# OREGON DEPARTMENT OF FORESTRY

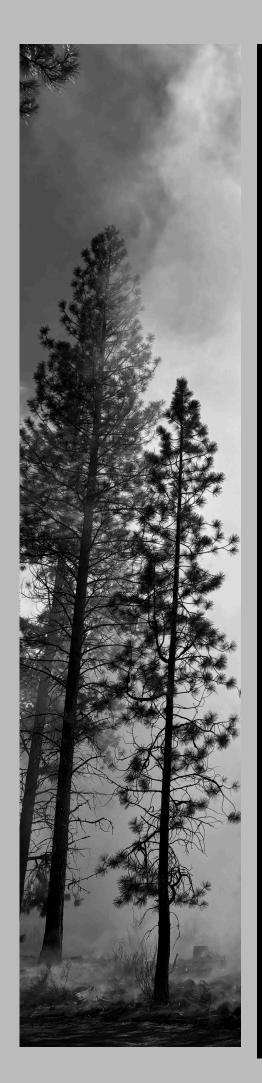
SMOKE MANAGEMENT

**ANNUAL REPORT** 



## **TABLE OF CONTENTS**

OVERVIEWS	
<b>Executive Summary</b>	03
Program Overview	04
PROGRAM UPDATES	
Smoke Monitoring & Audits	04
Directive Performance Measures	06
Meteorology Performance Measures	07
Meteorology	08
Alternatives to Burning	
Community Wildfire Defense Grants	14
Community Wildfire Protection Plans	16
GOALS METRICS	
Performance Measures Goals/Metrics	08
PRESCRIBED FIRE STATISTICS	
Accomplishment Summary	18
Intrusion Summaries	19
<b>Emission Estimates</b>	21
Historical Accomplishments	23
Burn Type Accomplishments	24



#### **EXECUTIVE SUMMARY**

Acres burned – 144,272 Statewide acres were ignited. There has been a continuing concentrated effort by federal land managers to increase pace and scale of prescribed fire to mitigate some of the hazards of wildfire. The 10-year average is 180,475 acres. Both the 10-year average and 2024 acres have decreased.

Intrusions – There were 5 smoke intrusions into Smoke Sensitive Receptor Areas (SSRA's) based on the new 2019 definition (see below) of a smoke intrusion. The 10-year average is 6.5 intrusions.

**Smoke impacts** – There were 17 smoke impacts (smoke incidents) recorded with highest impacts in Sisters at 189 microns per cubic meter. The impacts and PM2.5 levels for 2024 were lower than the previous year.

**Emissions** - Emissions were 9,780 tons of PM 2.5 from piles, underburns, and broadcast burns. This is slightly less than the 10-year average of 10,668 tons.

#### PROGRAM OVERVIEW

The Oregon Smoke Management Plan was developed as a voluntary program in 1969 and adopted as a regulatory program by the State Forester and the Environmental Quality Commission (EQC) in 1972. The plan has gone through several major revisions since then. The last revision to the plan was completed in early 2019. Implementation started March 1 of that year.

Key elements changed in the plan include: \*

- 1. The definition of a smoke intrusion to include a threshold for a short-term (hourly) smoke impact and a threshold for a 24-hour average impact.
- 2. Development of a communication framework and community response plans. Approved community response plans will allow for an exemption to the one-hour threshold of a smoke intrusion.
- 3. Increasing the amount of polyethylene sheeting allowed to cover burn piles to keep them dry to reduce smoke emissions.

\*See OAR 629-048 for the details of these changes.



#### PROGRAM OVERVIEW CONT.

#### The plan's overall purposes are:

- 1. To improve the management of prescribed burning as a forest management and protection practice.
- 2. To minimize emissions from prescribed burning consistent with the air quality objectives of the federal Clean Air Act.

The plan applies to all lands classified as forestland and all federally managed forestland, whether classified or not, within a forest protection district.

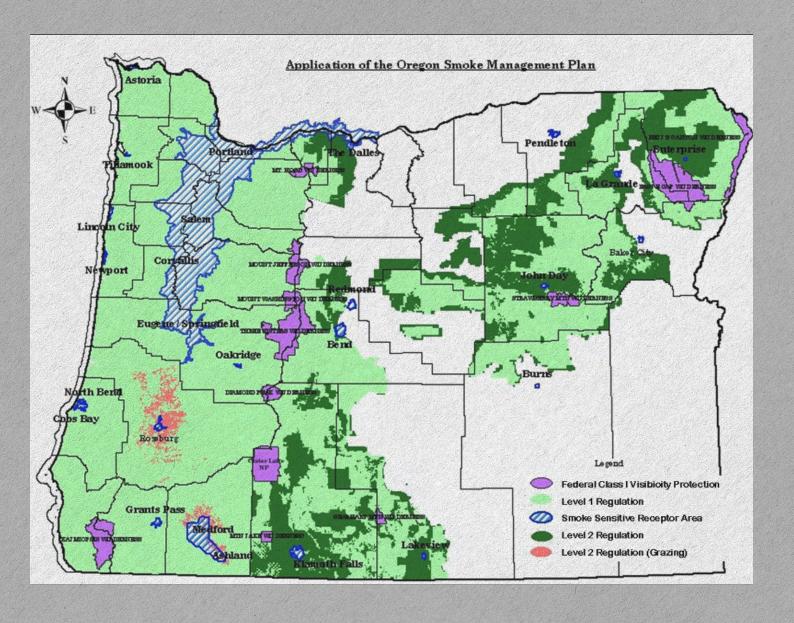
In general, all federal forestland and Class I forestland in western Oregon is regulated at a higher level but all forestland owners and managers must comply with most or all aspects of the program.

## The Oregon Smoke Management Plan contains six principal objectives. These objectives are to:

- 1. Minimize smoke emissions resulting from prescribed burning.
- 2. Provide maximum opportunity for essential forestland burning.
- 3. Protect public health by avoiding intrusions.
- 4. Coordinate with other state smoke management programs.
- 5. Comply with state and federal air quality and visibility requirements; and
- 6. Promote the further development of alternatives to burning and emission reduction techniques.

#### MONITORING AND SMOKE AUDITS

The Oregon Smoke Management Plan's goal is an annual audit of approximately one percent of the prescribed burns conducted in the Regulated Area (see map below). Approximately half of the audits are conducted on the day of the burn and half are conducted prior to ignition. The purpose of these audits is to maintain consistent data reporting and monitor the effectiveness of the Oregon Smoke Management program.



## MONITORING & AUDITS CONTINUED

The Smoke Management Field Coordinator devotes significant time to overseeing the audit program and improving the compliance for conducting audits. This year 38 audits were completed, for a total of 17,296 audited tons. The audit breakout was 21 pre-burn audits and 17 burn-day audits. Forest Service, BLM, state, and private units were audited. At least one of these audits was mutually agreed upon and performed on a non-regulated neighboring agency in a successful relationship building and information-sharing visit.

Trends this year showed a significant improvement in reported tons within acceptable ranges due to continued coordination on the West Bend Pilot Burn project. 36 units were withing goal range and only 2 units were under reported in tons. This may be a second abnormal year due to the concentrated efforts on West Bend.

The Smoke Management Field Coordinator continues to teach both agency and non-agency personnel the proper way to estimate fuel loading through on-the-job training during site visits, burn boss refresher training courses, the regional Rx-301/341, and Rx-410 Smoke Management Techniques course, and fuel-load estimation briefing papers.

## ed Fuels Biomass a Calculato

AL (USE [Start over/change m

oup No./Name to edit given group)

	Pile Dimensions (ft)	Soil %	Packing Ratio	Pile Composition
ipsoid	W1: 5 H1: 3 L1: 6	N/A	N/A	Conifer
ipsoid	W1: 5 H1: 3 L1: 6	N/A	N/A	Conifer
ipsoid	W1: 5 H1: 3 L1: 6	N/A	N/A	Conifer

Add more piles Start over (clear all piles)

		[Print-friendly				
oss ume	Adjusted* Volume	Pile Biomass	Consumed Fuel	Emissic		
ic ft)	(cubic ft)			PM	PM <sub>10</sub>	
47.12	54.42	0.1307	0.1241	0.0014	0.0010	
47.12	54.42	0.1307	0.1241	0.0014	0.0010	
21.68	3,374.23	8.1018	7.6967	0.0843	0.0596	
15.93	3,483.07	8.3632	7.9450	0.0870	0.0616	

s is corrected to account for the difference

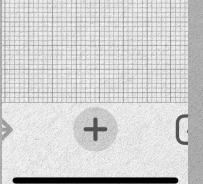
of solid wood is determined by subtracting t appropriate packing ratio.

Fire and Environmental Research Applic. Pacific Wildland Fire Sciences Laborator, USDA Forest Service Pacific Northwest F 400 N 34th Street, Suite 201, Seattle, V 732-7800

Contact: P.C. Eagle

We acknowledge funding from t

under Projects JFSP 07-2-1-57



## MONITORING & SMOKE AUDITS CONTINUED

An entire series of video tutorials on how to do a fuels transect, estimate tonnage, and use tools to help burners have also been advertised and published to the field. In addition, the SIMPLE fuel-loading calculator (a web-based program that utilizes a modified Browns transect for estimating fuel-loading) has been accepted by Forest Service and BLM researchers. Research and testing are ongoing as the field continues to use the new fuel-loading tool. Our federal partners have adopted its use and ODF's SIMPLE fuel-loading estimation methodology as their standard operating procedures. A white paper on the technique and where to get more information was developed by the Smoke Management Field Coordinator in consultation with the Forest Service's Regional Air Quality Program Manager. It's anticipated this outreach and education effort will lead to more precise fuel-load estimates.

#### DIRECTIVE PERFORMANCE MEASURES

The Audit program touches all performance measures. The principal goals of the Smoke Management Plan are identified in OAR 629-048-0010(4).

#### **Meteorology Performance Measures**

ODF Forecasters and staff continue to comply with state and federal air quality and visibility requirements by minimizing smoke emissions, resulting from prescribed burning by asking if and encouraging the use of polyethylene on piles to reduce emissions. This provides maximum opportunity for essential forestland burning by incentivizing the use of ERTs (Emission Reduction Techniques) through offering a 50% increase in tonnage for burn units using ERTs vs. those burns not using ERTs. Continued follow-up with review and analysis of any intrusions also facilitates the protection of public health through intrusion avoidance. Increased cross-agency collaboration and coordination with other state smoke management...



## **Meteorology Performance Measures** continued

programs keeps ODF up-to-date on best practices and improves the increase in smoke management communication at the local level and across stakeholders.

#### **METEOROLOGY**

Oregon Department of Forestry meteorologists provide written daily Smoke Management forecasts and burning instructions statewide from October – June, as well as year-round phone consultation for prescribed burning operations.

Through a cooperative agreement with DEQ they are compiling the open burning forecast for the Willamette Valley north of Lane County throughout the year. In addition, ODF provides the Department of Agriculture field burning forecasts for the north Willamette Valley, Jefferson County, and Union County during the summer field burning season (July 5- October 15).

Other weather forecast services include 3-month outlooks (issued monthly) & support for significant weather events that may or may not increase the chances for wildfire starts/spread (i.e., heavy rain/snow/ice, wind, lightning, etc.).

## ALTERNATIVES TO BURNING, EMISSION REDUCTION TECHNIQUES

As part of a recommendation from the 2013 review of the Smoke Management Plan, the program is tracking acres of treated forestland where alternatives to burning were employed instead of using prescribed fire. In addition, emission reduction techniques of prescribed burn units are also tracked. See results:



Total statewide acres using emission reduction techniques including landing, grapple, hand-piled, and right-of-way piles according to ODF Smoke Management Database: 144,272. This is a significant increase to 2023 acreage.

Alternative to burning techniques include biomass removal, scattering material, chipping, crushing, firewood removal, non-treatment, or other techniques for reducing fire hazards and/or creating planting spots without using prescribed fire.

Emission reduction techniques including piling clean piles instead of broadcast or underburning, use of rapid ignition techniques, covering piles with polyethylene sheeting to keep the piles dry, and other techniques used to reduce particulate and gaseous emissions while burning.

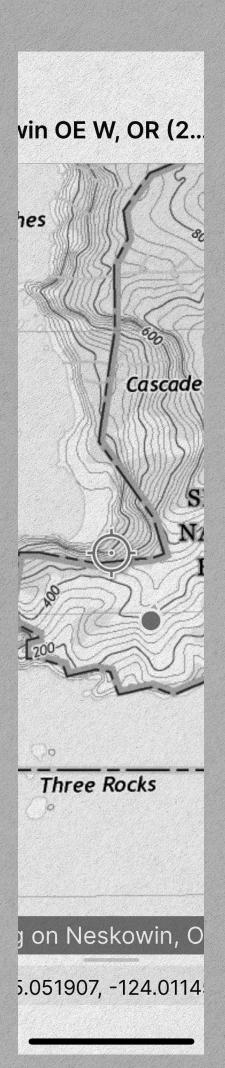
The goal is to show the program is not exclusively focused on prescribed burning but all treatment methods that most effectively reduce fire hazard, maintain productive and resilient forests, and keep or improve air quality.

## PERFORMANCE MEASURES GOALS/METRICS

Goal: 1 Minimize smoke emissions, resulting from prescribed burning.

ODF captures when alternatives to burning or emission reduction techniques have occurred. This has led to an increase in tonnage burned because piles that are covered create cleaner consumption of volatile organic compounds (VOC's). Total statewide acres using emission reduction techniques including landing, grapple, hand-piled, and right-of-way piles in 2024 were: 125,365.

Training in emission reduction techniques (ERT's) are taught on site at every Rx burn that the Smoke Management Field Coordinator or Prescribed Fire Specialist attend. There were over 34 smoke audits where training occurred, and approximately 5 other trainings via federal prescribed fire and smoke



management trainings or various presentations to EPA conferences and Prescribed Fire Counsels where there were hundreds of attendees trained.

## Goal: 2 Provide maximum opportunity for essential forestland burning.

The number of ignitions completed in 2024 is 3,230. This amounted to a total of 144,272 acres.

The Smoke Management Field Coordinator is promoting the use of polyethylene for increased tonnage allowance and forecasters are allowing a 50% increase in tonnage for burn units using ERTs vs. burn units not using ERTs.

There were 3 communities with active 1 hour exemptions through their Community Response Plans: Ashland, Bend, and Enterprise.

## Goal: 3 Protect public health by avoiding intrusions and building smoke resilient communities.

Ongoing work to promote collaboration between local and tribal public health authorities, vulnerable populations, vegetation/fuel managers, and prescribed burners continues, by being available to assist in the development of at least one new CRP annually. There are currently 8 CRPs in Oregon. DEQ is not aware of any new CRPs being developed since those developed using grant funding provided by SB 762, which resulted in the completion of 4 CRPs in 2022/2023. Locations for 20 additional SensORs have been identified but these monitors have not been deployed due to staffing constraints associated with deployment, maintenance, and data management requirements for the monitors. The goal is to have these in place by 2026.

# Goal: 4 Strengthen cross agency collaboration and coordination with other state smoke management programs.

ODF staff have attended several cultural burns to strengthen tribal smoke programs. Our staff has also presented and attended at the national EPA smoke



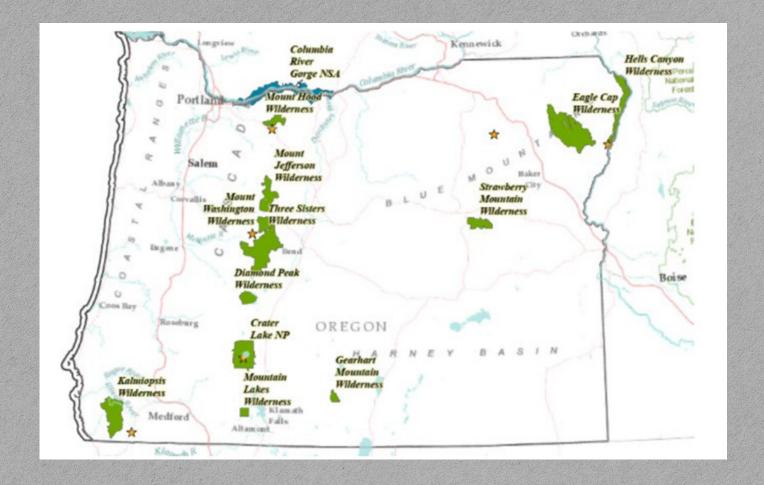
seminar meeting. We continue to meet with EPA, DEQ, USFS, OHA, and others to promote and collaborate between local and public health authorities, vulnerable populations, vegetation/fuel managers, and prescribed burners across the state. DEQ presented at EPA's Smoke Management in the Northwest Conference. Presentations were also provided for Smoke Ready Communities, the Oregon Prescribed Fire Council, and the Western States Air Resources Council. Technical assistance was provided to communities regarding prescribed fire smoke response and communications.

In addition to participating in SMAC meetings, in 2024 OHA engaged vigorously in the multiple collaboration venues under the joint agreement among EPA and USFS regional leadership, and the state health, environmental, and forestry agency directors of Oregon and Washington to increase the pace and scale of prescribed fire, and to implement a pilot project under the agreement in the West Bend area of the Deschutes National Forest.

## Goal: 5 Comply with state and federal air quality and visibility requirements.

Forecasters and the Smoke Management Coordinator monitor air sensors daily to ensure requirements are met. Smoke incidents are logged and all intrusions are documented with a detailed report. Five intrusions were the result of the West Bend Pilot. The other occurred in Coos Bay.

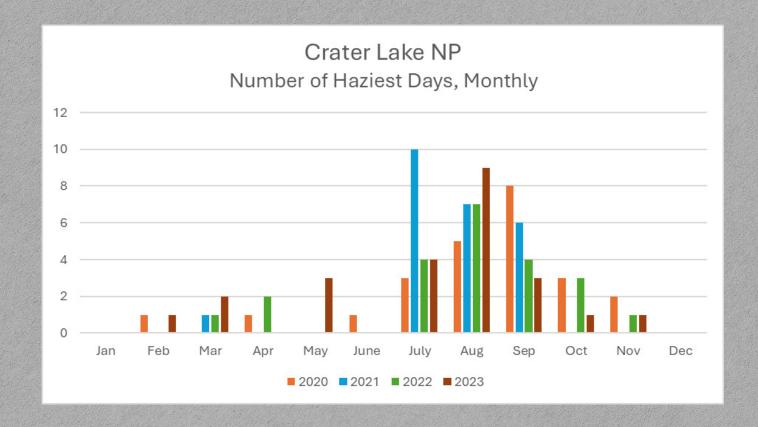
Class 1 areas info; Oregon's Smoke Management and Regional Haze programs work in concert to reduce visibility impacts to Class I Visibility Areas. Oregon's 12 Class I areas are shown in green in Figure below. While the Regional Haze program focuses on pollutants from both permitted and non permitted sources, Smoke Management aids in reducing haze through the use of emission reduction techniques, including meteorological forecasts and tonnage limits, use of covers to keep piles dry, and alternatives to burning when possible such as chipping, masticating, or using an air curtain incinerator.

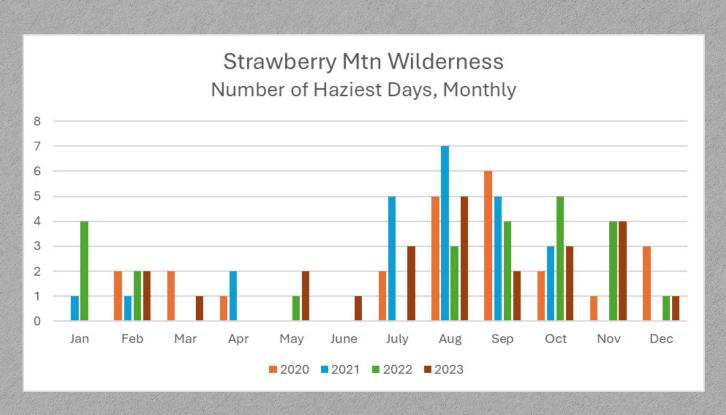


Map of Oregon's 12 Class I Areas (green) and the Columbia River Gorge National Scenic Area.

The following charts show the number of haziest days by month from 2020 – 2023 for two Class I areas; Crater Lake National Park and the Strawberry Mountain Wilderness. Regional Haze data is available on the WRAP Technical Support System website and compiled from the Inter-agency Monitoring of Protected Visual Environments (IMPROVE) program. The IMPROVE program monitors pollutants and generates metrics to identify sources and causes of regional haze at all Class 1 Areas in the U.S. The haziest days for both locations occurred from July through October, when wildfire smoke is typically impacting many areas in the state. The spring prescribed fire season, from about March through June, experienced from 0 to 3 days per month each year. The fall and winter seasons, when pile burning is more common due to meteorological conditions, saw a maximum of 4 days per month.

## **Hazy Days in Key Scenic Areas**







# Goal: 6 Continuously increasing social license and the development of positive public perception of prescribed fire.

ODF continues to maintain smoke communications efforts. by updating and distributing the Statewide Communication Framework (SCF) to stakeholders annually. We continue to promote collaboration by assisting in regional engagement related to Smoke Management and Prescribed Fire burning in Oregon. The 2024 communication strategy document was sent out November 15th 2024. The Smoke Management Field Coordinator and the Prescribed Fire Specialist work diligently with burners on the ground to educate the public on the benefits of prescribed fire and how to protect yourself from smoke should it occur in your area. Continued efforts are given to public meetings with Dept. of Transportation to ensure road safety and visibility. The Smoke Management Field Coordinator also serves nationally as an Air Resource Advisor to assist communities in finding information on what wildfire and prescribed fire smoke will be doing each day ignitions are occurring.

DEQ staff coordinated with agency partners to conduct the West Bend Pilot. Coordination included a range of work, including but not limited to, formulation of agreement language, determining how to address air quality concerns during the pilot, and providing smoke modeling and forecasting support.

OHA funded the Regional Climate and Health Coordinator for Deschutes, Crook and Jefferson Counties to prepare at-risk communities for possible smoke impacts from the West Bend Prescribed Burn Pilot, served on the West Bend Incident Management Planning Team for the Pilot (including staffing State Liaison, Health, Research, and Communications Groups), supported development of the post-pilot Bend Community Survey, and provided review and comment of the University of Oregon West Bend Pilot After Action Report. OHA also presented during the annual pre-season Inter-agency Smoke Management call and the Summer Hazards Kickoff meeting for county



and tribal public health partners. Finally, OHA anticipates the 2025 legislature will renew funding OHA passes through to public health system partners (Oregon's Nine Federally Recognized Tribes, local county public health authorities, and 57 community based organizations) to build climate resilience to wildfire and smoke, through development of climate and health plans and strategies that include a focus on smoke impacts.

## **2024 Community Wildfire Defense Grant**

2024 brought 13 additional Community Wildfire Defense Grant (CWDG) awards to Oregon totaling over \$24M in funding for communities across the state to help fund CWPP updates, mitigation education projects and fuel mitigation projects. In addition to the three communities that were funded to update their CWPP, other communities have been able to start projects that include creating defensible space around homes and other structures, implementing fuel breaks, creating Firewise Communities, educational projects and more. ODF The Dalles Unit partnered with Wasco County and was awarded \$1.9M for planning and implementing fuel reduction projects including removing hazard trees around homes. The ODF La Grande Unit partnered with Wallowa Resources on an awarded proposal and will be receiving \$114k to perform defensible space treatments, home ignition zone assessments, and community coordination.



## 2024 Community Wildfire Defense Grant continued

Growing interest in the program brings increased competition for the 3rd round of the CWDG with planning for Round 4 already underway. Requests for funding across Oregon in the 3rd round totaled \$177M for this nationally competitive grant. Award announcements for Round 3 are tentatively scheduled to take place summer of 2025, we are hoping for great success for Oregon!

The CWDG Coordinator continues to provide support and technical assistance year- round for ODF and other entities across the state that are interested in this funding source.

#### **Community Wildfire Protection Plans**

The Community Wildfire Protection Planning (CWPP) process is the collaboration between communities and agencies interested in reducing wildfire risk. Oregon Department of Forestry field staff participates in the development of CWPP's at the local level, working with state and local agencies, community members, and federal partners to prioritize hazardous fuel reduction projects on federal and private lands in the wildland urban interface. Numerous counties and communities are working to update CWPP's across the state. In 2024, Upper Deschutes River (Deschutes County), Lake, Sherman, Linn, and Lincoln counties completed updates.



#### **National Fire Plan**

Oregon was awarded \$1,986,577 for mitigation of hazardous fuels in high-risk communities through the 2024 Western State Fire Managers' (WSFM) Wildland Urban Interface (WUI) grant program. This funding is made possible by the USDA Forest Service National Fire Plan State Fire Assistance in partnership with the Council of Western State Foresters. These funds will reduce wildfire risks for property owners across Oregon in communities such as Tillamook, along the coast, and Rocky Point in south central Oregon.

Additionally, two projects were selected through the Community Assistance grant program funded by US Forest Service Region 6. These projects were chosen based on reduced wildfire hazard in Communities at Risk in Oregon and benefit to federal lands through mitigation and prevention activities. More than a million dollars was provided to fund these projects and support the Oregon Prescribed Fire Council's mission to promote and conserve the fire adapted natural ecosystems in Oregon and expand the responsible use of prescribed fire.

In 2024, WSFM-WUI and Community Assistance projects from prior year awards treated 1,510 acres within the WUI, implemented prevention activities within communities and promoted the Firewise USA ® recognition program. An additional 127 acres were treated through Joint Chiefs' Landscape Restoration Partnership and Watershed Restoration and Enhancement Act (Wyden Amendment) agreements.



#### Firewise USA®

In 2024 residents across Oregon continued to show interest in improving their community's resilience to wildfire and understanding the work they can do to protect their home during a wildfire. Thirty-two new Firewise USA ® sites were recognized in Oregon in 2024, including the first site in Lake County, which spans the Oregon and California border. Oregon ended the year with 298 sites in "good standing", ranking second for all states across the nation. Nationally, Deschutes County ranked 4th and Jackson County was 5th for the number of sites in a county. Oregon Department of Forestry works with homeowners, partner agencies and local fire districts to develop community risk assessments and three-year action plans for the sites. Residents in Firewise USA ® sites invested 242,871 hours of time reducing wildfire risk to their home and property through home hardening actions, clearing flammable materials from around the home, reducing vegetation within the home ignition zone (0-200'), and learning wildfire prevention and mitigation strategies. In addition to the residents' investment of time, \$3,658,533 was paid to contractors for activities related to wildfire risk reduction.

National Fire Protection Association's Firewise USA ® is a voluntary recognition program administered in Oregon by Oregon Department of Forestry. The program is co-sponsored by the USDA Forest Service and National Association of State Foresters. Firewise USA ® provides an organizational framework to support neighbors working together to reduce wildfire risks within their neighborhood and community.

## TABLE 1 2015-2024 ACCOMPLISHMENT SUMMARY

The following tables and figures provide detailed information about the Smoke Management program. The data details accomplishments for 2024 and compares them with previous years.

Year	Total No. Units (Registered)	No. Units Burned	Acres Burned	Tons Burned	Incidents	Intrusions	Intrusion/ignition%
2015	3,601	3,101	179,613	1,371,114		9	.24^
2016	3,484	2,928	181,800	1,228,107		11	.30^
2017	3,597	2,868	159,624	1,004,108		10	.29^
2018	4,307	3,388	185,702	1,270,725		18	.42^
2019*	3,726	3,319	200,629	1,245,128	39	6	.14^
2020	3,146	2,287	130,997	863,875	1	0	.00^
2021	3,253	2,476	143,653	996,496	43	2	.06^
2022	3014	2,148	107,463	874,117	13	1	.01^
2023	2,649	3,477	154,406	1,056,036	19	2	.05^
2024	3,029	1,393	144,272	999,192	17	5	.0515^
Average	3,381	2,739	158,816	1,090,890	22	6.4	0.02^

Comes from Instrusion folder in Smoke drive and smoke database for total units registered, burned, acres, and tons.

Must get ignitions from accomplishment summary in order to divided intrusions/ignitions \* 100.

\*Based on new smoke incident and intrusion definitions implemented in the 2019 rule change.

^Values were all recalculated from 2012 to intrusions per ignition.

Note: Due to updated information from units being registered, accomplished, or database updates after December 31, <u>numbers may vary slightly.</u>

Note: Due to updated coding, numbers may vary slightly.

# Figure 2a Number of Intrusions (Hours) 2024

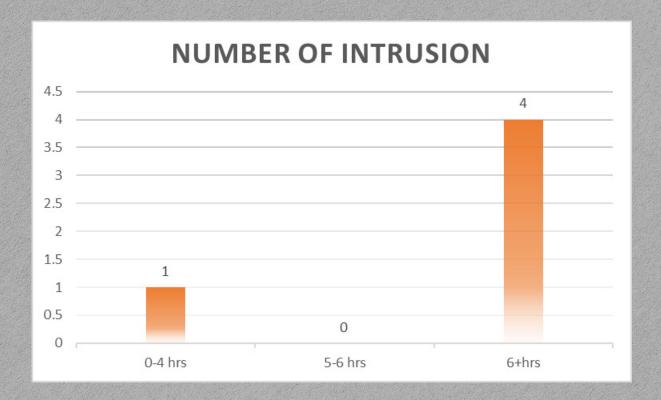
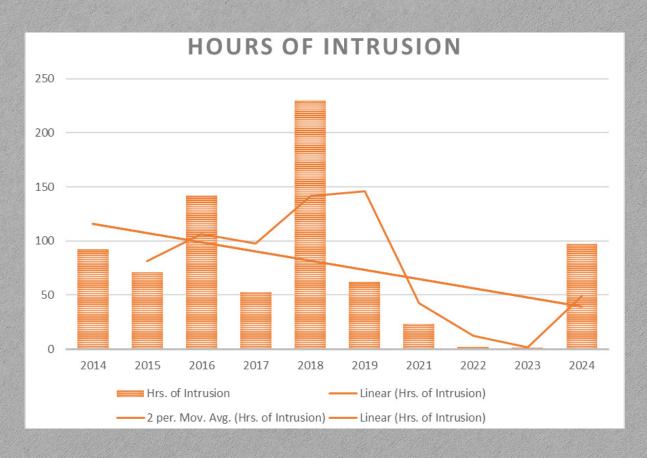


Figure 2b
Accumulated Hours of Intrusions 2024



### **INTRUSION STATISTICS**

# Figure 3 Intrusion Summary, 2024

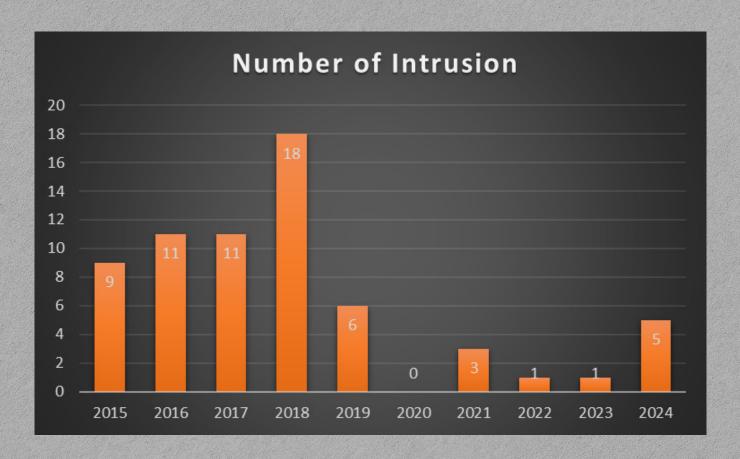
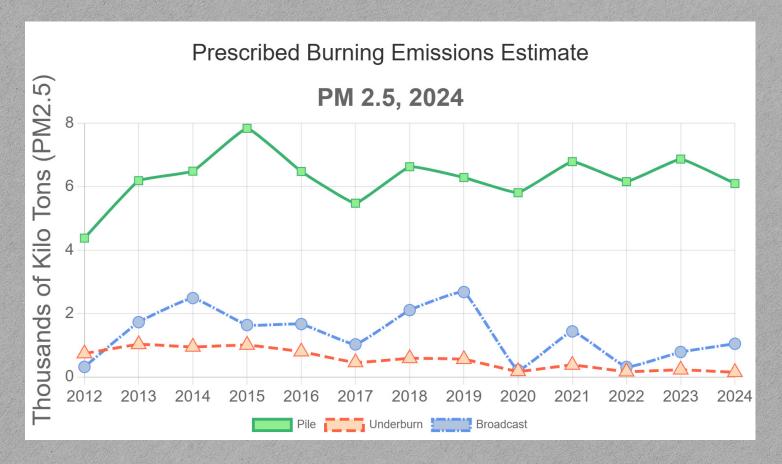


Table 2
Smoke Intrusion Summary 2024
\* 24 HOUR INTRUSION

Date -	District/Forest -	Primary Area Affected	Unit# ▼	Owner Class 🔻	Max hrly., Max 24 hr.	Legnth -
05/15/2024	Deschutes NF, Bend Ft. Rock RD	Bend	24-01	USFS	618.3	24
05/16/2024	Deschutes NF, Bend Ft. Rock RD	Bend	24-02	USFS	433.6	24
05/21/2024	Deschutes NF, Bend Ft. Rock RD	Bend & Redmond	24-03	USFS	288.9	24
05/30/2024	Deschutes NF, Bend Ft. Rock RD	Bend	24-04	USFS	623.2	24
11/07/2024	CFPA	Coos Bay	24-05	Private	85.4	1

# Figure 4A PRESCRIBED BURNING EMISSIONS ESTIMATE



# Figure 4B WILDFIRE EMISSIONS 2

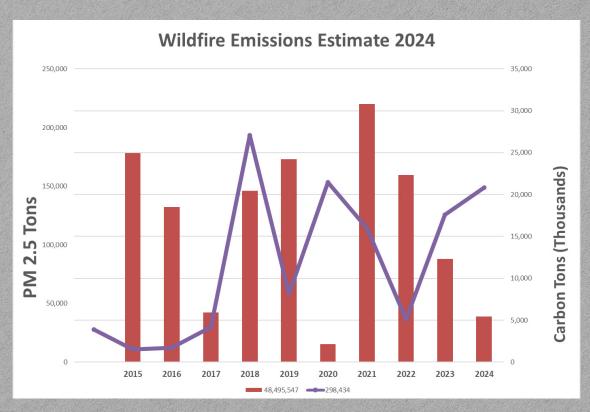
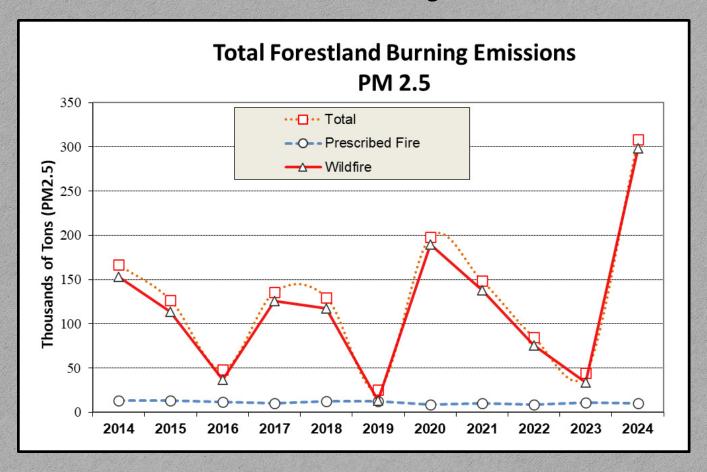


Figure 5
Total Forestland Burning Emissions



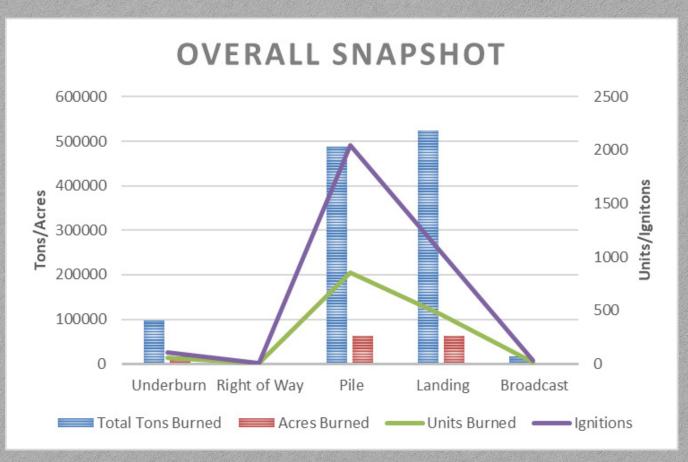


Figure 6
Historical Accomplishment Statewide

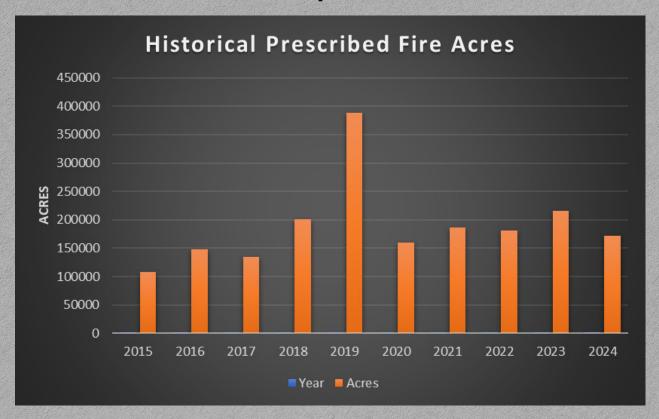


Figure 7
Historical Accomplishment Statewide



# Figure 8 Monthly Prescribed Acres Burned

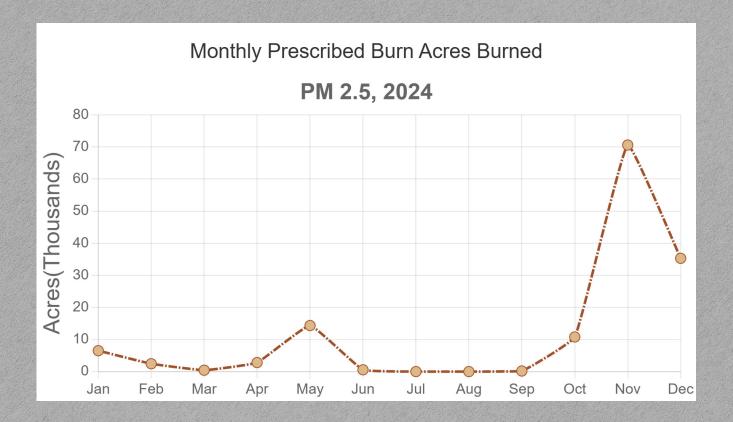
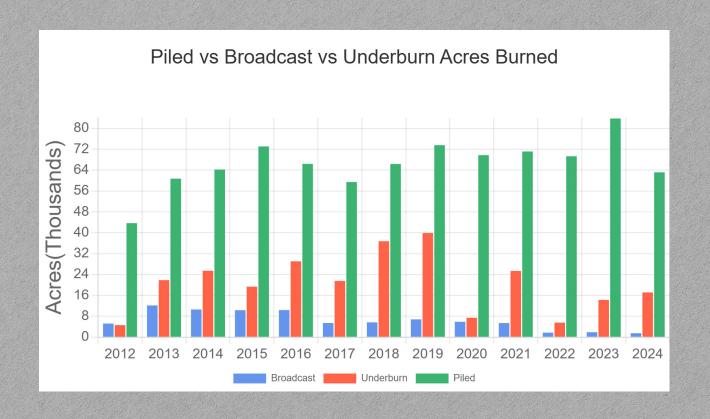


Figure 9
Piled vs Broadcast vs Underburn



# Table 4 Accomplished by District

Douglas FPA	56924	11200	54
Forest Grove	21425	3874	40
Fremont NF	46475	4304	6
Klamath NF	15	5	1
Klamath-Lake	900	1392	1
Malheur NF	24585	4614	4
Mt. Hood NF	7271	1264	37
North Cascade	50333	3441	54
Northeast	40068	4962	44
Ochoco NF	14073	3671	0
Oregon Caves NM	6	1	1
Rogue-Siskiyou NF	21208	3060	34
Siuslaw NF	3053	1773	6
South Cascade	57431	9659	152
Southwest	65506	11356	201
Tillamook	31631	4115	64
Umatilla NF	17257	1940	10
Umpqua NF	7850	660	28
Walker Range	0	0	0
Wallowa-Whitman NF	54195	7934	123
West Oregon	79555	9937	190
Western Lane	32196	5775	76
Willamette NF	4358	910	23
Winema NF	162572	20138	16