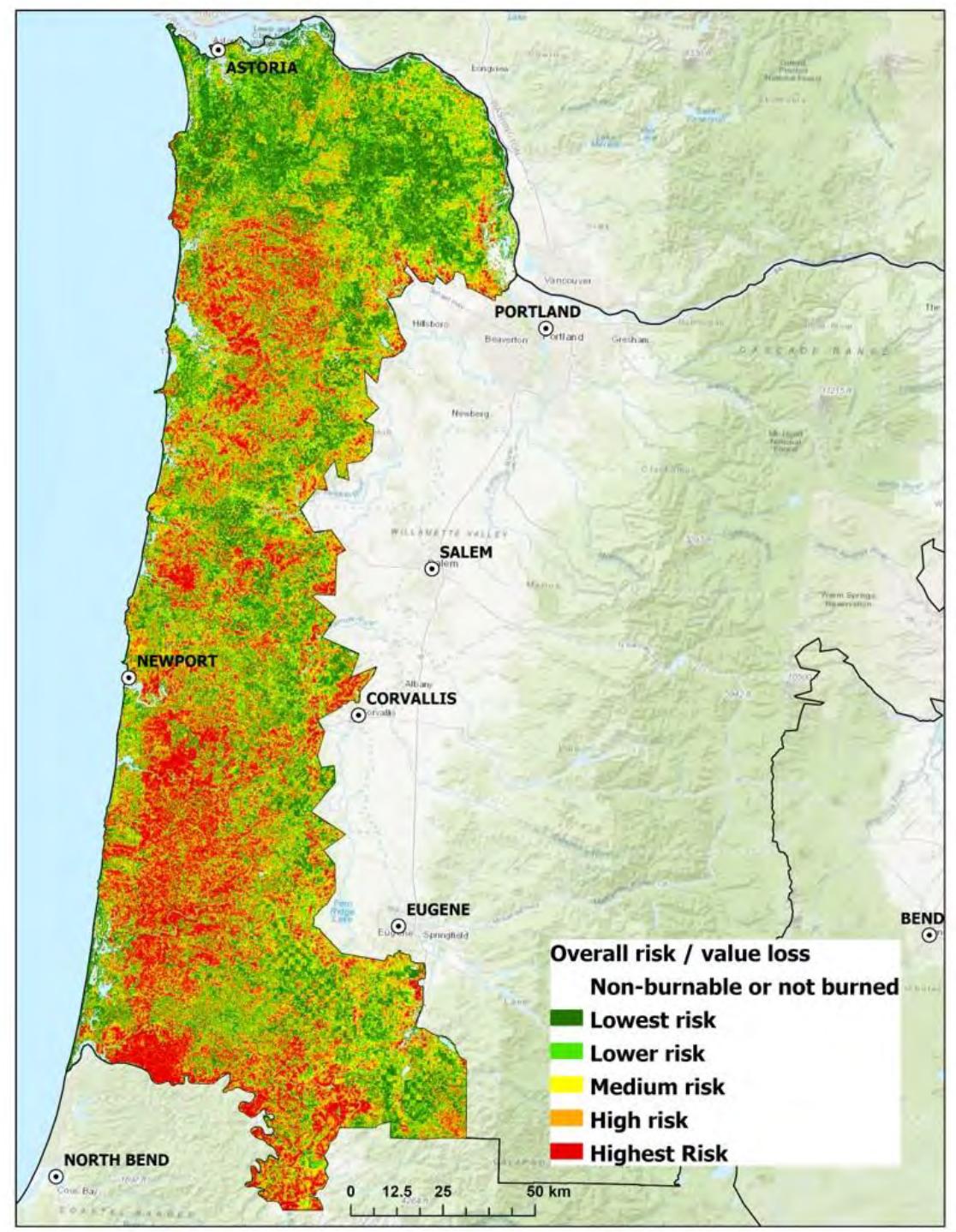
OSU Extension's Fire Program is developing a GIS hub for more localized assessment of wildfire risk.

# Assessment



High Value Resources at Risk	High Value Resources at Risk Subcategory
People	Population density
	Wildland urban interface
Buildings	Building density
	Historic buildings
Buildings	Fire response buildings
	Buildings with vulnerable populations
Infrastructure	Communications infrastructure
	Power infrastructure
Infrastructure	Transportation infrastructure
	Recreation sites
Agriculture	Sawmills
	Agriculture
Timber	Timber volume in harvestable areas
Habitat	Habitat
Species	Threatened, endangered, and at-risk species
	Critical habitat for key species
Species	Big game
	Salmon
Water	Drinking water from groundwater
	Drinking water from surface water
	Scenic waterways

21 Values at Risk were considered during the development of the Fire Program's risk maps.



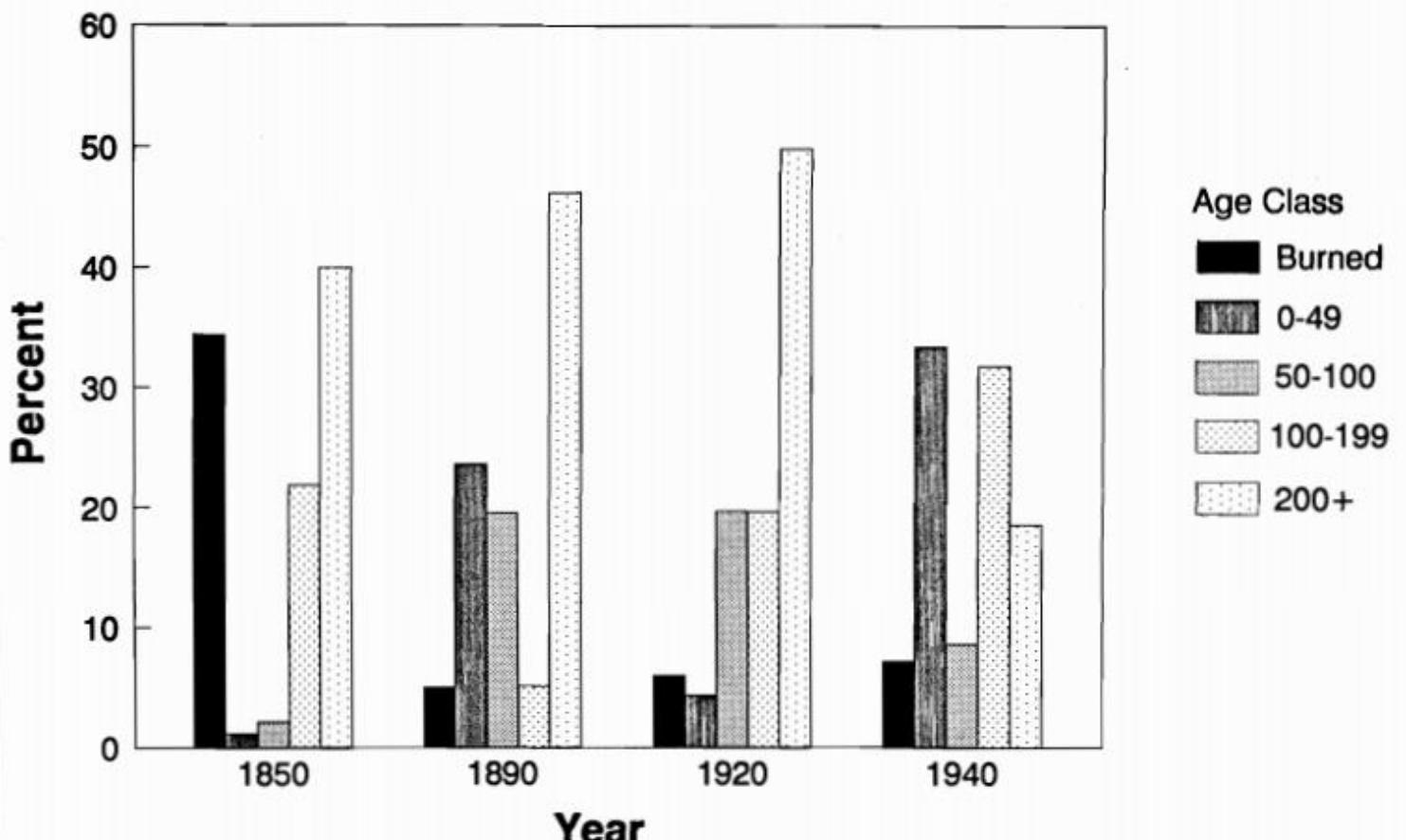
HVRA	HVAR Subcategory	FSA 1 - Northwest Coastal	FSA 2 - Willamette Valley and Cascades	FSA 3 - Northeast	FSA 4 - Southwest	FSA 5 - Central	FSA 6 - Southeast	Value Range	Data Type
People	Population Density							0-9	continuous
	Wildland Urban Interface	5	5	5	5	5	5	0,1	binary
	Building Density							0-9	continuous
Buildings	Historic Buildings	6	6	6	6	6	6	0,1	binary
	Fire Response Buildings	7	7	8	7	8	9	0,1	binary
	Buildings with Vulnerable People	9	9	9	9	9	9	0,1	binary
Infrastructure	Communication Infrastructure	7	7	7	7	7	7	0,1	binary
	Power Infrastructure							0-9	continuous
	Transportation Infrastructure	6	6	6	6	6	6	0,1	binary
	Recreation Sites	2	3	2	2	2	2	0,1	binary
	Sawmills	4	3	5	4	5	5	0,1	binary
Agriculture	Agriculture							0-9	continuous
Timber	Timber Volume in Harvestable Areas							0-9	binary
Habitat	Habitat							0-9	continuous
Species	Threatened, Endangered and At-Risk Species							0-9	continuous
	Critical Habitat for Key Species							0-9	continuous
	Big Game							0-9	continuous
	Salmon	3	3	3	3	3	3	0,1	binary
Water	Drinking Water from Groundwater	5	6	5	6	6	5	0,1	binary
	Drinking Water from Surface Water	4	4	4	4	4	4	0,1	binary
	Scenic Waterways	3	3	3	3	3	3	0,1	binary

Source: Daniel Leavell, State Fire Specialist  
 Peer review process: revise and resubmit

## II. Coastal Fire History

### Stand Age Class Distribution, 1850-1940

(percent by age class)



### Appendix A

Teensma, P. D. A., Rienstra, J. T., & Yeiter, M. A. (1991). Preliminary reconstruction and analysis of change in forest stand age classes of the Oregon Coast Range from 1850 to 1940.

# Special Considerations

- There is a gap in knowledge related to fire history/fire ecology for the Coast (especially compared to the Southwest or Eastern Oregon).
- The PNW Research Station's Westside Fire Initiative is using dendrochronology on the western slopes of the Cascades (for the Coast: historic fire maps)
  - BLM's GLO survey data (e.g., Bob Zybach's The Alsey Valley Prairie Complex, ca. 1850: Native Landscapes in Western GLO Surveys)
- Data collection, different agencies/organizations, spatial-temporal extent

# Native American Land Management

- For thousands of years, ancestral Oregon Indian families kept ridgeline and riparian areas open for travel, hunting, fishing and harvesting purposes. They cleared ground fuels by constant firewood gathering, root harvesting and seasonal fires.
- These actions created widespread systematic firebreaks in a beautiful landscape characterized by foot trails, grass prairies, southern balds, huckleberry fields, camas meadows, oak savannah and islands of mostly even-aged conifers.

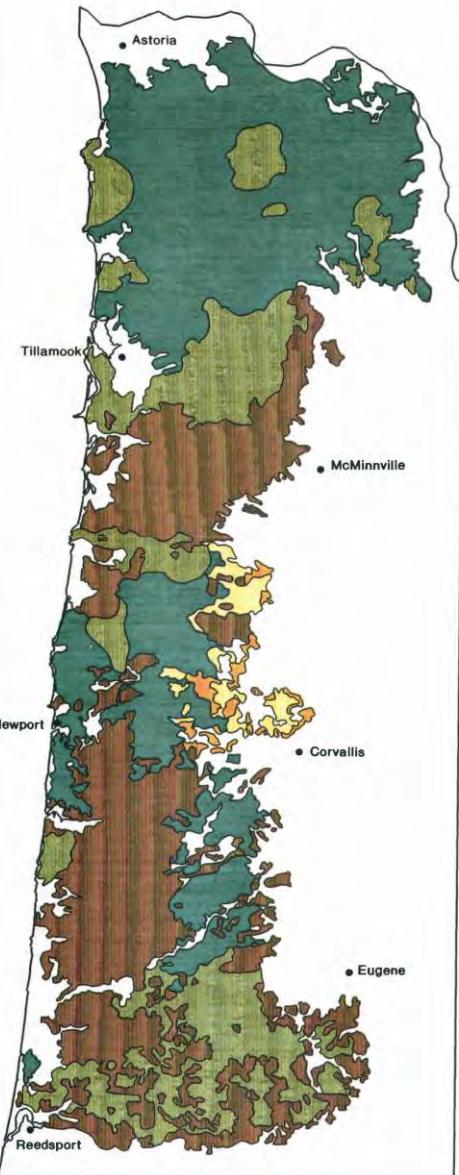
Note: long-term I would like to work with the Tribes on cross-boundary management and co-produce knowledge.

Source: Bob Zybach

[Will we learn Oregon's wildfire history avoid predictable firestorms? \(statesmanjournal.com\)](http://www.statesmanjournal.com)

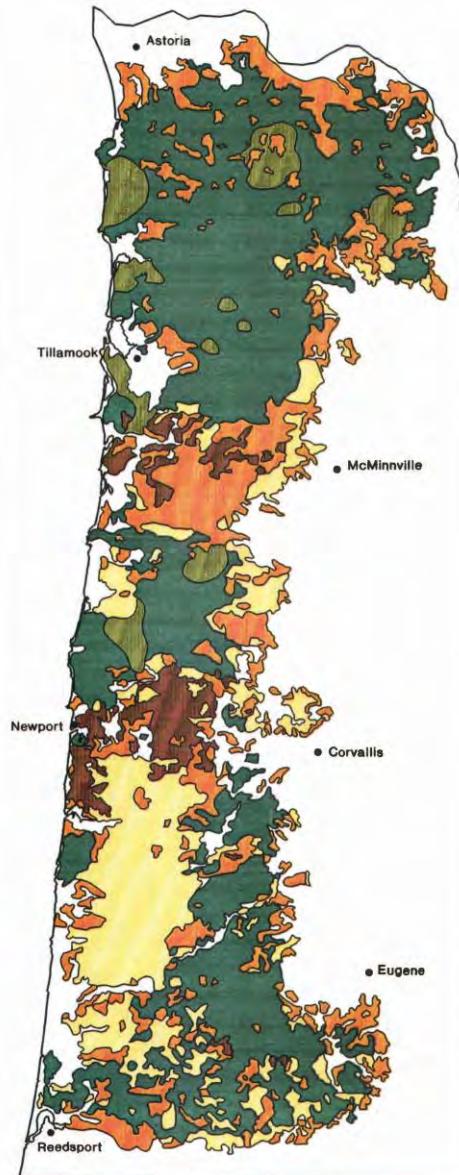
Zybach, Bob. 2003. The Great Fires: Indian Burning and Catastrophic Forest Fire Patterns of the Oregon Coast Range, 1491-1951. Oregon State University, Ph.D. Dissertation.

**FOREST STAND AGE CLASSES  
OREGON COAST RANGE, 1850**



**Note:**  
This map was compiled from reconnaissance field notes. It was digitized from hand interpolated source materials and may differ spatially from digital mapping compiled from other source data. Prepared by Salem District and Oregon State Office, Bureau of Land Management, Sept., 1991.

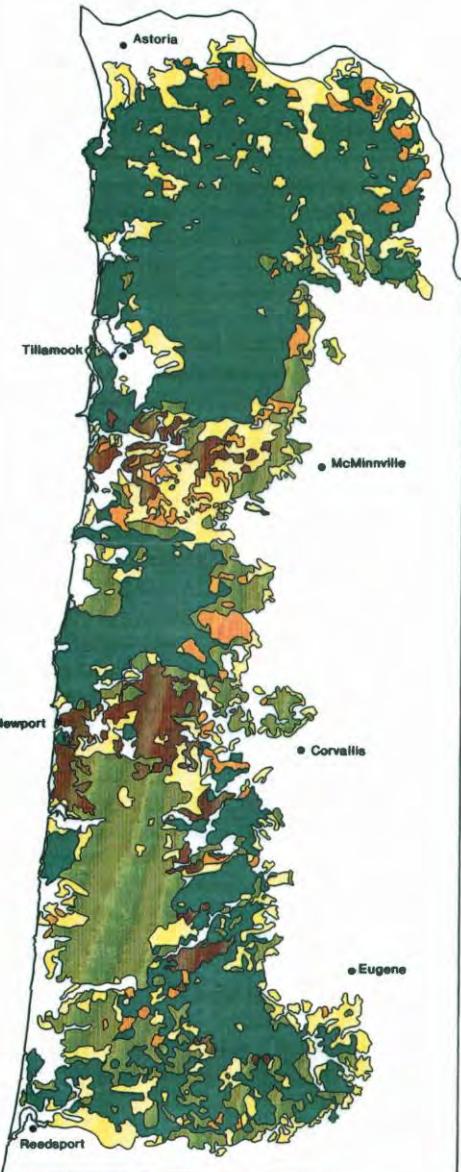
**FOREST STAND AGE CLASSES  
OREGON COAST RANGE, 1890**



**Note:**  
This map was compiled from reconnaissance field notes. It was digitized from hand interpolated source materials and may differ spatially from digital mapping compiled from other source data. Prepared by Salem District and Oregon State Office, Bureau of Land Management, Sept., 1991.

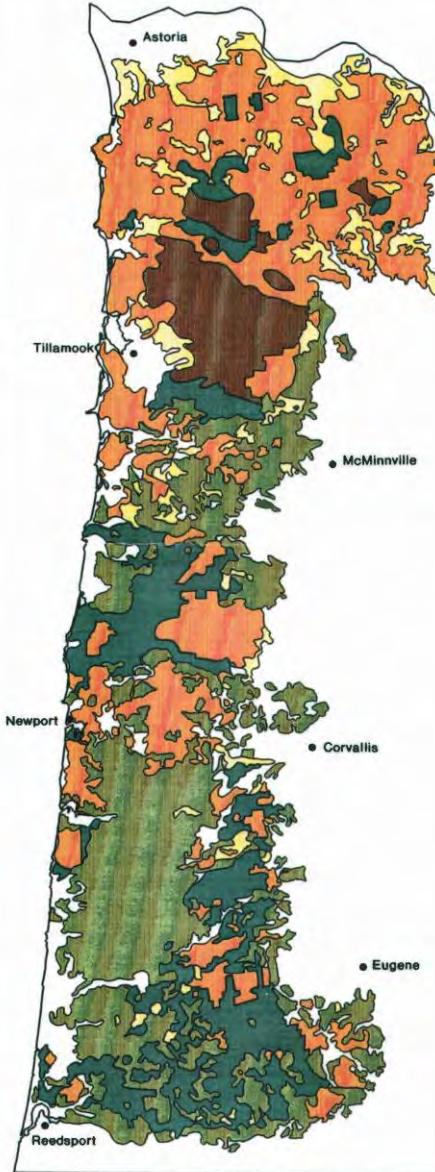
Teensma, P. D.  
A., Rienstra, J.  
T., & Yeiter, M.  
A. (1991).  
Preliminary  
reconstructio  
n and analysis  
of change in  
forest stand  
age classes of  
the Oregon  
Coast Range  
from 1850 to  
1940.

**FOREST STAND AGE CLASSES  
OREGON COAST RANGE, 1920**



**Note:**  
This map was compiled from reconnaissance field notes. It was digitized from hand interpolated source materials and may differ spatially from digital mapping compiled from other source data. Prepared by Salem District and Oregon State Office, Bureau of Land Management, Sept., 1991.

**FOREST STAND AGE CLASSES  
OREGON COAST RANGE, 1940**



**Note:**  
This map was compiled from reconnaissance field notes. It was digitized from hand interpolated source materials and may differ spatially from digital mapping compiled from other source data. Prepared by Salem District and Oregon State Office, Bureau of Land Management, Sept., 1991.

Teensma, P. D.  
A., Rienstra, J.  
T., & Yeiter, M.  
A. (1991).  
Preliminary  
reconstruction  
and analysis  
of change in  
forest stand  
age classes of  
the Oregon  
Coast Range  
from 1850 to  
1940.



0 4 8 16 24 32 Miles

Tillamook

- [Yellow] Oak savanna, and upland praries
- [Blue] Sitka spruce, lodgepole pine, hemlock, cedar
- [Light Blue] Wetland prairies and tidelands
- [Green] Douglas fir forestland
- [Brown] Woodlands
- [Pink] Late 18th century fires
- [Orange Diagonal Lines] Late 19th century fires
- [Red] Early 20th century fires
- [White] Sand dunes and beaches
- △ Marys Peak
- ✿ Willamette Falls

B. Zybach and A. Matzke  
(c) NWMaps Co. 20030505

Coos

Millicoma

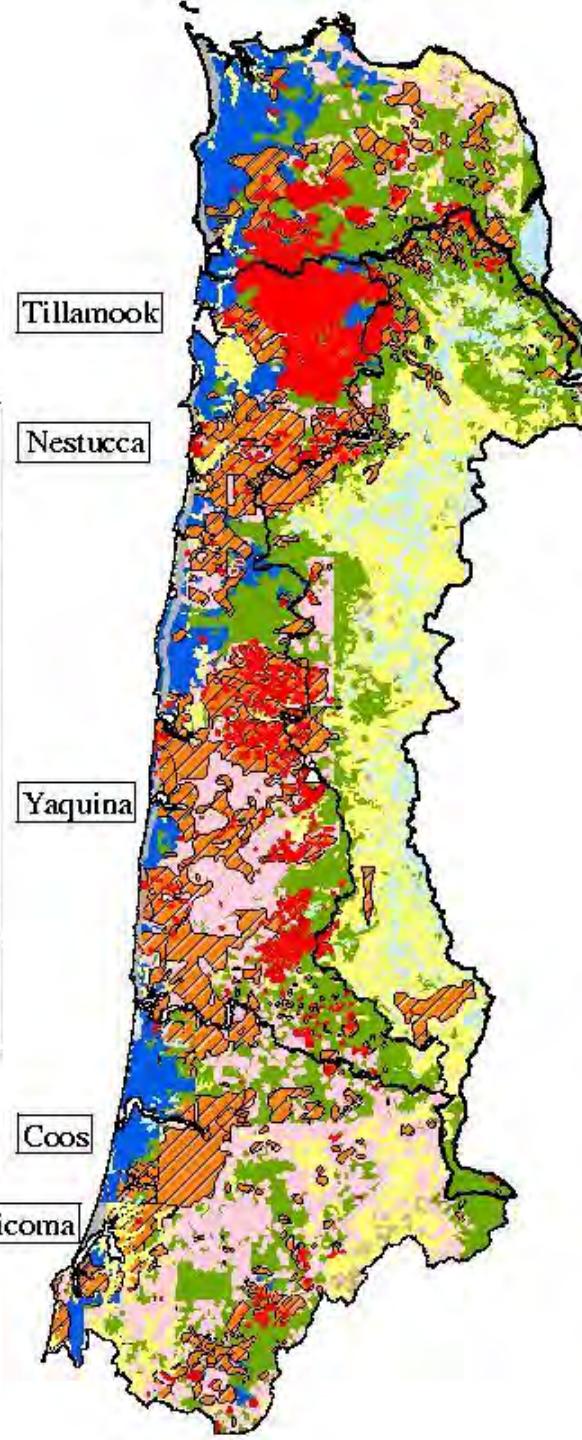


Table 4.01 Historic Oregon Coast Range forest fires, 1750-1951.

Name	Year	Season	Acres	Authority
Millicoma	ca. 1770	Unknown	100,000+	Smyth 2002: 7
Yaquina (1)	1849	Aug./Sep.	500,00	Morris 1934b: 322
Nestucca	1853	Aug./Sep.	480,000	Ballou 2002:67
Yaquina (2)	1868	Aug./Sep.	300,00o	Kirkpatrick 1940:33
Coos	1868	Aug./Sep.	126,00o	Chen 1997: 4
Tillamook (1)	1933	Aug./Sep.	340,000	Ballou 2002: 77
Tillamook (2)	1939		217,000	Chen 1997: 4
Tillamook (3)	1945		181,000	Chen 1997: 4
Tillamook (4)	1951		126,000	Chen 1997: 4

Zybach, Bob. 2003. The Great Fires: Indian Burning and Catastrophic Forest Fire Patterns of the Oregon Coast Range, 1491-1951. Oregon State University, Ph.D. Dissertation.

Taken August 25, 1933 as the Tillamook Burn  
fire "blows up" The smoke column rose eight  
miles high and was seen throughout western  
Oregon and Washington. Oregon

Department of Forestry.

[Cannon Beach History Center and Museum](#)





*Tillamook Fire smoke plume, August 24, 1933. In a single day the 1933 Tillamook Fire increased more than 200,000-acres in size, creating a mushroom cloud 40 miles wide and 8 miles high and producing hurricane-scale winds that furthered the spread of the fire. This cloud was formed largely by water vapor, ash, soil, carbon monoxide, and carbon dioxide in nearly immeasurable amounts and proportions (photo from Portland, Oregon Oregonian, used by permission of the Oregon Department of Forestry).*

[US Wildfire Economics Project:  
Air & Atmospherics \(wildfire-economics.org\)](http://wildfire-economics.org)

A black and white landscape photograph showing a dense forest of tall, thin trees covering a mountain range. The mountains are rugged and layered, receding into the distance under a sky filled with long, wispy clouds.

Oregon State  
Archives

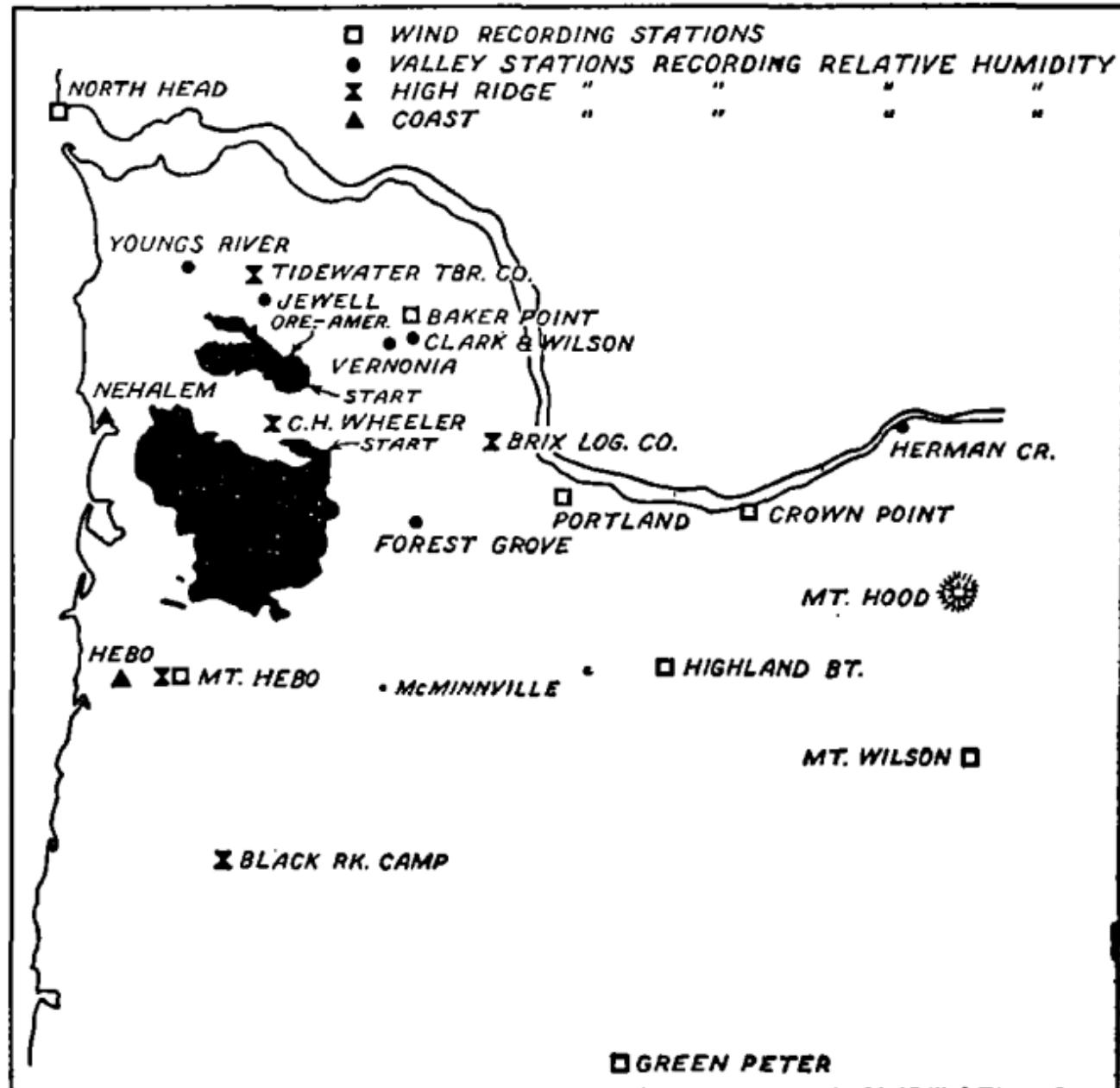
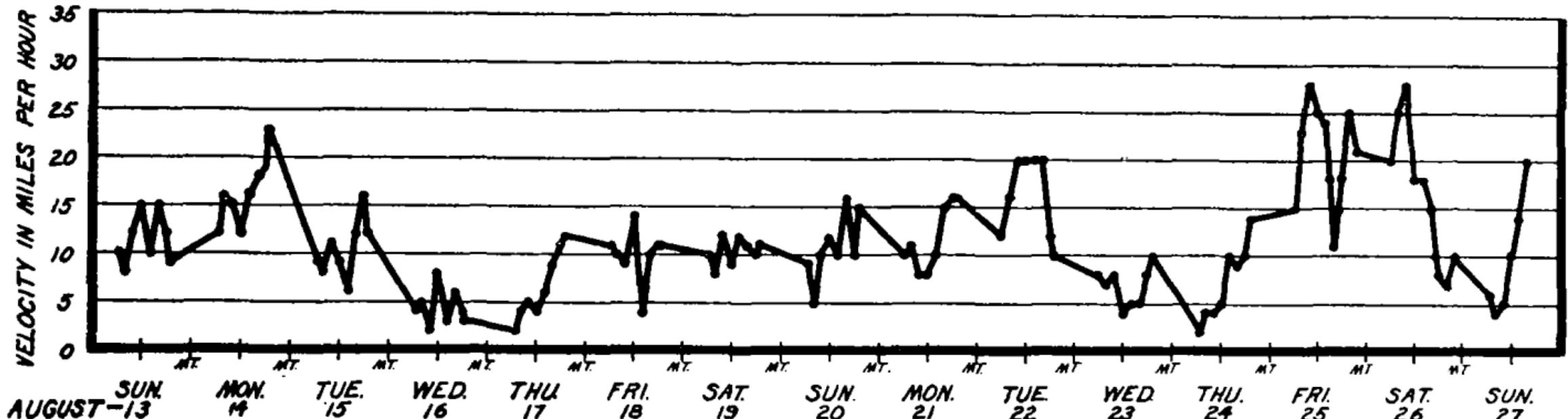


FIGURE 1.—Northwestern Oregon—location of fire, where it started, area covered, and nearest fire-weather stations.

Dague, Charles. 1934. THE WEATHER OF THE GREAT TILLAMOOK, OREG., FIRE OF AUGUST 1933. *Monthly Weather Review* July 1934.

BAKER POINT (1960 FT. ELEV.)

PREVAILED FROM  
N, NE, E, OR SE AS  
INDICATED —

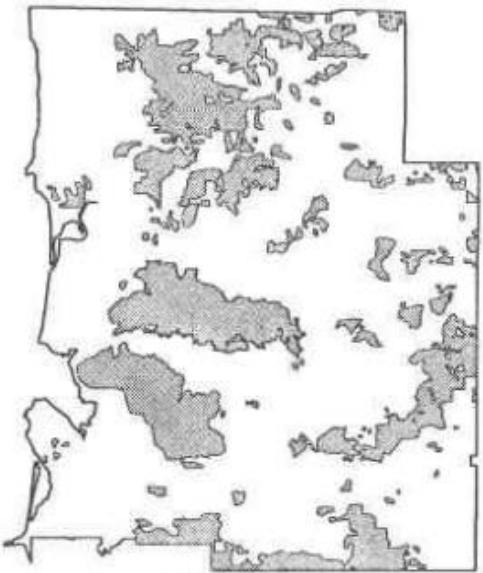


FIRE STARTED ↑  
SPREAD RAPIDLY | SPREAD SLOWLY | FIRE QUIET, SPREAD VERY SLOWLY | SPREAD VERY RAPIDLY | MODERATE SPREAD | PICK UP | BLEW UP | SPREAD VERY SLOWLY

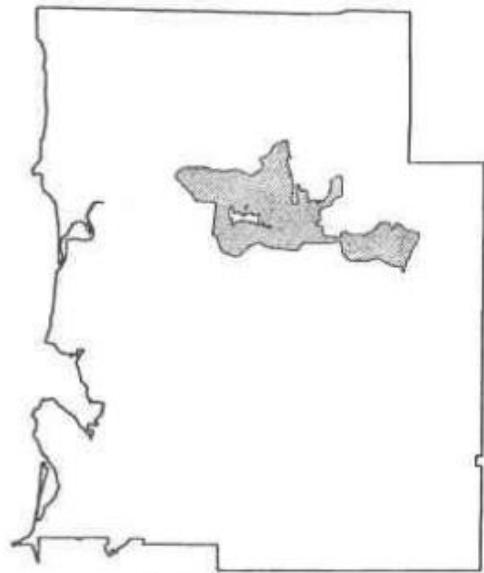
BURNED 225,000  
ACRES IN THIS  
PERIOD

Dague, Charles. 1934. THE WEATHER OF THE GREAT TILLAMOOK, OREG., FIRE OF AUGUST 1933. *Monthly Weather Review* July 1934.

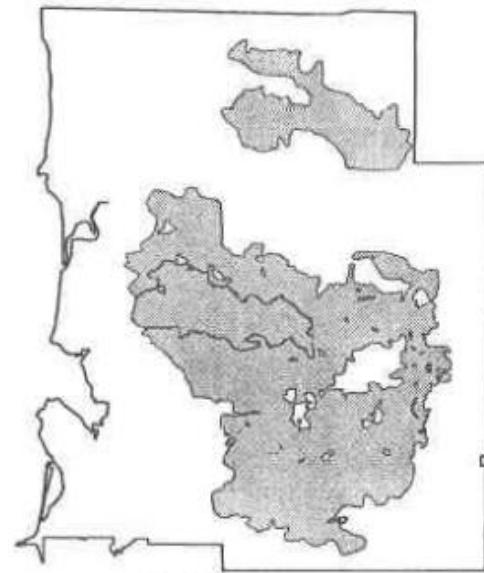
FIGURE 3.—Wind velocities and directions at stations nearest fire.



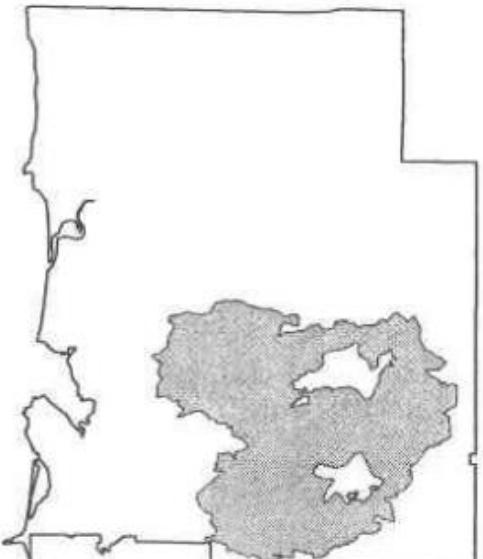
Pre-1929 fires



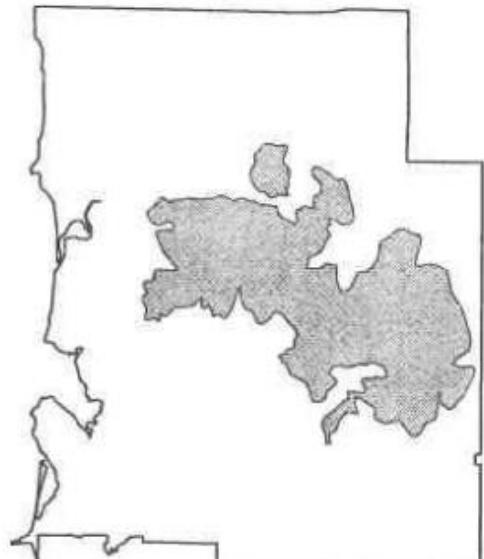
1932 fires



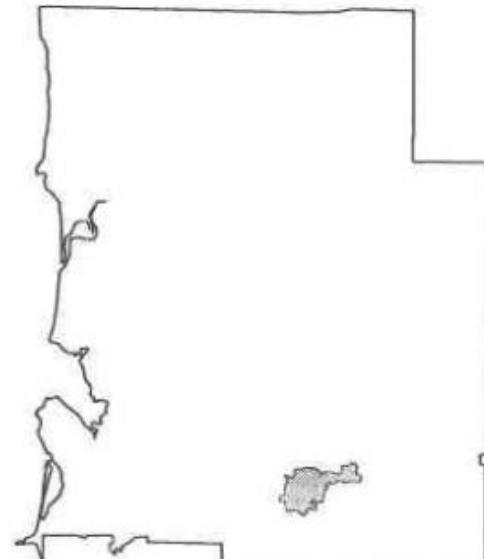
1933 fire



1939 fire



1945 fire

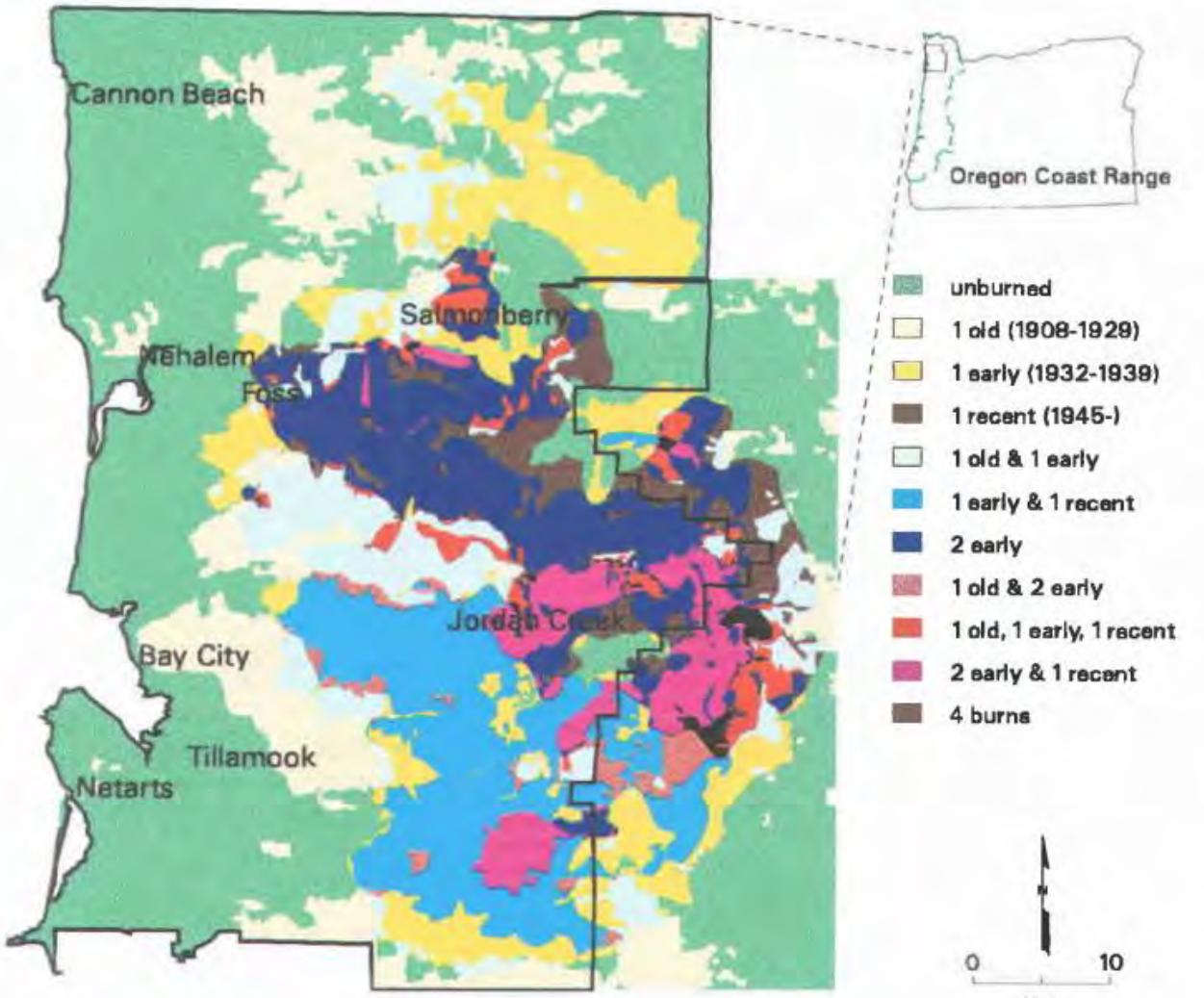


1951 fire

**1945: "Salmonberry Fire"**  
damaged Cook Creek and  
Salmonberry River drainages

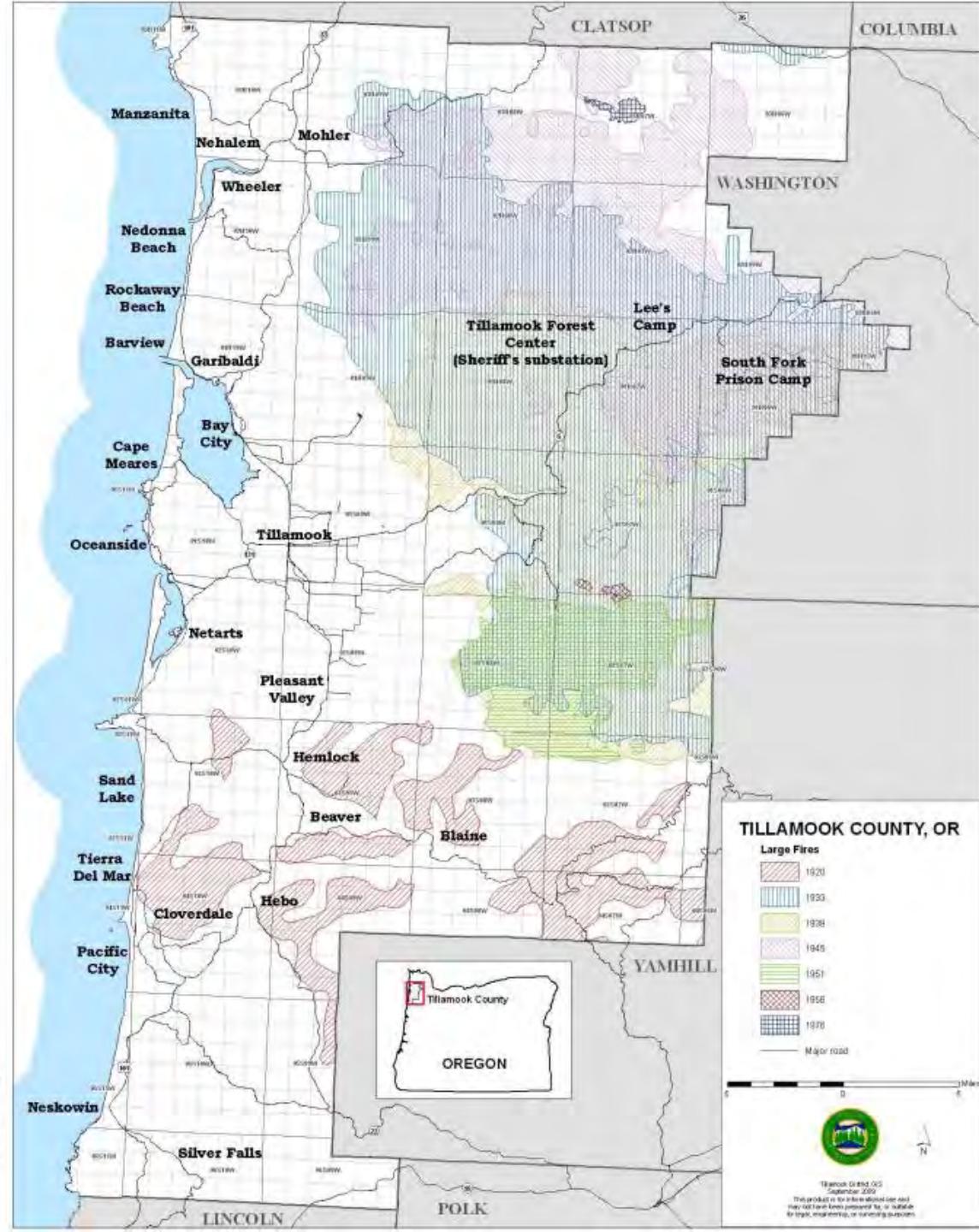
High temperatures, ash fall,  
and subsequent siltation  
impacted aquatic life.

Chen, Shu-Huei. 1997. Title:  
Characterization of Fire Effects on  
Forest Ecosystems in the  
Tillamook Forest, Oregon Master  
of Science Thesis, Oregon State  
University.



Chen, Shu-Huei. 1997. Title: Characterization of Fire Effects on Forest Ecosystems in the Tillamook Forest, Oregon Master of Science Thesis, Oregon State University.

Figure 3.2 Fire occurrence indices (the date and number of fires) between the 1920's and 1951. Most of the burn areas were accounted for by single fire between 1932 and 1939, double fires, and triple fires between 1932 and 1945. Extent within the block was the 1950's forest survey area, i.e., my analysis area.



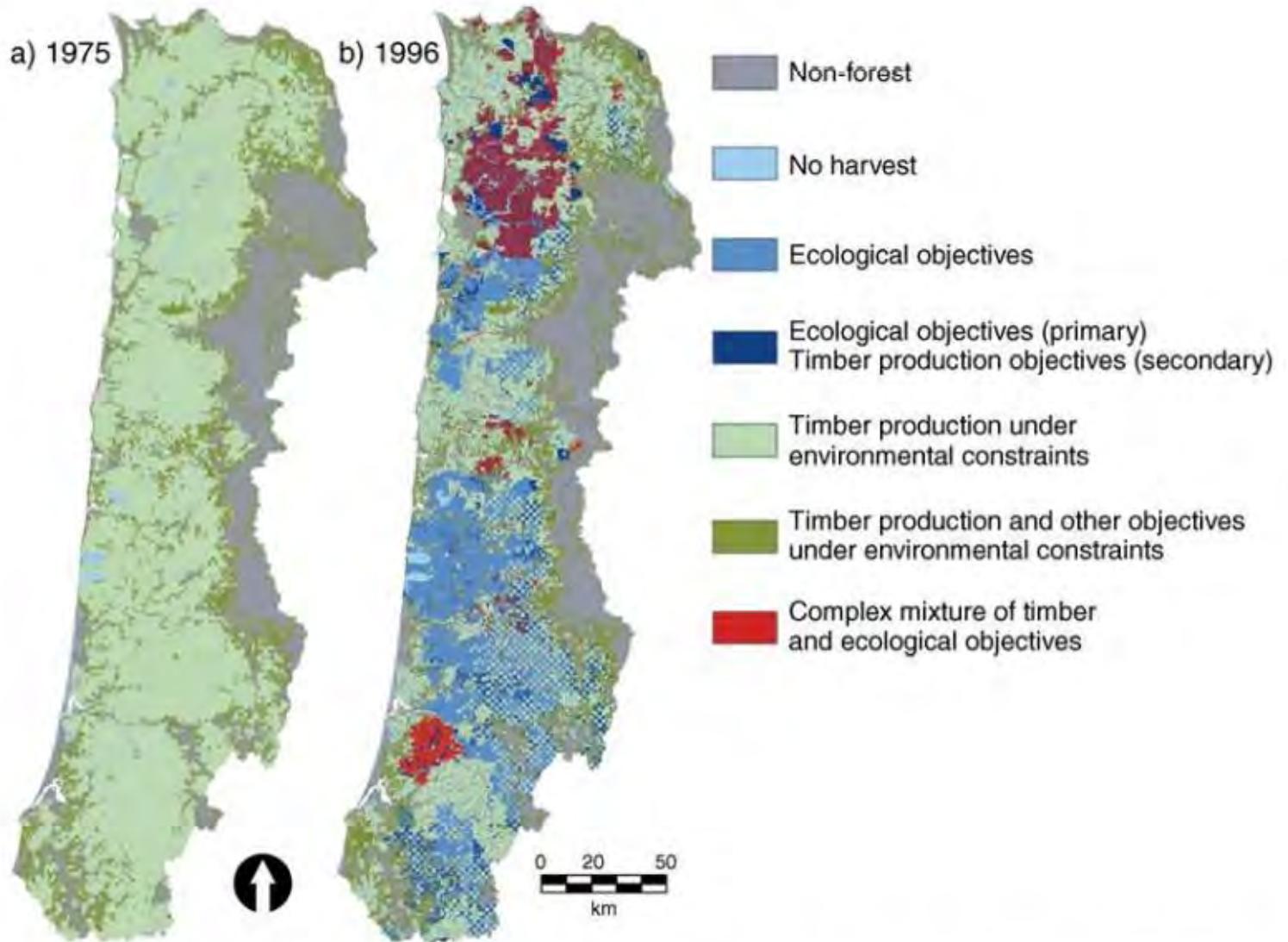


FIG. 3. Management emphases of different ownership groups in the Coast Range over time. (a) In 1975, federal, state, and forest industry owners emphasized timber production under environmental constraints; nonindustrial private owners emphasized timber production and other objectives under environmental constraints. (b) In 1996, federal owners emphasized no harvest, ecological objectives, and ecological objectives (primary)/timber production (secondary); state owners emphasized a complex mixture of timber and ecological objectives; the forest industry emphasized timber production under environmental constraints; nonindustrial private owners emphasized timber production and other objectives under environmental constraints.

K.N. Johnson, et al.  
**SIMULATING FOREST STRUCTURE, TIMBER PRODUCTION, AND SOCIOECONOMIC EFFECTS IN A MULTI-OWNER PROVINCE.**  
*Ecological Applications, 17(1), 2007, pp. 34–47*

# Ownership

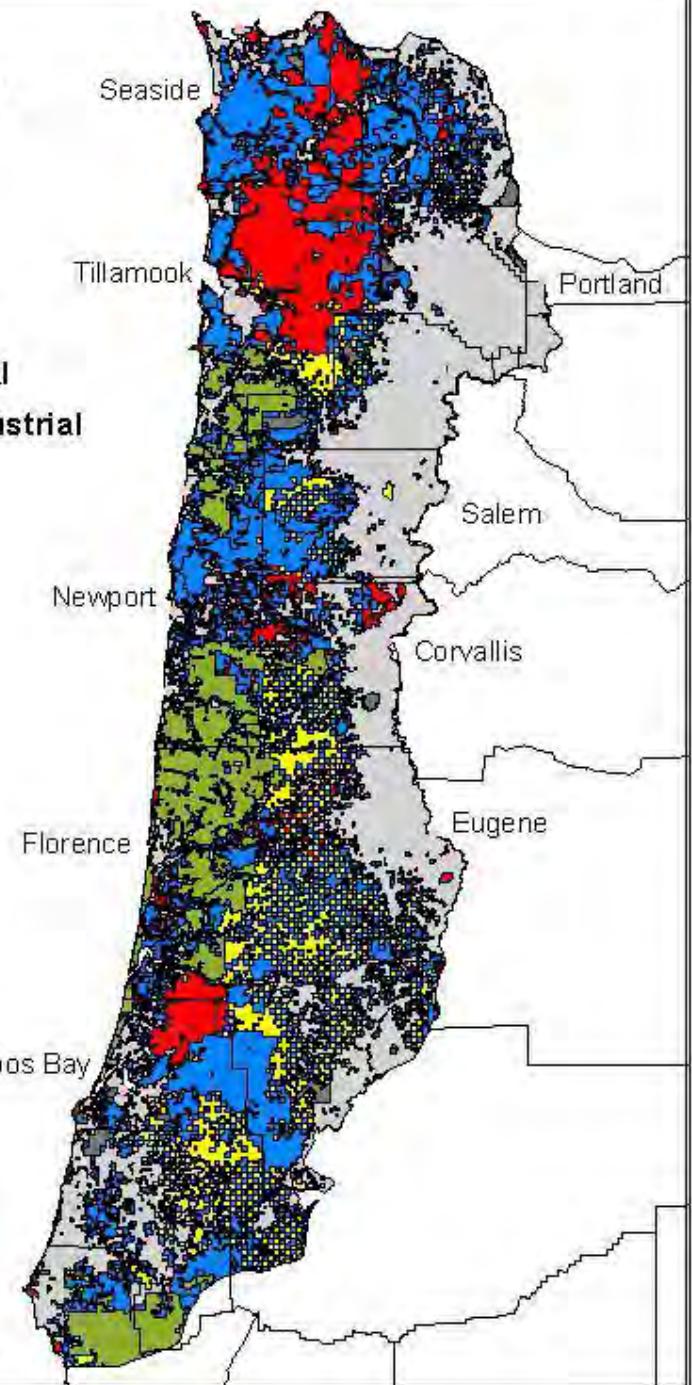
- BLM
- Miscellaneous
- Private Industrial
- Private Non Industrial
- State
- USFS

Source:  
Coastal  
Landscape  
Analysis and  
Modeling  
Study  
(CLAMS)  
[CLAMS Data \(orst.edu\)](http://CLAMS Data (orst.edu))



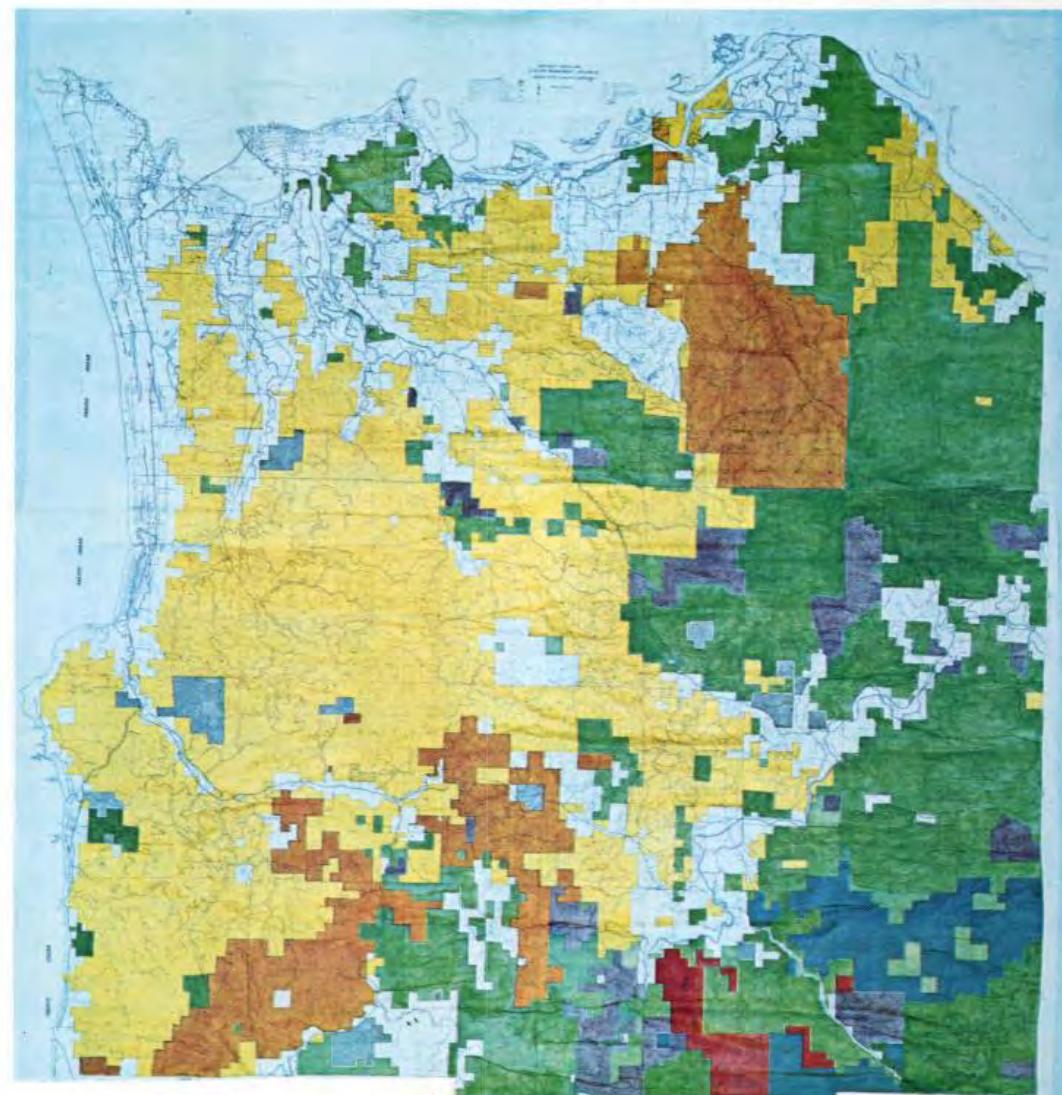
20 0 20 40

Kilometers



## Clatsop Forest Ownership

MAP BY OREGON STATE FORESTRY DEPARTMENT



Source: OSU  
Extension 1968

The Clatsop land area of 515,000 acres is primarily in large forest ownerships totalling over 470,000 acres. Areas along the coastal strip, Columbia River plains, and the river valleys include the urban centers, suburban residences and farmlands. These areas are colorless on the above map and include the smaller forest ownerships of less than 5000 acres.

Colored areas represent the larger forest holdings that are, for the most part, under intensive management for sustained yield. These ownerships, the approximate acre-

ages and color designations are shown on the above map as follows:

Crown Zellerbach Corporation, 171,000 acres	Yellow
Oregon State Forestry Department, 147,000 acres	Green
Boise Cascade, 51,000 acres	Brown
Longview Fiber, 14,000 acres	Purple
International Paper, 13,000 acres	Dark blue
Ruth Realty, 5,000 acres	Red
Publishers Paper, 5,000 acres	Light blue

# III. Fire in the Nehalem Watershed/

1 feature(s) selected

Protection Map Sheet Index: Northwest Oregon

Protection\_Map Northwest Oregon

Protection\_Map\_Sheet North

Protection\_District Northwest Oregon

Map\_Year 2,019

PDF Maps [More info](#)

Legend

**Protection Map Sheets**

Protection Map Sheet Index

Wildlife Management Units

County

[Protection Map Sheets \(oregon.gov\)](#)

Refuge

WASHINGTON

Wahkiakum

Silver Lake

Longview

WASHINGTON

OREGON

8336 ft

Swif Reserv

Cowlitz

Kalama River

Lake Merwin

Yale Lake

Clark

Vancouver

Portland

Gresham

North Cascade North

Willamette

Santiam

COASTAL RANGES

Trask

Tillamook

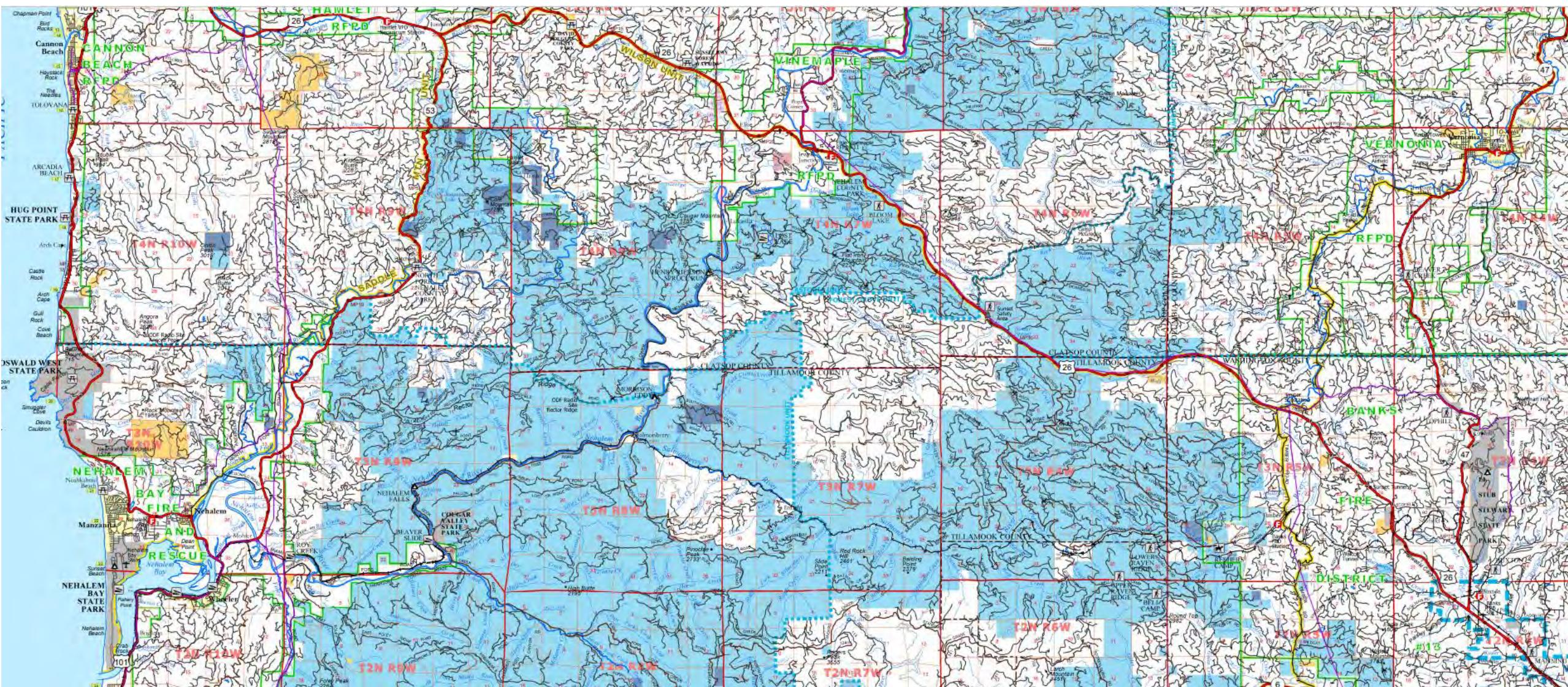
Hillsboro

Beaverton

20km

10mi

Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS





# Interactive Viewer - Monitoring Trends in Burn Severity Nehalem Watershed



**Step 1 Region Selector**  
Continental U.S.

**Step 2 Area Selector**

**Step 3 Date Range (1984-2019)**  
1984      2019

**Step 4 Filter by fire type**  
Select Fire Type

**25,249 Matching Fires**  
Region: Continental U.S.  
Years: 1984 to 2019

**Reset**

**Query Layers**

- Fire Polygons
- Fire Points
- Yearly Burn Severity
- Boundaries

  - States
  - Counties
  - Watersheds

- Base Layers

  - ESRI World Imager
  - OpenStreetMap

**Fire Data Download Instructions**

1. Select a region
2. Select area of interest
  - a. Select bounding box area
  - b. Refine by state, county, or watershed using the select

**Fire Bundle Downloads**

MTBS: all fires **1000 acres or greater in the western United States** and **500 acres or greater in the eastern United States**.

ODF District	Astoria			Tillamook			
Years	Total Fires	ODF acres	Total acres		Total Fires	ODF acres	Total acres
1960-1969	169	160.5	160.5		149	195.2	195.2
1970-1979	220	804.7	804.7		167	1224.2	1224.2
1980-1989	352	726.6	726.6		228	594.2	594.2
1990-1999	214	145.81	151.6		190	127.48	127.93
2000-2009	170	201.24	202.84		170	253.68	255.3
2010-2019	190	581.45	582.14		87	15.67	16.93
2020-2021	19	1.99	2.9		9	311.36	311.46
Totals	1334	2622.29	2631.28		1000	2721.79	2725.22

Fire Information Provided by ODF's Fires program. Prior to 1960 Tillamook County witnessed several large fires, four of those being the series of fires known as the Tillamook Burn.

Notable Fires:

July 25, 2006:	Spring Creek Fire	East of Rockaway Beach	35 Acres
November 26, 2002:	Bay Overlook Fire		46 Acres
November 29, 2002:	Butte Creek Fire	NE of Neskowin	45 Acres
	Blue Lake Fire		45 Acres
September 20, 1995:	Steampot Fire		30 Acres
October 15, 1986:	Prouty Creek Fire	Tributary of Miami River	105 Acres
October 2, 1976:	Cronin Creek Fire		834 Acres
October 29, 1970:	Smith Creek Fire	Tillamook Bay	202 Acres
September 21, 1951:	Edwards Creek Fire		33,000 Acres total
July 20, 1951:	Elkhorn Fire		
April 23, 1951:	North Fork Trask Fire		(the Edwards Fire was a rekindle of the July fire; all of the acreage had been burned in the previous large fires)
July 11, 1945:	Wilson River Fire		180,000 Acres total
July 9, 1945:	Salmonberry		(the two fires burned together, much of the land had already been burned in the previous fires, only 65,150 new additional acres)
August 1, 1939:	Saddle Mountain Fire		190,000 Acres total
	(much of the land had already been burned in the Tillamook Fire, only 50,091 new additional acres)		
August 14, 1933:	Tillamook Fire		240,000 Acres

# Total Fires in Washington and Columbia Counties

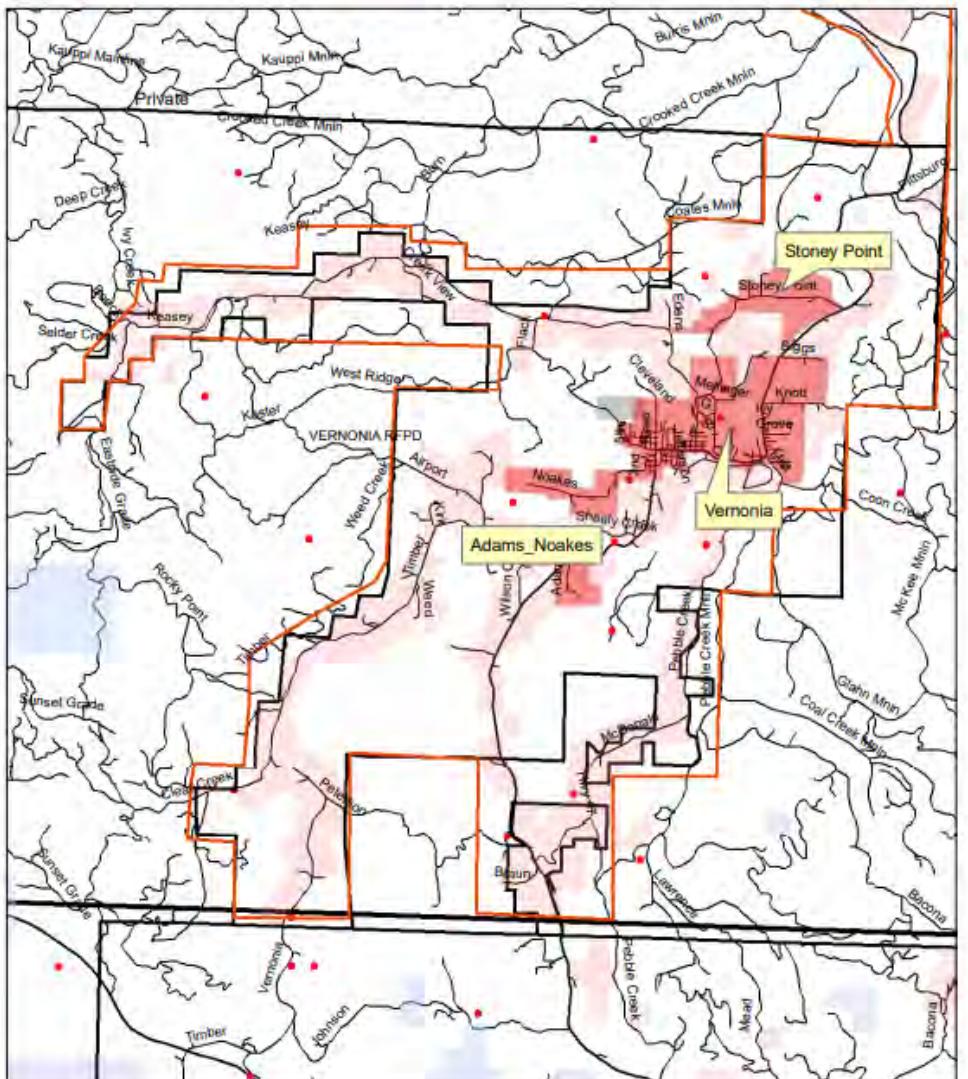
Washington County				Columbia County			
Years	Total Fires	ODF acres burned	total acres burned	Total Fires	ODF acres burned	total acres burned	
1960-1969	177	184.35	184.35	177	184.35	184.35	
1970-1979	131	33.95	33.95	131	33.95	33.95	
1980-1989	117	273.9	273.9	117	273.9	273.9	
1990-1999	150	102.3	114.2	150	102.3	114.2	
2000-2009	106	126.87	147.7	106	126.87	147.7	
2010-2019	88	345.93	413.84	88	345.93	413.84	
2020-2021	11	11	11.1	11	11	11.1	
Totals	780	1078.3	1179.04	780	1078.3	1179.04	

Source: ODF, Washington and Columbia Counties, [Oregon Department of Forestry - FIRES List](#)

Columbia County Community Wildfire Protection Plan  
Vernonia RFPD CAR



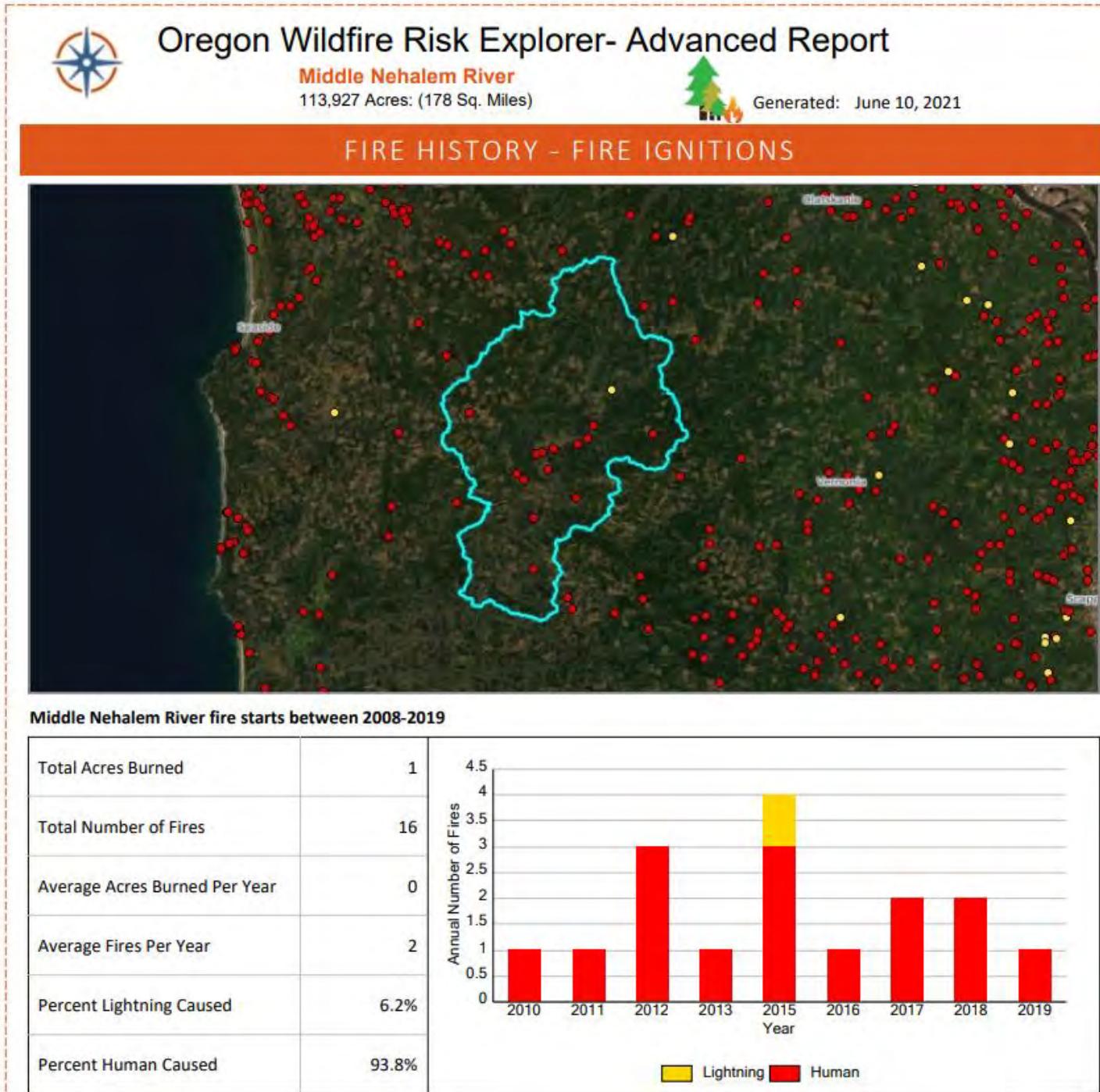
<span style="background-color: red; border: 1px solid black; padding: 2px;"> </span> Priority Areas	<span style="border: 1px solid orange; padding: 2px;"> </span> WUI Boundary	<span style="background-color: pink; border: 1px solid black; padding: 2px;"> </span> Community at Risk
<span style="border: 1px solid black; padding: 2px;"> </span> RFPD Boundary	<span style="background-color: tan; border: 1px solid black; padding: 2px;"> </span> Federal	
<span style="color: red; font-size: small;">●</span> Stat_Fires 94-05	<span style="background-color: lightblue; border: 1px solid black; padding: 2px;"> </span> State	



**Recent Large Fires in Columbia County and Vicinity:**

<b>Fire Name</b>	<b>Location</b>	<b>Size (Acres)</b>	<b>Fuel Type</b>	<b>w/i WUI</b>	<b>Year</b>	<b>Cause Category</b>	<b>Vicinity of Homes</b>
Scappoose Airport	Scappoose Airport	200	Grass/Agriculture	Yes	2000	Burning	Yes
Pebble Creek	South of Vernonia	165	Logging Slash/Timber	Yes	1987	Hunter/Smoking	Yes
Keasey Dam	West of Vernonia	117	Logging Slash Reproduction.	No	1989	Recreationist/Campfire	No
Emerald Forest		37	Logging Slash	No	1994	Equipment/Logging	Yes
Kerry Road	West of Clatskanie	31	Fell/Buck, Slash, Reproduction			Equipment/Logging	No
Wolden Road		31	Reproduction	Yes	1999	Debris Burning	Yes
Lost Creek Road		20	Reproduction	Yes	1999	Debris Burning	Yes
Stone Road	West of St. Helens	5	Logging Slash	Yes	1995	Burning	Yes
Pittsburg Road	South of Liberty Hill	5	Scrub Oak/Grass	Yes	2006	Recreationist/unknown	Yes

# Middle Nehalem



NOTE: This definition of the Lower Nehalem does not correspond to the Watershed Council boundaries. The Nehalem is divided: North Fork, Lower, **Middle, Upper, and Headwaters**

Source: Middle Nehalem Watershed. Accessed from the Oregon Wildfire Risk Explorer on June 10, 2021 URL:[https://tools.oregonexplorer.info/OE\\_HtmlViewer/index.html?viewer=wildfireplanning](https://tools.oregonexplorer.info/OE_HtmlViewer/index.html?viewer=wildfireplanning) Primary data Source: USDA Forest Service Pacific Northwest Quantitative Wildfire Risk Assessment (2018)



## Oregon Wildfire Risk Explorer- Advanced Report

Middle Nehalem River  
113,927 Acres: (178 Sq. Miles)



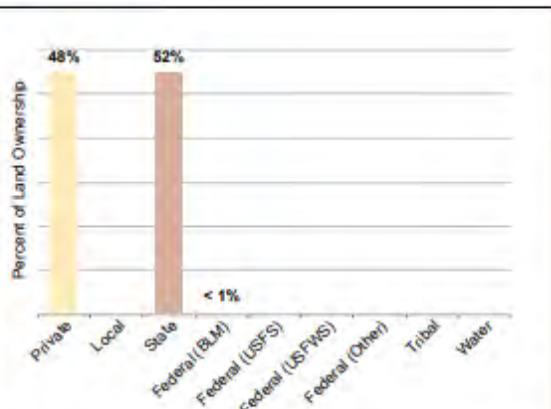
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### LAND OWNERSHIP AND MANAGEMENT



Middle Nehalem River

Major Landowner/Manager	Acres
Private	54,745
Local	0
State	59,102
Bureau of Land Management (BLM)	80
US Forest Service (USFS)	0
US Fish & Wildlife (USFWS)	0
Other Federal	0
Tribal	0
Water	0



Source: Bureau of Land Management, 2015

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



# Oregon Wildfire Risk Explorer- Advanced Report

**Middle Nehalem River**  
113,927 Acres: (178 Sq. Miles)



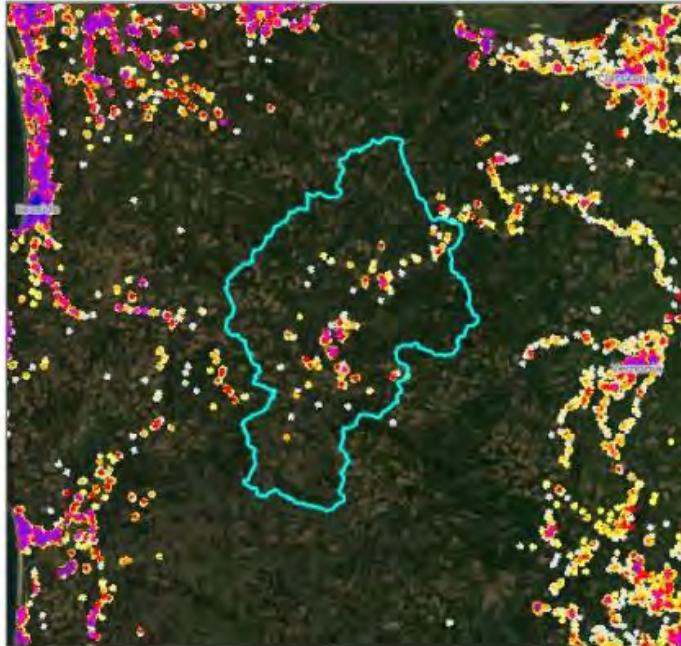
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## HOUSING DENSITY - WHERE PEOPLE LIVE

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.



**Middle Nehalem River housing density**

Category	Acres	%*
< 1 house per 40 acres	1,945	2
1 per 40 acres to 1 per 20 acres	1,049	< 1
1 per 20 acres to 1 per 10 acres	1,154	1
1 per 10 acres to 1 per 5 acres	764	< 1
1 per 5 acres to 1 per 2 acres	419	< 1
1 per 2 acres to 3 per acres	70	< 1
> 3 per acres	0	0

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

**Middle Nehalem River**  
113,927 Acres: (178 Sq. Miles)



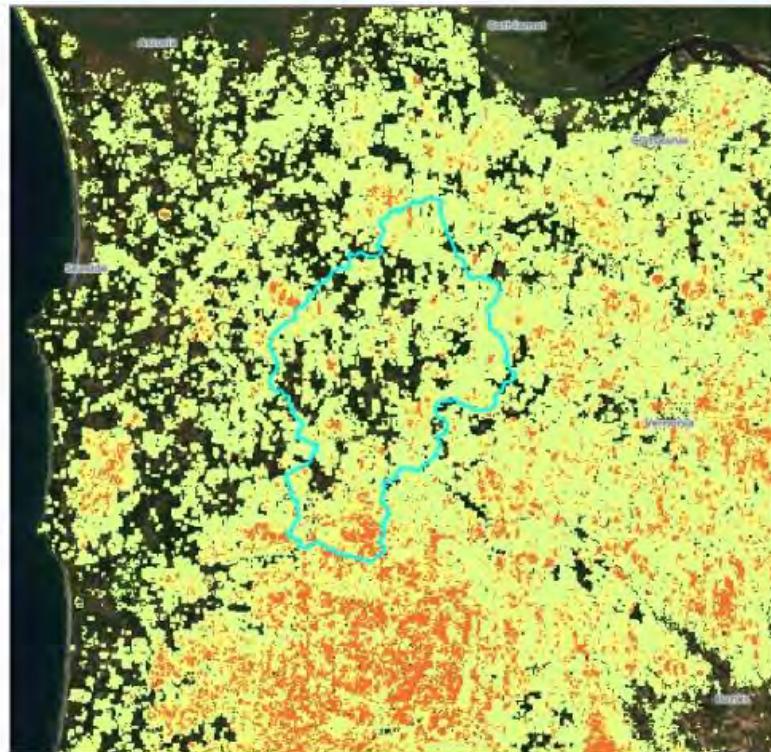
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## FIRE INTENSITY - FLAME LENGTHS

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**

<span style="color: #c8512e;">■</span> > 11 foot	Fires may exhibit greater than 11-foot average flames with major fire movement, tree crowning, longer-range spotting and ember travel.
<span style="color: #fca82e;">■</span> 8-11 foot	Fires may exhibit 8-11 foot average flames with tree torching and increased ember travel.
<span style="color: #ffeb3b;">■</span> 4-8 foot	Fires may exhibit 4-8 foot average flames, and embers may travel moderate distances.
<span style="color: #90ee90;">■</span> 4 foot	Fires may exhibit 4 foot average flames.
<span style="color: #d9eaf7;">■</span> Non-burnable	This area contains non-burnable fuel types such as water, urban, agriculture, barren rock, etc.

Source: Middle Nehalem Watershed. Accessed from the Oregon Wildfire Risk Explorer on June 10, 2021  
URL:[https://tools.oregonexplorer.info/OE\\_HtmIViewer/index.html?view=wildfireplanning](https://tools.oregonexplorer.info/OE_HtmIViewer/index.html?view=wildfireplanning)  
Primary data Source: USDA Forest Service Pacific Northwest Quantitative Wildfire Risk Assessment (2018)



# Oregon Wildfire Risk Explorer- Advanced Report

Middle Nehalem River

113,927 Acres: (178 Sq. Miles)



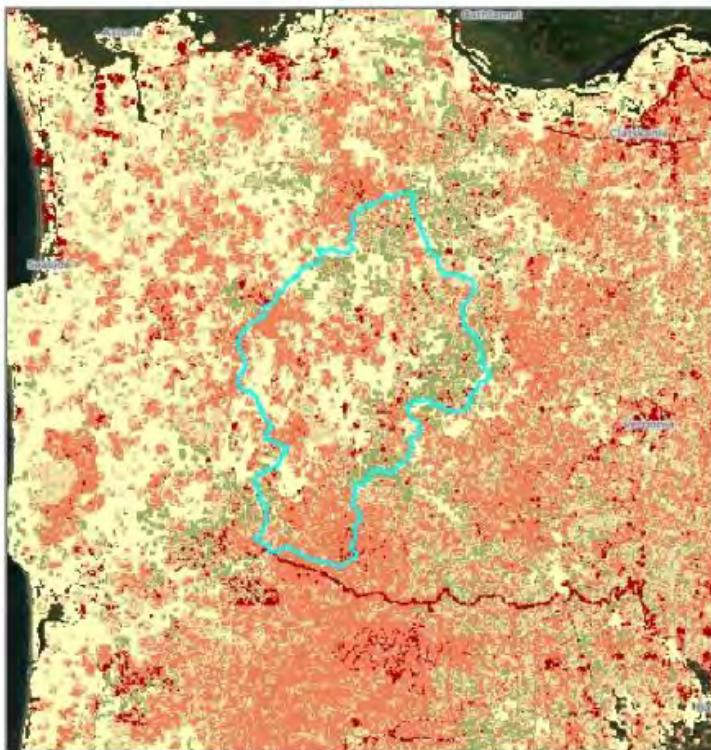
Generated: June 10, 2021

## 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)

<span style="color: darkred;">■</span>	Very High	Overall potential impact is very highly negative (top 5% of values).
<span style="color: orange;">■</span>	High	Overall potential impact is highly negative (80-95th percentile).
<span style="color: yellow;">■</span>	Moderate	Overall potential impact is moderately negative (50-80th percentile).
<span style="color: lightyellow;">■</span>	Low	Overall potential impact is slightly negative (30-50th percentile).
<span style="color: lightgreen;">■</span>	Low Benefit	Overall potential impact is slightly beneficial at low flame lengths (15-30th percentile).
<span style="color: green;">■</span>	Benefit	Overall potential impact is slightly beneficial, with a cumulative positive impact of fire (0-15th percentile).
<span style="color: white;">■</span>	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

Middle Nehalem River

113,927 Acres: (178 Sq. Miles)



Generated: June 10, 2021

## Middle Nehalem River vegetation type

Category	Description	Acres	%*
<span style="background-color: white; border: 1px solid black;"></span>	Non-vegetated or recently disturbed	135	< 1
<span style="background-color: brown;"></span>	Agricultural	1,594	1
<span style="background-color: green;"></span>	Conifer	90,092	79
<span style="background-color: blue;"></span>	Conifer-Hardwood	< 1	< 1
<span style="background-color: black;"></span>	Developed	2,341	2
<span style="background-color: pink;"></span>	Exotic Herbaceous	0	0
<span style="background-color: orange;"></span>	Grassland	314	< 1
<span style="background-color: lightgreen;"></span>	Hardwood	14,653	13
<span style="background-color: cyan;"></span>	Riparian	4,797	4
<span style="background-color: yellow;"></span>	Shrubland	1	< 1
<span style="background-color: purple;"></span>	Sparingly Vegetated	0	0

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](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

Source: Middle Nehalem Watershed. Accessed from the Oregon Wildfire Risk Explorer on June 10, 2021 URL:[https://tools.oregonexplorer.info/OE\\_HtmlViewer/index.html?viewer=wildfireplanning](https://tools.oregonexplorer.info/OE_HtmlViewer/index.html?viewer=wildfireplanning)  
Primary data Source: USDA Forest Service Pacific Northwest Quantitative Wildfire Risk Assessment (2018)

# Upper Nehalem



## Oregon Wildfire Risk Explorer- Advanced Report

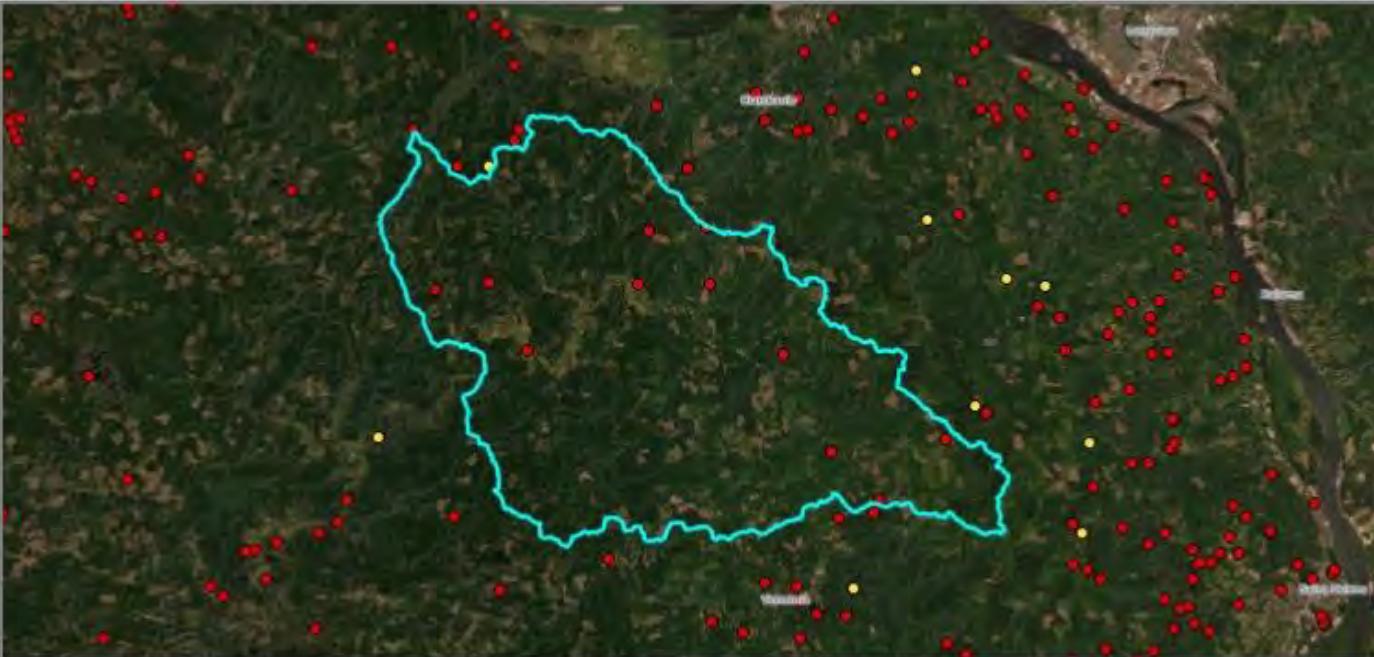
Upper Nehalem River

112,614 Acres: (176 Sq. Miles)

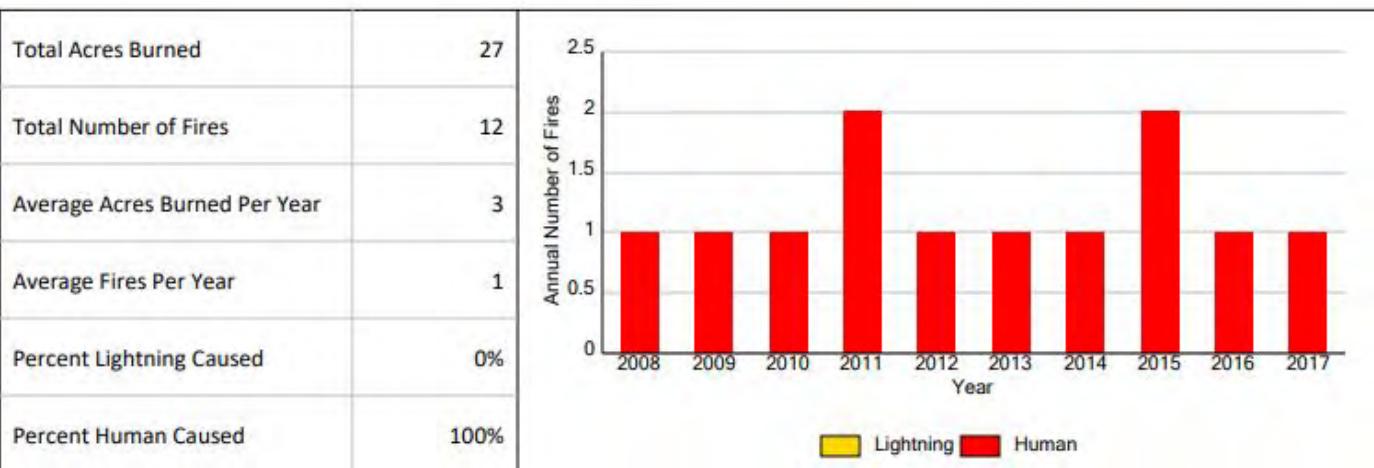


Generated: June 14, 2021

### FIRE HISTORY - FIRE IGNITIONS



Upper Nehalem River fire starts between 2008-2019





# Oregon Wildfire Risk Explorer- Advanced Report

Upper Nehalem River

112,614 Acres: (176 Sq. Miles)



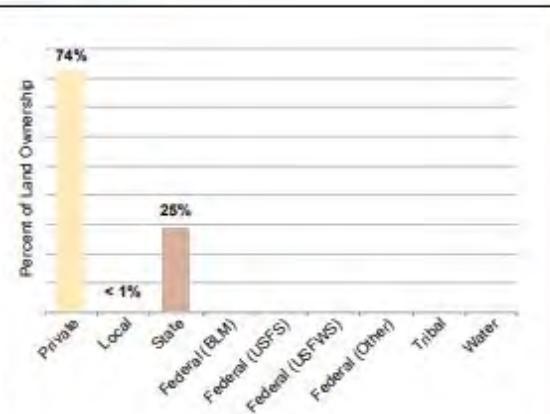
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## LAND OWNERSHIP AND MANAGEMENT



Upper Nehalem River

Major Landowner/Manager	Acres
Private	83,678
Local	346
State	28,589
Bureau of Land Management (BLM)	0
US Forest Service (USFS)	0
US Fish & Wildlife (USFWS)	0
Other Federal	0
Tribal	0
Water	0



Source: Bureau of Land Management, 2015

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# Oregon Wildfire Risk Explorer- Advanced Report



**Upper Nehalem River**  
112,614 Acres: (176 Sq. Miles)



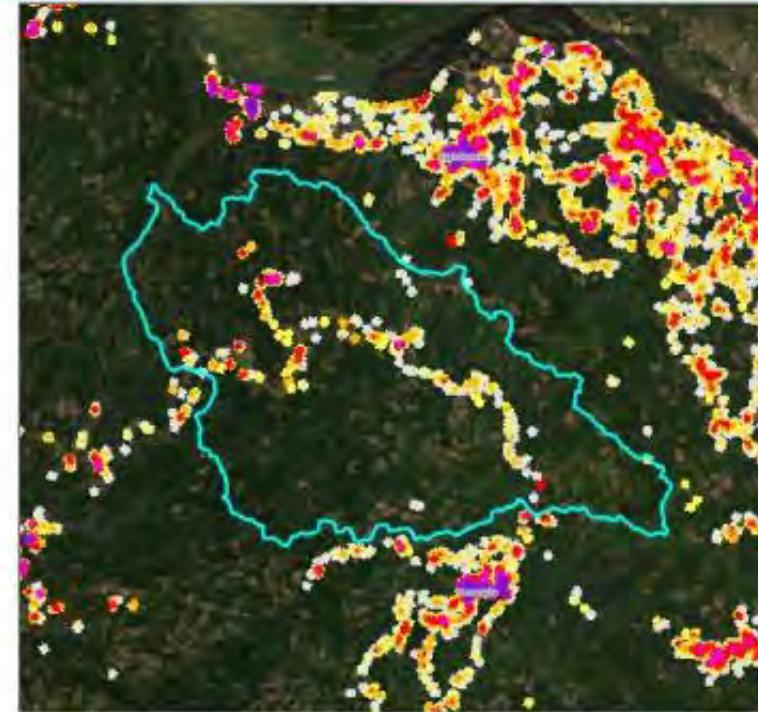
Generated: June 14, 2021

## HOUSING DENSITY - WHERE PEOPLE LIVE

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



### Upper Nehalem River housing density

#### Category

Category	Acres	%*
<1 house per 40 acres	2,823	3
1 per 40 acres to 1 per 20 acres	1,982	2
1 per 20 acres to 1 per 10 acres	1,279	1
1 per 10 acres to 1 per 5 acres	592	< 1
1 per 5 acres to 1 per 2 acres	148	< 1
1 per 2 acres to 3 per acres	8	< 1
> 3 per acres	0	0

Source: 2013 West Wide Wildfire Risk Assessment, ODF

# Oregon Wildfire Risk Explorer- Advanced Report



**Upper Nehalem River**  
112,614 Acres: (176 Sq. Miles)



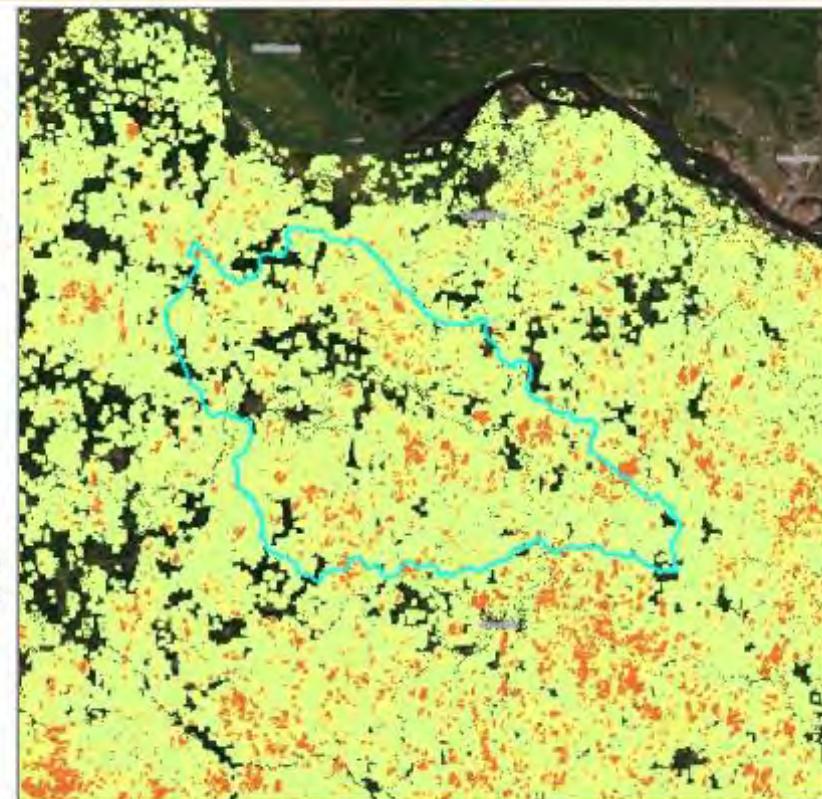
Generated: June 14, 2021

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<span style="color: #ff9933;">■</span> 8-11 foot	Fires may exhibit 8-11 foot average flames with tree torching and increased ember travel.
<span style="color: #ffffcc;">■</span> 4-8 foot	Fires may exhibit 4-8 foot average flames, and embers may travel moderate distances.
<span style="color: #99ff99;">■</span> 4 foot	Fires may exhibit 4 foot average flames.
<span style="color: #cccccc;">■</span> Non-burnable	This area contains non-burnable fuel types such as water, urban, agriculture, barren rock, etc.



# Oregon Wildfire Risk Explorer- Advanced Report

**Upper Nehalem River**  
112,614 Acres: (176 Sq. Miles)



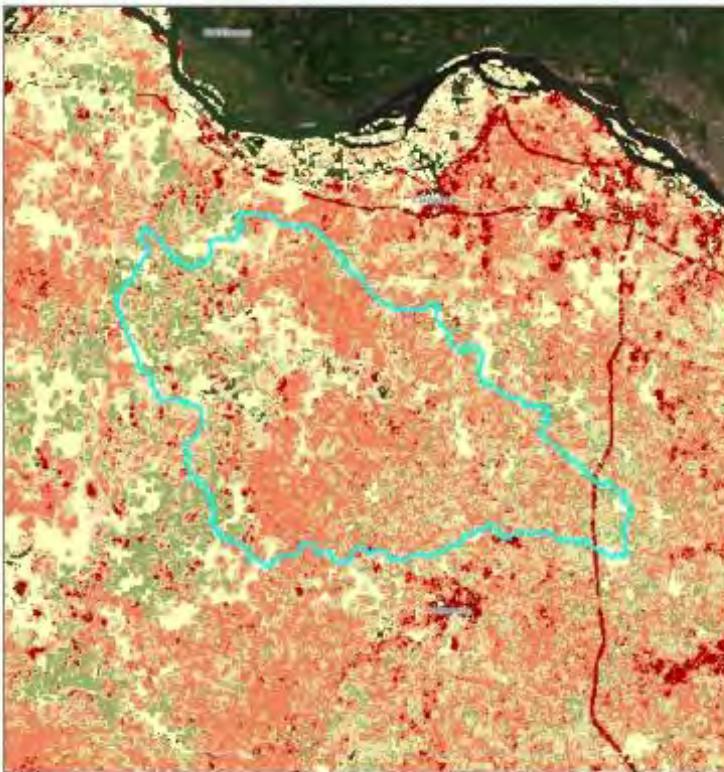
Generated: June 14, 2021

## 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)

<span style="color: darkred;">■</span>	Very High	Overall potential impact is very highly negative (top 5% of values).
<span style="color: orange;">■</span>	High	Overall potential impact is highly negative (80-95th percentile).
<span style="color: yellow;">■</span>	Moderate	Overall potential impact is moderately negative (50-80th percentile).
<span style="color: lightgreen;">■</span>	Low	Overall potential impact is slightly negative (30-50th percentile).
<span style="color: limegreen;">■</span>	Low Benefit	Overall potential impact is slightly beneficial at low flame lengths (15-30th percentile).
<span style="color: mediumseagreen;">■</span>	Benefit	Overall potential impact is slightly beneficial, with a cumulative positive impact of fire (0-15th percentile).
<span style="color: white;">■</span>	No Data (blank)	There are no highly valued resources or assets mapped in the area or it is non-burnable (urban, agriculture, barren,etc).



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## Upper Nehalem River vegetation type

Category	Description	Acres	%*
<span style="background-color: #f0f0f0;">■</span>	Non-vegetated or recently disturbed	89	< 1
<span style="background-color: #808040;">■</span>	Agricultural	2,579	2
<span style="background-color: #008000;">■</span>	Conifer	90,993	81
<span style="background-color: #0000ff;">■</span>	Conifer-Hardwood	< 1	< 1
<span style="background-color: #333333;">■</span>	Developed	1,578	1
<span style="background-color: #ff8080;">■</span>	Exotic Herbaceous	0	0
<span style="background-color: #ffd700;">■</span>	Grassland	1,335	1
<span style="background-color: #9acd32;">■</span>	Hardwood	10,587	9
<span style="background-color: #00ffff;">■</span>	Riparian	5,455	5
<span style="background-color: #ffff00;">■</span>	Shrubland	4	< 1
<span style="background-color: #9370DB;">■</span>	Sparingly Vegetated	0	0

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](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

# Headwaters Nehalem



## Oregon Wildfire Risk Explorer- Advanced Report

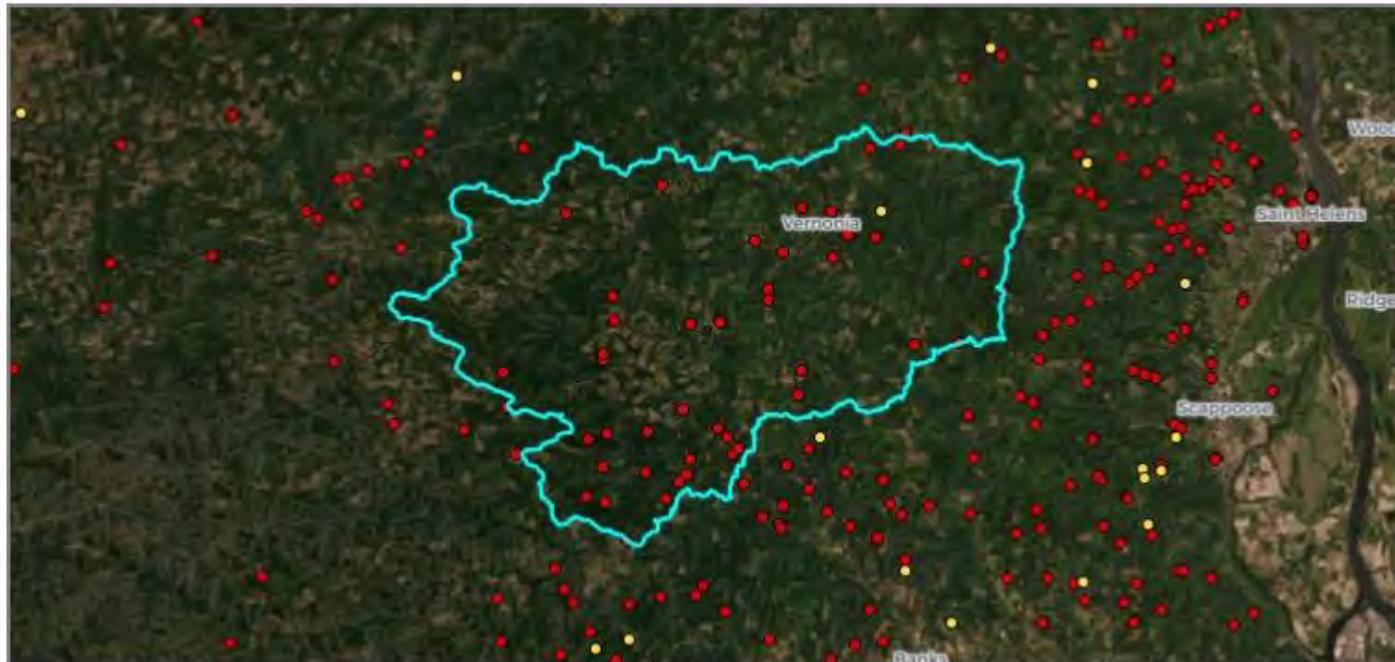
Headwaters Nehalem River

142,703 Acres: (223 Sq. Miles)



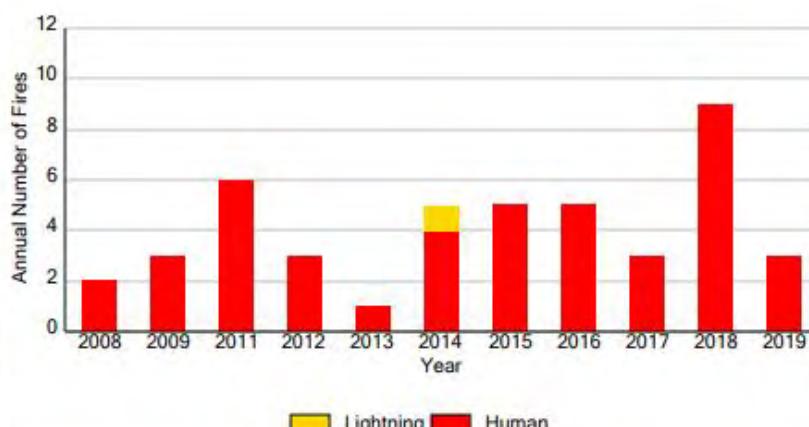
Generated: June 14, 2021

### FIRE HISTORY - FIRE IGNITIONS



Headwaters Nehalem River fire starts between 2008-2019

Total Acres Burned	127
Total Number of Fires	45
Average Acres Burned Per Year	13
Average Fires Per Year	4
Percent Lightning Caused	2.2%
Percent Human Caused	97.8%



Source: Headwaters Nehalem Watershed. Accessed from the Oregon Wildfire Risk Explorer on June 14, 2021  
URL:[https://tools.oregonexplorer.info/OE\\_HtmlViewer/index.html?viewer=wildfireplanning](https://tools.oregonexplorer.info/OE_HtmlViewer/index.html?viewer=wildfireplanning)  
Primary data Source: USDA Forest Service Pacific Northwest Quantitative Wildfire Risk Assessment (2018)



# Oregon Wildfire Risk Explorer- Advanced Report

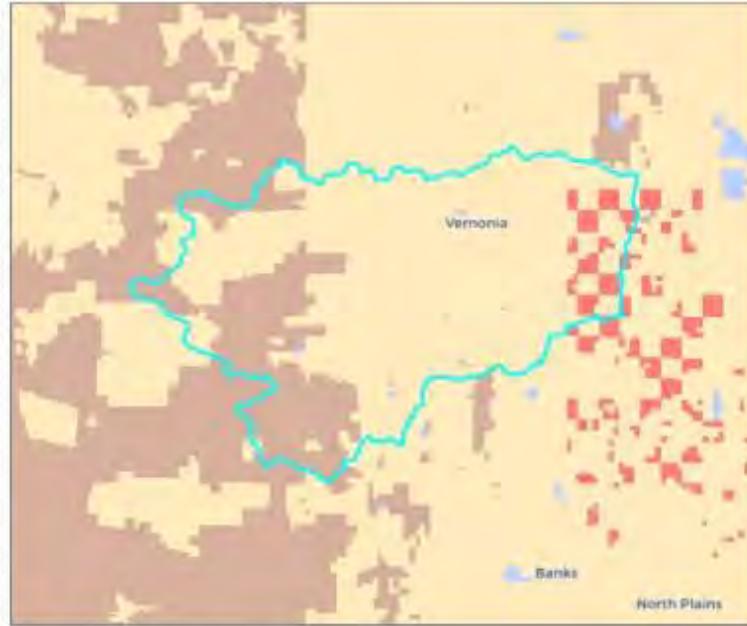
Headwaters Nehalem River

142,703 Acres: (223 Sq. Miles)



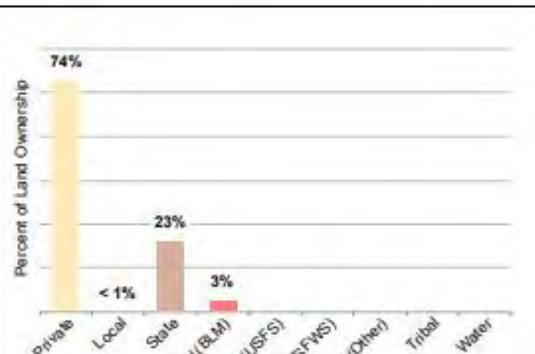
Generated: June 14, 2021

## LAND OWNERSHIP AND MANAGEMENT



Headwaters Nehalem River

Major Landowner/Manager	Acres
Private	105,636
Local	223
State	32,268
Bureau of Land Management (BLM)	4,577
US Forest Service (USFS)	0
US Fish & Wildlife (USFWS)	0
Other Federal	0
Tribal	0
Water	0



Source: Bureau of Land Management, 2015

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



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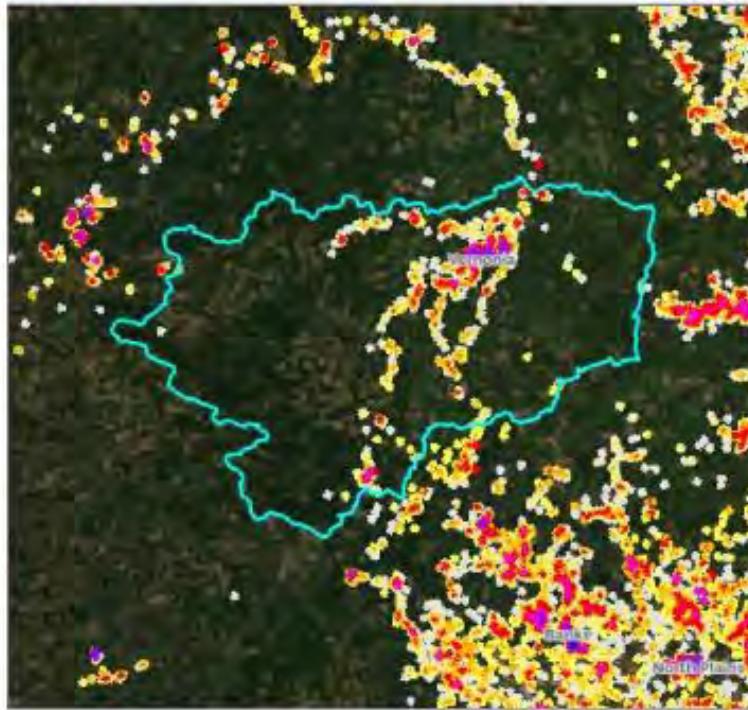
Generated: June 14, 2021

## 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.



### Headwaters Nehalem River housing density

Category		Acres	%*
<1 house per 40 acres		4,663	3
1 per 40 acres to 1 per 20 acres		3,229	2
1 per 20 acres to 1 per 10 acres		2,717	2
1 per 10 acres to 1 per 5 acres		1,380	< 1
1 per 5 acres to 1 per 2 acres		666	< 1
1 per 2 acres to 3 per acres		712	< 1
> 3 per acres		0	0

Source: 2013 West Wide Wildfire Risk Assessment, ODF



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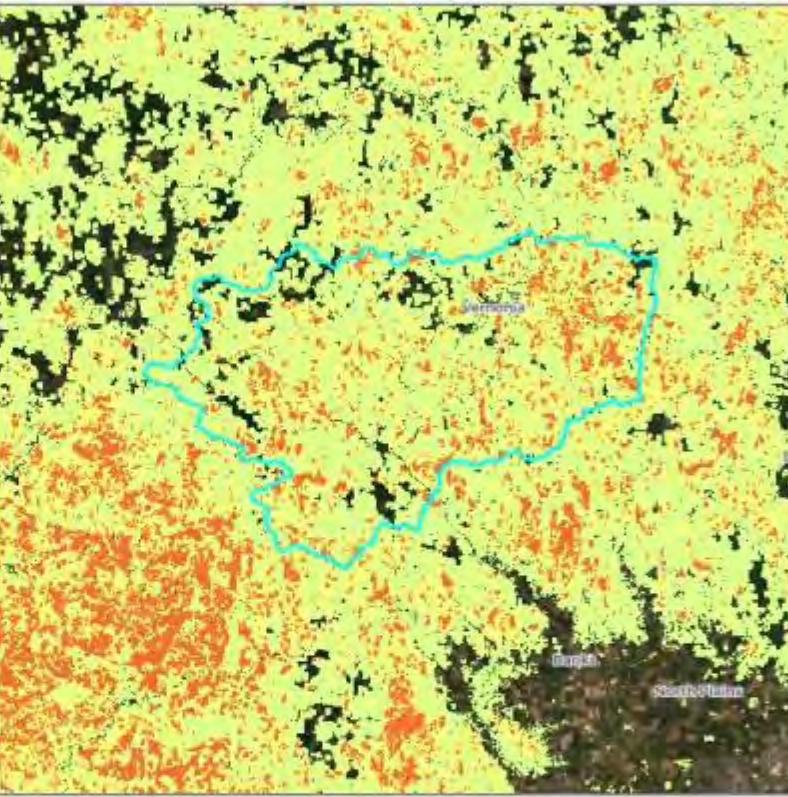
Generated: June 14, 2021

## 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

<span style="color: #c8512e;">■</span> > 11 foot	Fires may exhibit greater than 11-foot average flames with major fire movement, tree crowning, longer-range spotting and ember travel.
<span style="color: #fca82e;">■</span> 8-11 foot	Fires may exhibit 8-11 foot average flames with tree torching and increased ember travel.
<span style="color: #ffeb3b;">■</span> 4-8 foot	Fires may exhibit 4-8 foot average flames, and embers may travel moderate distances.
<span style="color: #90ee90;">■</span> 4 foot	Fires may exhibit 4 foot average flames.
<span style="color: #d9eaf7;">■</span> Non-burnable	This area contains non-burnable fuel types such as water, urban, agriculture, barren rock, etc.



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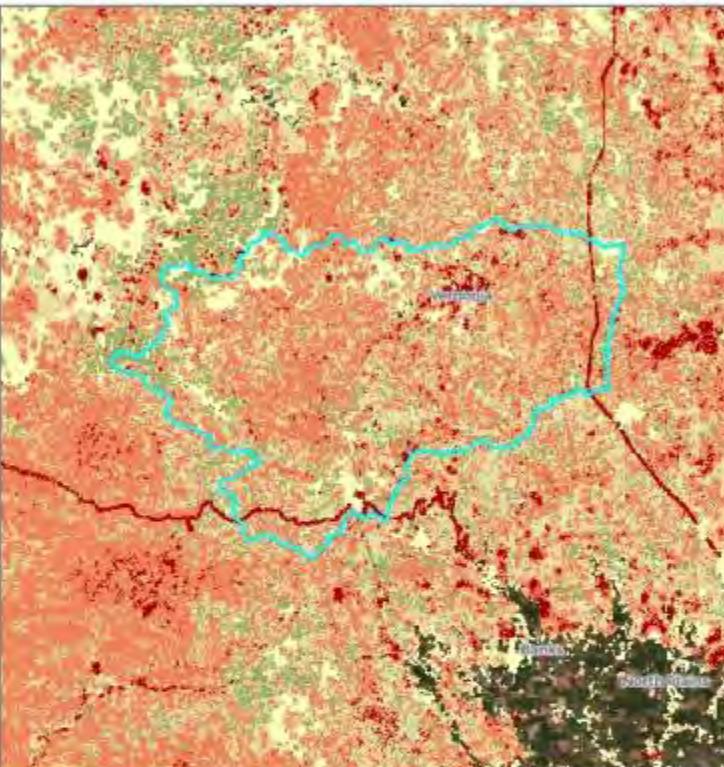
Generated: June 14, 2021

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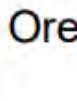
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Generated: June 14, 2021

## Headwaters Nehalem River vegetation type

Category	Description	Acres	%*
<span style="background-color: #f2f2f2;">■</span>	Non-vegetated or recently disturbed	94	< 1
<span style="background-color: #707040;">■</span>	Agricultural	1,304	< 1
<span style="background-color: #008000;">■</span>	Conifer	122,338	86
<span style="background-color: #0000ff;">■</span>	Conifer-Hardwood	1	< 1
<span style="background-color: #333333;">■</span>	Developed	2,838	2
<span style="background-color: #ff8080;">■</span>	Exotic Herbaceous	0	0
<span style="background-color: #ffd700;">■</span>	Grassland	2,055	1
<span style="background-color: #9acd32;">■</span>	Hardwood	7,651	5
<span style="background-color: #00ffff;">■</span>	Riparian	6,413	4
<span style="background-color: #ffff00;">■</span>	Shrubland	12	< 1
<span style="background-color: #9370DB;">■</span>	Sparingly Vegetated	0	0

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

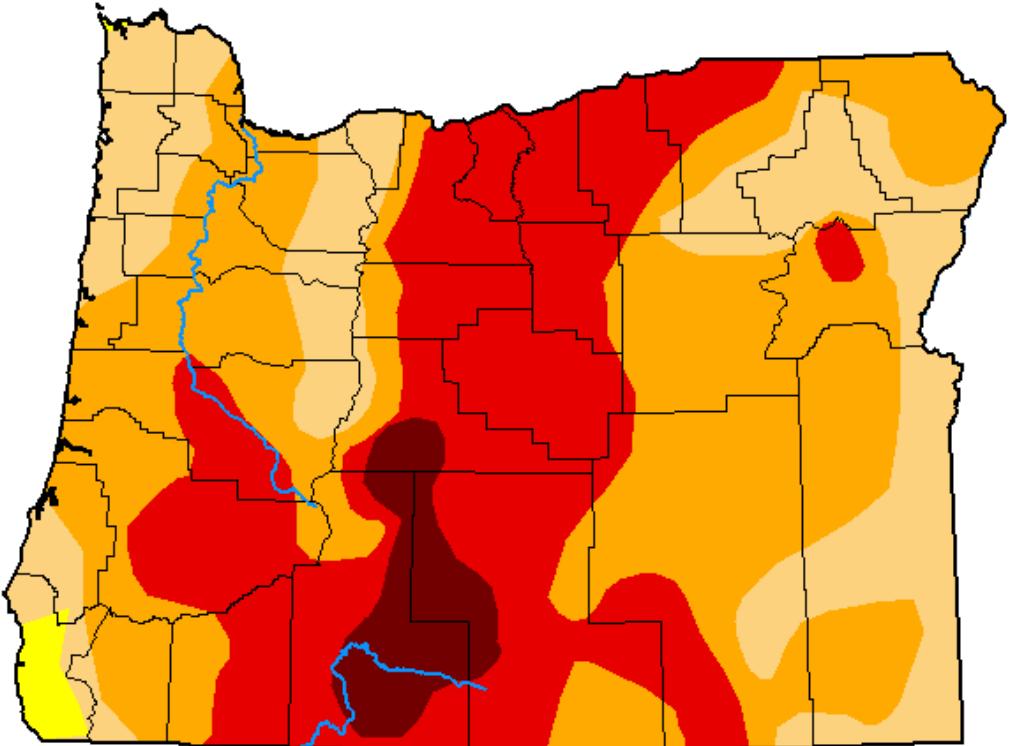
### Resource:

US Forest Service Fire Regime Table  
[https://www.fs.fed.us/database/feis/fire\\_regime\\_table/fire\\_regime\\_table.html#PacificNorthwest](https://www.fs.fed.us/database/feis/fire_regime_table/fire_regime_table.html#PacificNorthwest)

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# U.S. Drought Monitor

## Oregon



June 22, 2021

(Released Thursday, Jun. 24, 2021)

Valid 8 a.m. EDT

### Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	98.99	77.38	36.90	4.78
Last Week 06-15-2021	0.00	100.00	98.99	77.03	36.90	4.78
3 Months Ago 03-23-2021	21.09	78.91	66.00	41.25	12.55	0.00
Start of Calendar Year 12-29-2020	8.57	91.43	83.53	68.71	27.74	0.00
Start of Water Year 09-29-2020	6.50	93.50	84.77	65.53	33.59	0.00
One Year Ago 06-23-2020	5.49	94.51	78.38	45.40	4.78	0.00

### Intensity:

None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions.  
Local conditions may vary. For more information on the  
Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

### Author:

Curtis Riganti

National Drought Mitigation Center

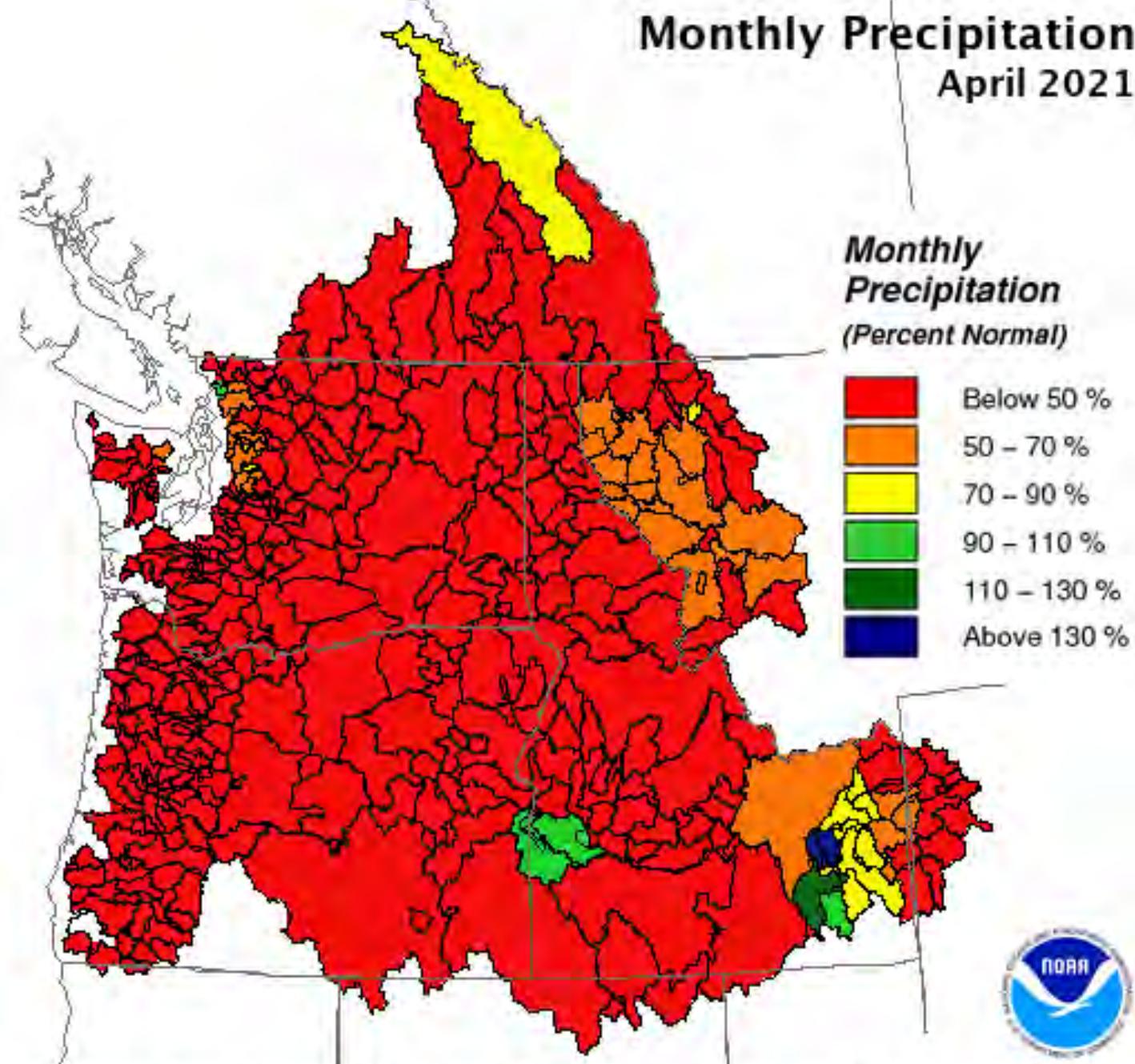


[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

# V. Going into the 2021 Fire Season

# Monthly Precipitation

April 2021



Creation Time: Saturday, May 1, 2021

Northwest River Forecast Center



[NOAA](#)

[Water Supply -  
Water Year  
Summary  
\(noaa.gov\)](#)

**NOTICE:** In January 2020, USGS WaterWatch began operating in maintenance-only mode. Existing tools, features, and web data services are being fully maintained as before, but new tools and enhancements will no longer be developed. Please click [here](#) for more information or contact [USGS WaterWatch](#) if you have any questions.

## WaterWatch

Search WaterWatch ... 

[Home](#)

**Special Features**

[Current Streamflow](#)

[Flood](#)

[Drought](#)

[Past Flow/Runoff](#)

[Animation](#)

[Toolkit](#)

[Annual Summaries](#)

[Data Services](#)

[Additional Information](#)

[About WaterWatch](#)

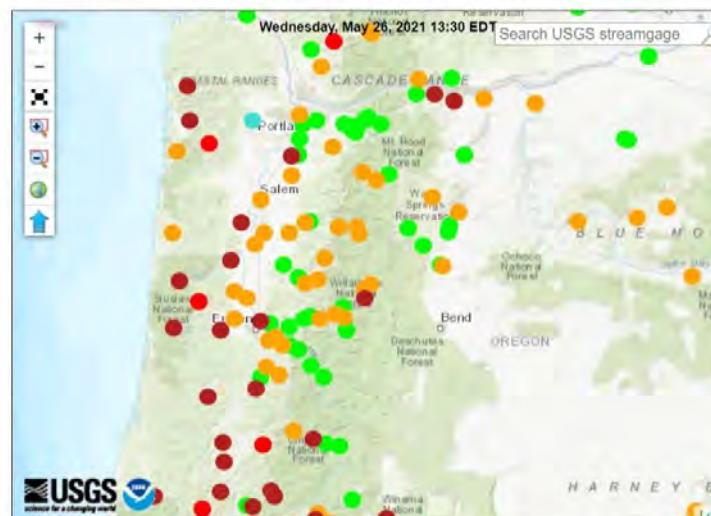
### WaterWatch Streamflow Map

Choose a region and then click "GO" to view a regional map

(Warning: It may take several minutes to process)

Map type	Real-Time	Site info: xus	Clear	<input checked="" type="checkbox"/> Multiple regions	<input type="checkbox"/> Regional map	GO
		Oregon				

#### Map of real-time streamflow compared to historical streamflow for the day of the year



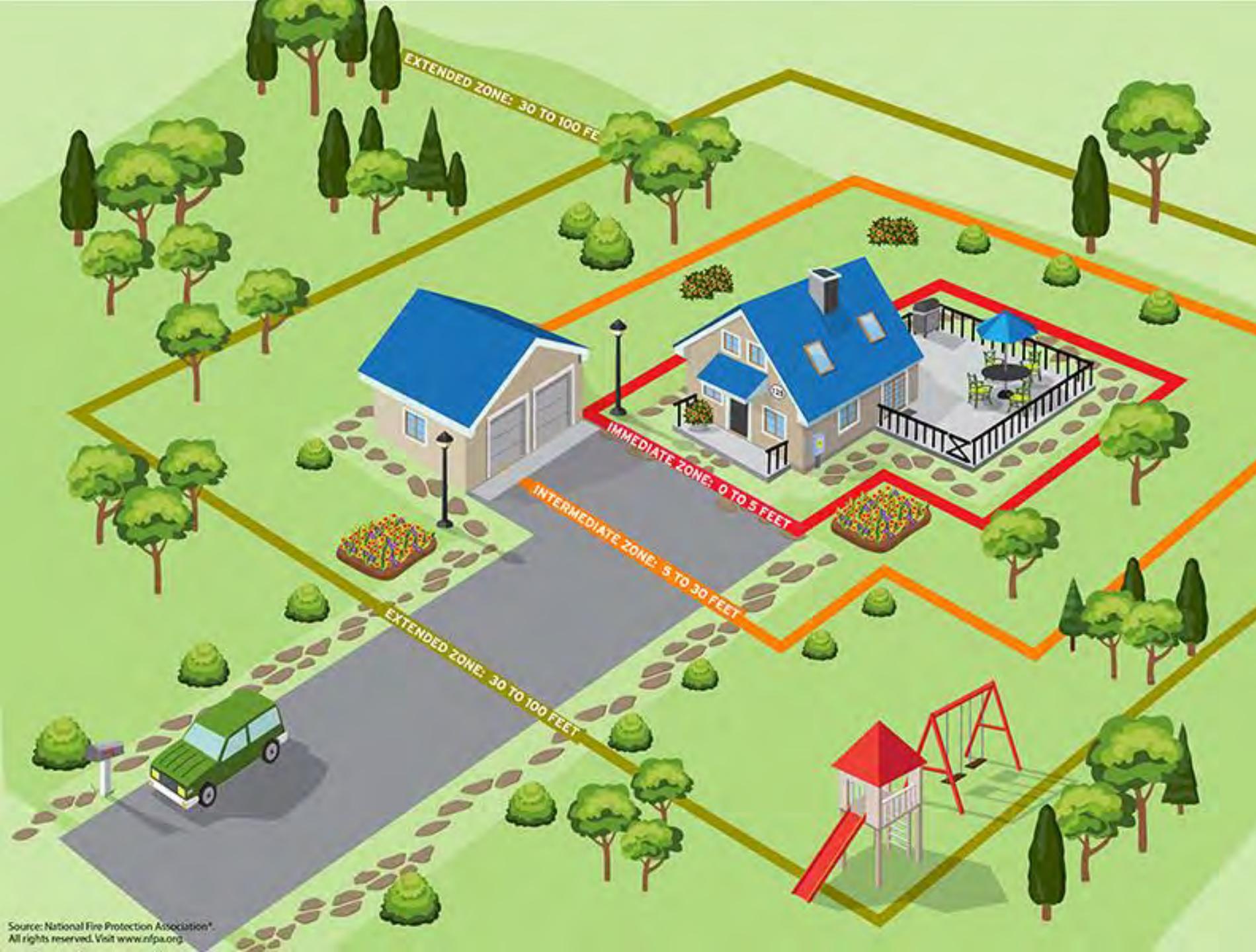
Explanation - Percentile classes						
●	●	●	●	●	●	●
Low	<10	10-24	25-75	76-90	>90	High
Much below normal	Below normal	Normal	Above normal	Much above normal		

## VI. What you can do to protect your home, family, and land

### Home Ignition Zone

The concept of the home ignition zone was developed by retired USDA Forest Service fire scientist Jack Cohen in the late 1990s, following some breakthrough experimental research into how homes ignite due to the effects of radiant heat. The HIZ is divided into three zones.

Source: [NFPA - Preparing homes for wildfire](#)



# Immediate Zone (0-5')

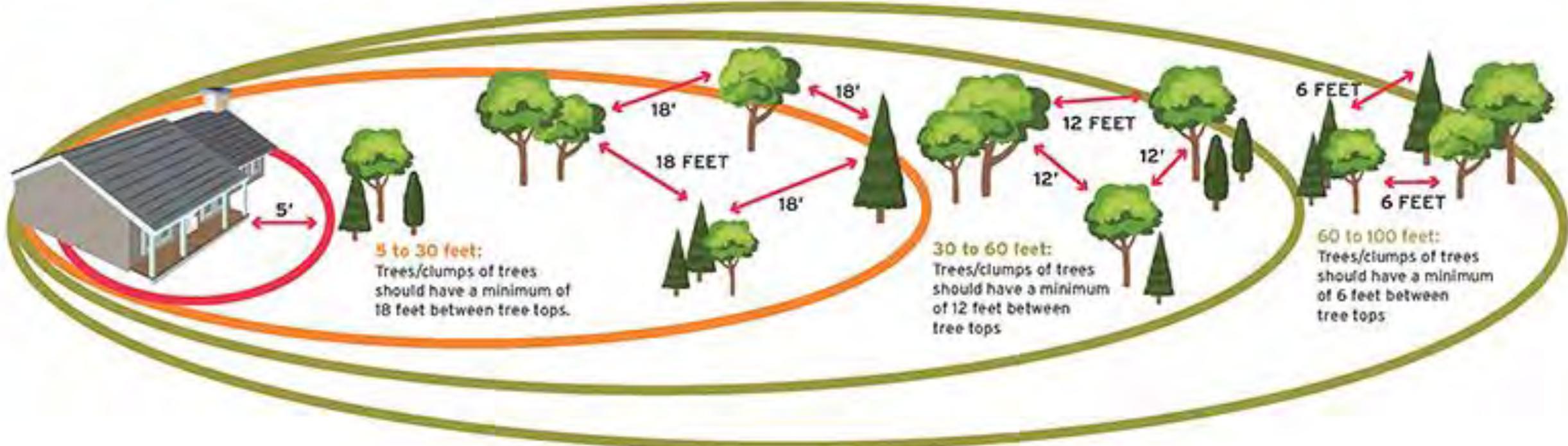
- Clean roofs and gutters of dead leaves, debris and pine needles that could catch embers.
- Replace or repair any loose or missing shingles or roof tiles to prevent ember penetration.
- Reduce embers that could pass through vents in the eaves by installing 1/8 inch metal mesh screening.
- Clean debris from exterior attic vents and install 1/8 inch metal mesh screening to reduce embers.
- Repair or replace damaged or loose window screens and any broken windows Screen or box-in areas below patios and decks with wire mesh to prevent debris and combustible materials from accumulating.
- Move any flammable material away from wall exteriors – mulch, flammable plants, leaves and needles, firewood piles – anything that can burn. Remove anything stored underneath decks or porches.

# Intermediate Zone (5-30' from home)

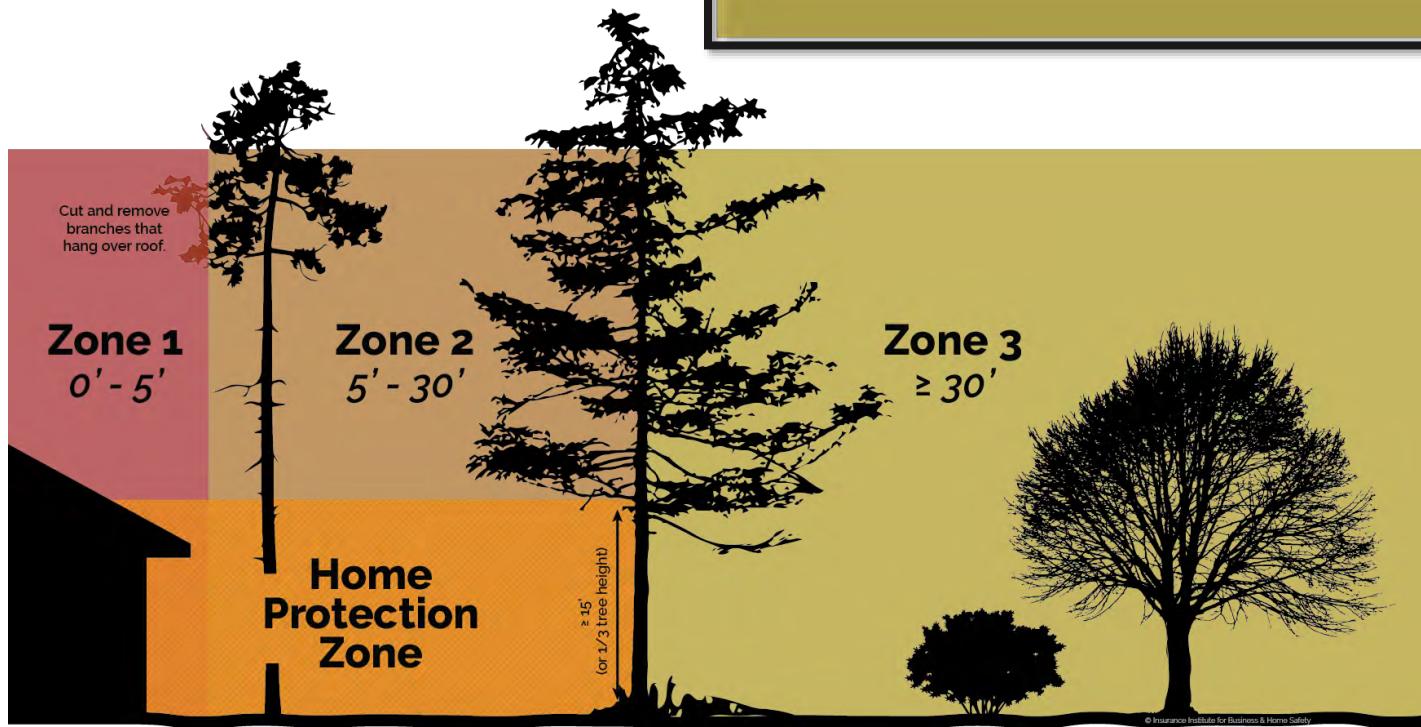
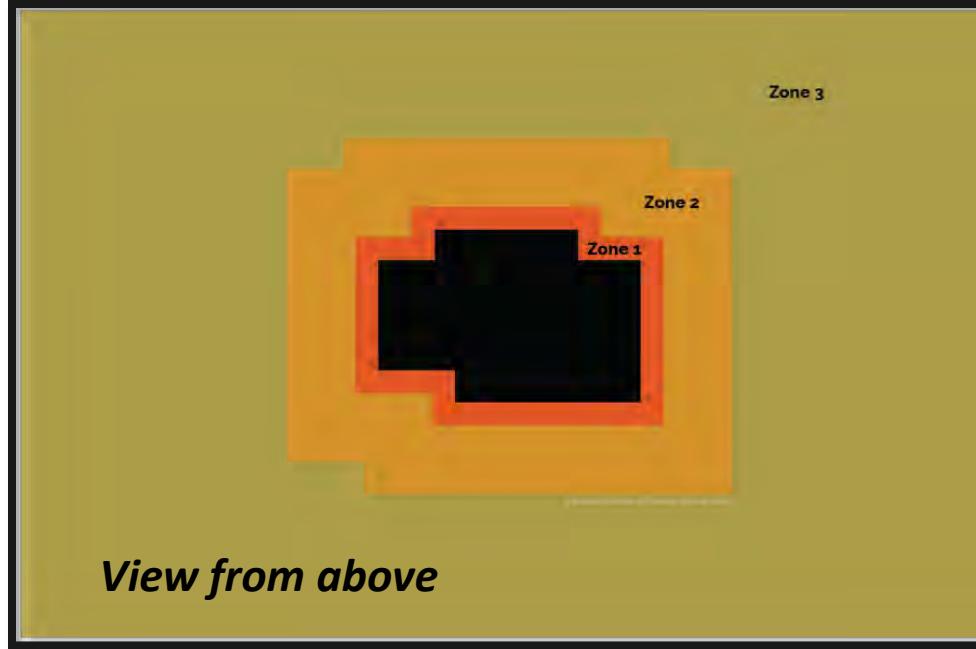
Landscaping/hardscaping- employing careful landscaping or creating breaks that can help influence and decrease fire behavior

- Clear vegetation from under large stationary propane tanks.
- Create fuel breaks with driveways, walkways/paths, patios, and decks.
- Keep lawns and native grasses mowed to a height of four inches.
- Remove ladder fuels (vegetation under trees) so a surface fire cannot reach the crowns. Prune trees up to six to ten feet from the ground; for shorter trees do not exceed 1/3 of the overall tree height.
- Space trees to have a minimum of eighteen feet between crowns with the distance increasing with the percentage of slope.
- Tree placement should be planned to ensure the mature canopy is no closer than ten feet to the edge of the structure.
- Tree and shrubs in this zone should be limited to small clusters of a few each to break up the continuity of the vegetation across the landscape.

## TREE SPACING



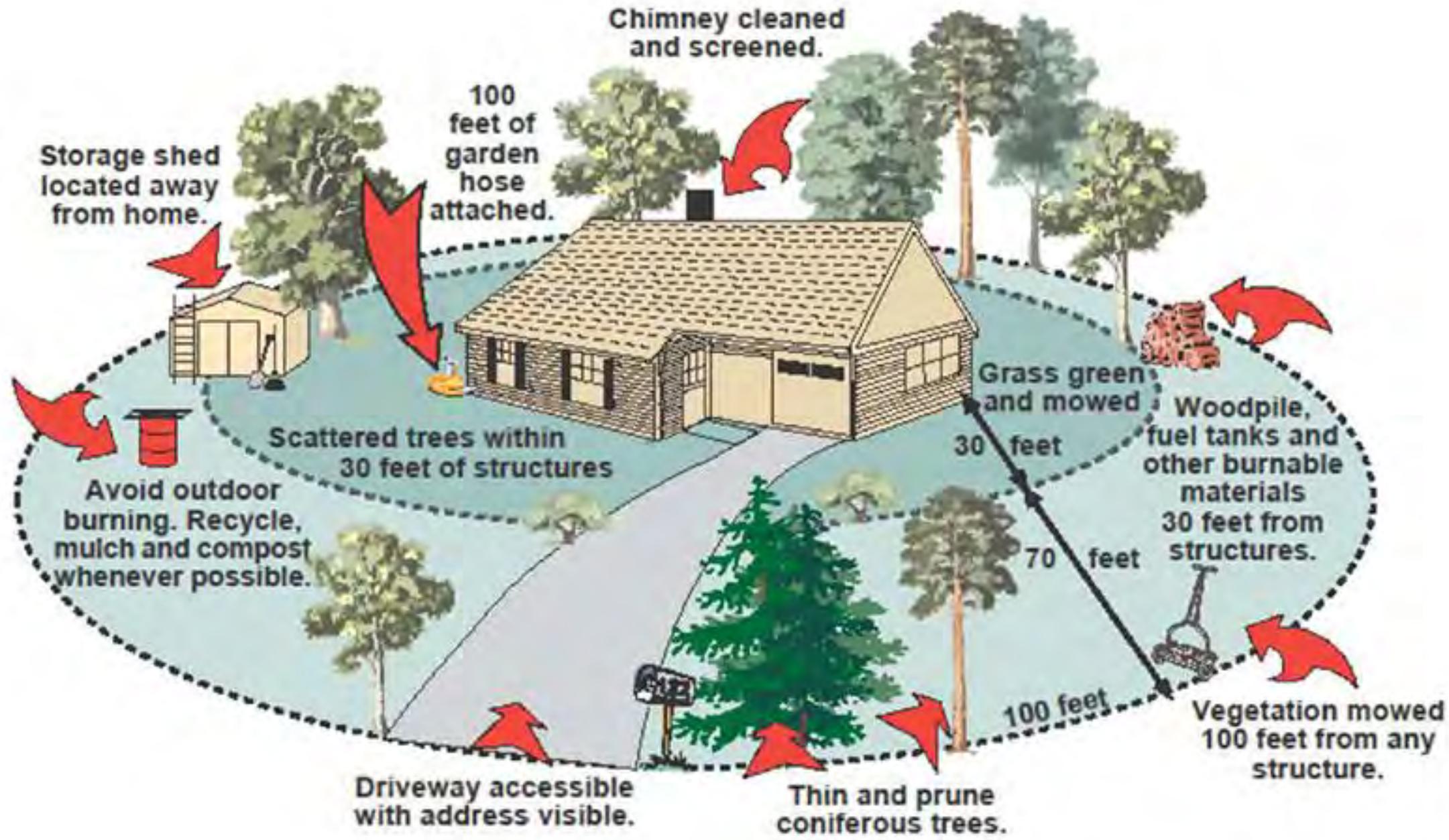
# Home Protection Zone



# Extended Zone (30-100', out to 200')

Landscaping – the goal here is not to eliminate fire but to interrupt fire's path and keep flames smaller and on the ground.

- Dispose of heavy accumulations of ground litter/debris.
- Remove dead plant and tree material.
- Remove small conifers growing between mature trees.
- Remove vegetation adjacent to storage sheds or other outbuildings within this area.
- Trees 30 to 60 feet from the home should have at least 12 feet between canopy tops.\*
- Trees 60 to 100 feet from the home should have at least 6 feet between the canopy tops.\*



# Form a Firewise Community!

- Form a board/committee of residents and other applicable wildfire stakeholders.
- local fire department, state forestry agency, elected officials, emergency manager, etc.
- This group will collaborate on identifying the site's boundary and size. **Firewise sites need to have a minimum of 8 individual single family dwelling units and are limited to a maximum of 2,500.**
- Multiple sites can be located within a single large master-planned community/HOA.
- Obtain a **written wildfire risk assessment** from your state forestry agency or fire department.
- The assessment should be a community-wide view that identifies areas of successful wildfire risk reduction and areas where improvements could be made.
- Emphasis should be on the general conditions of homes and related home ignition zone
- The assessment is a living document and **needs to be updated at a minimum of every 5 years.**

Source: [Firewise USA® - How to become a Firewise USA® site \(nfp.org\)](http://Firewise USA® - How to become a Firewise USA® site (nfp.org))

# Firewise USA sites

How to become a Firewise USA® site	<span>+/-</span>
Firewise USA® resources	<span>-</span>
Annual renewal information	
<b>Firewise USA® sites</b>	<span>+/-</span>
Research Fact Sheet Series	
Download the Firewise USA® logo	
Firewise USA® success	
Learning opportunities	<span>+/-</span>
Order materials	
Contact us	
Preparing homes for wildfire	

Residents Reducing Wildfire Risks

Find address or place

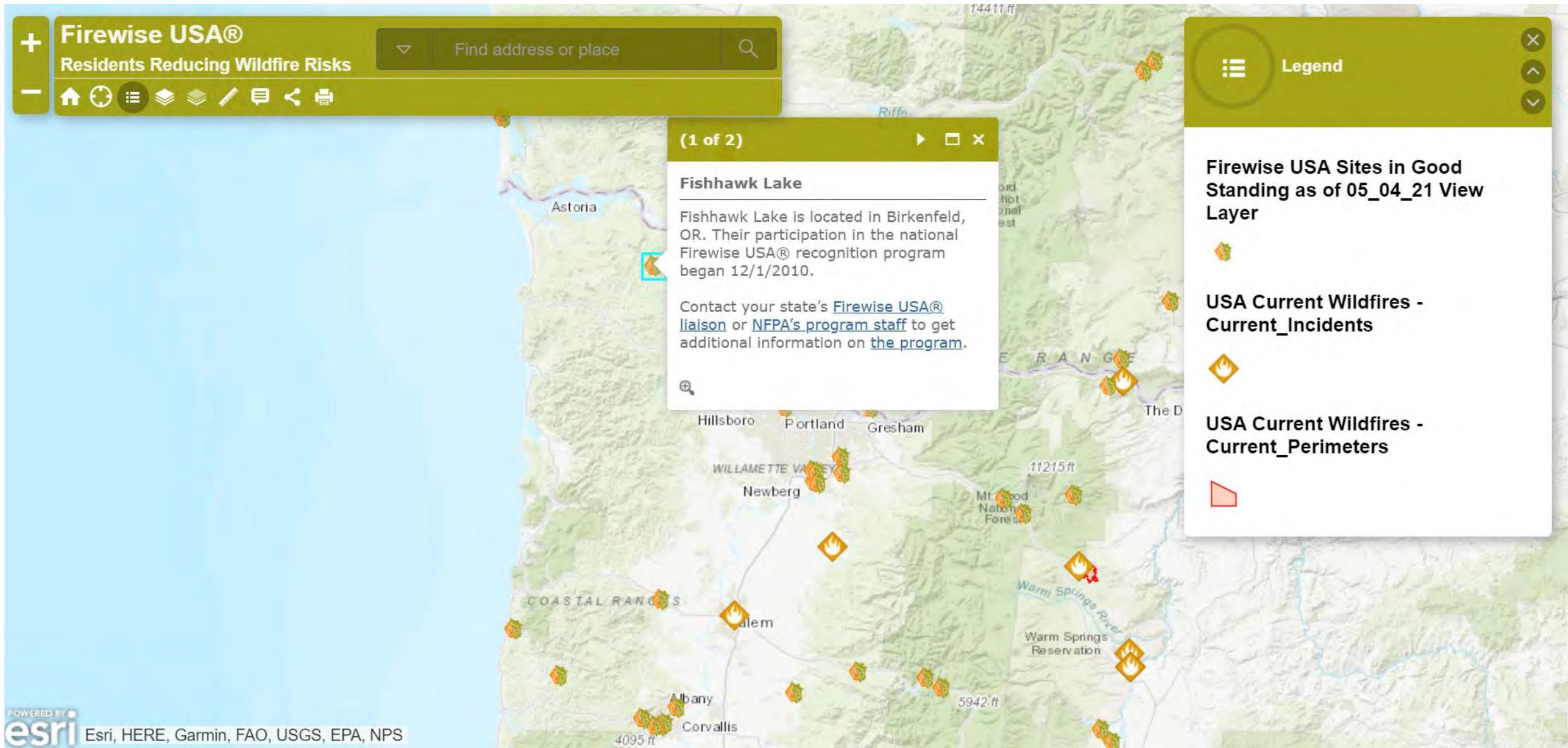
Firewise USA® Established 2001. More than 1.5 million residents reached. Over 140 million dollars invested. Co-sponsored by the USDA Forest Service, the US Department of the Interior, and the National Association of State Foresters.

The map displays the state of Oregon with numerous orange icons scattered across its terrain, representing Firewise USA sites. The icons are concentrated in the central and southern parts of the state, particularly along the Willamette River valley and in the Cascade Range. Labeled locations include Yakima, Kennewick, Yakima Nation Reservation, Gifford Pinchot National Forest, COASTAL RANGES, CASCADE RANGE, Portland, Salem, Eugene, John Day, Malheur National Forest, Warm Springs Reservation, Ochoco National Forest, Deschutes National Forest, Umpqua National Forest, Winema National Forest, Fremont National Forest, and the HARNEY BASIN. Rivers like the Columbia, Snake, and Willamette are also visible.

POWERED BY  
**esri**

Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS

# Fishhawk Lake, Birkenfeld, OR: only Firewise site in Columbia Co.



# EQIP Grants (NRCS)

- Treatments (e.g., prescribed burning and thinning) to build fire resistance and resilience, post-burn recovery).
- See the experience of Rob Guttridge (Clackamas County): [Wildfire Wednesdays: Building Community for Wildfire Resilience - YouTube](#)



# Sign up for Emergency Alerts

- Consider signing up for alerts from not only Columbia County Emergency Management, but also neighboring counties (e.g., Tillamook, Clatsop, Washington,etc.) (situational awareness).
- [Columbia County, Oregon Official Website - Sign up for alerts \(columbiacountyor.gov\)](http://columbiacountyor.gov)
- [Tillamook County Alerts - Sign In \(everbridge.net\)](http://everbridge.net)
- [ClatsopALERTS! | Clatsop County Oregon](http://ClatsopALERTS.com)
- [WCCCCA Washington County Public Alerts](http://WCCCCA.org)

# Key Points

- Under the right conditions, fire is a risk within the Nehalem watershed (high temperatures, low humidity, dry fuels, and east winds of Aug.-Sept. (also NW winds))
- More research is needed to elucidate a robust fire history for the Coastal Range.
- In the Coast Range, lightning can cause fires, but it is rare. The vast majority of fires in the region are human-caused (e.g., arson, cigarettes, equipment, escaped debris/slash pile burn, etc.)
- You can take steps to prepare for wildfire and foster fire resilient landscapes.



# Calls to Action

- If evacuation order is given, leave quickly, and close all doors and windows (most homes burn from the inside out).
- Remove fuels from roofs, gutters, and areas of accumulation (under stairs, deck, etc.).
- Prepare a 72-hour to-go bag with essentials for evacuation (see Fire Aware.Fire Prepared: BE Ready, BE Set, GO!)
- Adhere to local regulations: acquire burn permits from fire department and comply with burn bans.
- Be vigilant during National Weather Service Red Flag Warnings, and if you see fire (flames and/or smoke), call 911.
- Contact your local fire department and ODF for a Fire Risk Assessment. OSU Extension can play a role in site visits as well.
- Consider working with neighbors to form a Firewise community!
- Stay safe, keep your neighbors safe, and keep firefighters safe!

A firefighter wearing a red vest with "USFS" and "VOLUNTEER" patches is spraying water from a hose onto a burning grassland. The fire is visible in the foreground and middle ground, with thick smoke billowing into the sky. Another firefighter is partially visible on the right side of the frame.

Thank you!

Questions?

My contact:

[aaron.groth@oregonstate.edu](mailto:aaron.groth@oregonstate.edu)

# Additional Resources

- Malcolm Hiatt, Protection Unit Forester, Columbia Unit
  - 405 E. St., Columbia City, OR 97018-9737
  - Email: [mhiatt@odf.state.or.us](mailto:mhiatt@odf.state.or.us)
  - Phone: (503) 397-2636
  - Cell: (503) 860-7430
- Vernonia Rural Fire Protection District
  - <https://www.vernoniarfpd.us/>
  - 555 E Bridge St, Vernonia, OR 97064
  - (503) 429-8252
- Sonia Reagan
  - Director with the Columbia Soil and Water Conservation District (CSWCD), Zone 1
  - OSU Extension Columbia County, *Small Farms & Community Horticulture – Business Operations*
    - [503-397-3462](tel:503-397-3462)
    - OSU Extension, Columbia County Office, 505 North Columbia River Hwy., St Helens, OR 97051
    - Email: [sonia.reagan@oregonstate.edu](mailto:sonia.reagan@oregonstate.edu)