

# **PRESCRIBED FIRE, SMOKE AND PUBLIC HEALTH:**

A Community Response Plan for the Lakeview Smoke Sensitive Receptor Area



## Declaration of Agreement

Lake County Public Health, the Lakeview City Council, in coordination with the Lake County Board of County Commissioners, has reviewed and approved the Lakeview Smoke Sensitive Receptor Area Community Response Plan (Lakeview SSRA CRP). Per OAR 629-048-0180 of the 2019 Oregon prescribed fire Smoke Management Plan, the Town of Lakeview and Lake County jointly agree to submit the Lakeview SSRA CRP to the Oregon Department of Forestry and Oregon Department of Environmental Quality as a formal request for exemption from the 1-hour smoke intrusion threshold for the Lakeview SSRA.



Ray Turner, Mayor  
Town of Lakeview

6-7-2021

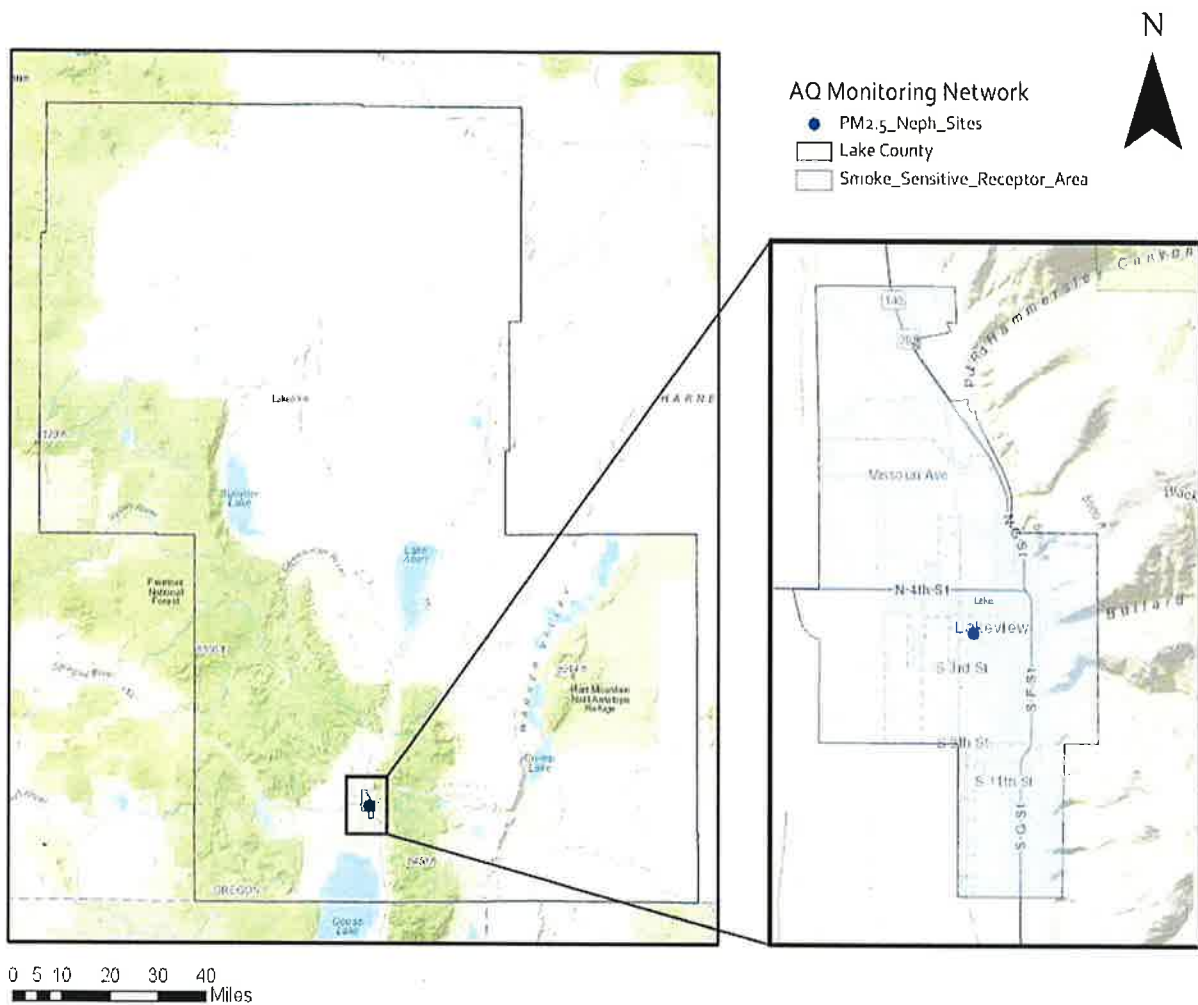
Date



Barry Shullanberger, County Commissioner  
Lake County

6/7/2021

Date



**Figure 1. Lake County, Lakeview SSRA Monitor Map.** The Lakeview SSRA is shown on the map as well as the location (blue) of the Air Quality monitoring station.

### **Rationale for the Lakeview SSRA Community Response Plan**

Lakeview is in Lake County in South-Central Oregon. According to 2018 Census data, Lake County's total population is approximately 7,869 (*Source: American Community Survey, U.S. Census Bureau, 2019 population estimates*). Lake County's climate is semi-arid with long severe winters and short dry summers. With a typical high desert climate, the County experiences over 300 days of sunshine per year and receives an average of 15 inches of annual precipitation. Warm and sunny days of summer record highs in the 80s with cool nights. Data taken from Remote Automatic Weather Stations (RAWS) show a significant increase in moisture as elevation increases. The low precipitation and high wildfire risk months are typically July, August, and September. However due to climate change, wildfires are starting earlier and ending later, are larger and more severe, and resulting in loss of homes, forests, and other resources. Past and current management practices, including fire exclusion, have left forests in dry regions stressed from drought, overcrowding, and at risk of insect and disease outbreaks.

### **Reintroduce and Maintain Fuels Reduction with Fire as an Ecological Process**

There is a need to reintroduce fire as an ecological process and to maintain the high investments in thinning /fuels reduction treatments. Recent studies suggest there is an enormous deficit of frequent, low-severity fire degrading ecosystems in South-Central Oregon and large low severity fires may have been critical to maintaining forest patterns resistant and resilient to fire and drought (Hagmann 2013). Dry forest restoration treatments in fire-dependent ponderosa pine forests that reduce tree density increase ecosystem resilience in the short term, while the reintroduction of fire is important for long-term resilience. (Hood et al. 2016).

### **Ongoing Partnership Efforts Related to Reintroducing Fire on the Landscape**

The Klamath-Lake Forest Health Partnership (KLFHP), formed in 1993, is a cooperative network of diverse local and regional partners who cooperate to address forestland management/restoration in Klamath and Lake Counties. The KLFHP is committed to: 1) providing technological and ecological information on forest health; 2) serving as a resource for all forest landowners in diagnosing and addressing forest health problems (including management recommendations based on the latest science); 3) working cooperatively with landowners, the general public, and forest operators to educate and encourage best management practices on forest lands; and 4) using innovative partnerships and funding sources to increase the pace, scale, and scope of restoration across public and private lands. The core partners (including representatives from Lake County Umbrella Watershed Council, Klamath Watershed Partnership, Fremont-Winema National Forest, Oregon Department of Forestry, Oregon State University College of Forestry Extension, USDA Natural Resources Conservation Service, Lake County Resources Initiative, Lake County Cooperative Weed Management Area, Oregon Department of Fish and Wildlife, The Lakeview Stewardship Group, Lake County Soil and Water Conservation District, Bureau of Land Management, and Oregon Prescribed Fire Council) attend monthly KLFHP meetings and additional project-level subcommittee meetings. More information on the KLFHP can be found at <https://www.klfhp.org>

In recent years several grants have been awarded to the KLFHP for restoration. In Lake County specifically on behalf of the KLFHP the Lake County Umbrella Watershed Council (LCUWC) received a grant from the Oregon Watershed Enhancement Board (OWEB) in 2016 to start developing landscape, cross-boundary efforts in Lake County with the North Warner Multi-Ownership Forest Health Project (North Warner Project). The North Warner Project spans 162,400 acres of public and private land with 30 private landowners in Lake County. The KLFHP has mapped and assessed 32,000 acres of private land, leveraged \$7 million of funding (over four years), and restored dry forests on approximately 21,292 acres of private land and 15,249 acres of Forest Service (USFS) managed public land through various thinning (commercial and pre-commercial) treatments (see **Figure 2** below and **Appendix A**). Preparations are in place to reintroduce and maintain this landscape with prescribed fire, read more details at <https://klfhp.org/northwarner>

In 2021, the LCUWC was awarded another OWEB grant titled The Lake County All Lands Restoration Initiative Mini FIP (Focused Investment Partnership) which will focus on the North Warner and Thomas Creek Projects located immediately adjacent to each other. The focus on dry forest restoration will be to complete thinning treatments in forested communities and to utilize prescribed fire as a follow-up within the North Warner Project, while beginning thinning treatments within the Thomas Creek Project in preparation for future prescribed fire. The total area covers 278,633 acres and includes: 252,465 acres of wildland urban interface (WUI) as identified in the Lake County Community Wildfire Protection Plan (CWPP) near the communities of Lakeview, Valley Falls, and Paisley.

Through coordinated efforts across the Lake County All Lands Restoration Initiative landscape there is ample opportunity to reintroduce fire at larger scales and across ownership boundaries. This is supported by Hessburg et al. which suggests treatments across public and private land through the planning, implementation and monitoring process will expand options for management and create synergies that are otherwise unavailable (2015). For example, the opportunity for prescribed fire on private lands as an ecological process (Leavell et al. 2018) may become an option for landowners through coordinated efforts with adjacent federal agencies, based on coordinated cross-boundary thinning treatments. Coordinated efforts may also open the opportunity to manage a wildfire to meet resource objectives. Thinning on private land and building relationships with private landowners in advance of a wildfire, increases the possibility and likelihood for success.

In 2018, South-Central Oregon formed a chapter to the Oregon Prescribed Fire Council to assist with advancing the use of fire as an ecological process within the area. The mission of the Oregon Prescribed Fire Council is to serve as a venue for practitioners, state and federal agencies, academic institutions, tribes, coalitions, and interested individuals to collaboratively promote and conserve the fire adapted natural ecosystems in Oregon, and expand the responsible use of prescribed fire. Effectively advancing the use of fire across ownership boundaries involves great coordination, expertise, agreements, and stakeholder support. The formation of the South-Central Oregon local chapter, organized through the KLFHP, will assist with expanding the use of prescribed fire within the Lake County All Lands Restoration Initiative landscape, as well as other projects surrounding the Lakeview SSRA (see **Appendix B**, proposed Prescribed Burning and Recent Wildfires Map).

With the above planned efforts, the Town of Lakeview, and Lake County plan to submit the Lakeview SSRA CRP to ODF and DEQ as part of a formal request under the Oregon SMP for an exemption from the 1-hour smoke intrusion threshold. It is from these future prescribed burn areas that, due to topography and seasonal nighttime temperature inversions, residual prescribed fire smoke could potentially settle into the Lakeview SSRA causing short-duration smoke impacts that could periodically exceed the 1-hour smoke intrusion threshold (see section titled Fire, Smoke and Air Quality Analysis for the Lakeview SSRA CRP below for further detail).

### **State-Required Components of the Community Response Plan**

As required by the Oregon Smoke Management Plan (SMP), the Lakeview SSRA CRP has been coordinated through the local public health authority, which due to COVID-19 was represented by a member of the Lake County Board of Commissioners, and was developed collaboratively with input from members or representatives of vulnerable populations, community officials, representatives from entities that have responsibility for prescribed fire, forest restoration collaborative groups, local businesses, hospitals and schools, and other interested members of the public.

As the Oregon SMP states, ODF and DEQ "recommend communities that are SSRAs and have experienced repeated smoke incidents and/or intrusions in the past collaboratively develop a community response plan and program. Within the SMP, OAR 629-048-0180, Section 2 spells out the following required components of such a plan:

1. A description of populations in an SSRA community that are vulnerable to the health effects of short-term smoke;
2. Adequate means by which the public, especially vulnerable populations in the SSRA community, will be notified in a clear and reliable way of anticipated smoke impacts in a timely manner;
3. Adequate options for protecting the health of vulnerable populations (or helping such populations to protect themselves) from short-term exposure to smoke, and;
4. A plan and program for communications between the entities that conduct prescribed fire, the local public health authority, and the community's public and vulnerable populations who may be impacted by smoke.

Beginning in early 2020, stakeholders in Lakeview (including at times representatives from Lake County Board of Commissioners, Lake County Public Health, Lakeview Town Council, Lake County Sheriff's Department, USFS Fremont-Winema National Forest, Bureau of Land Management Lakeview District, Oregon Department of Forestry, Department of Environmental Quality, Lake Community Partnership, Lake County Chamber of Commerce, Lake County School District #7, Lake District Hospital, Klamath Lake Forest Health Partnership and Forest Stewards Guild) began meeting to develop a strategy to address the components outlined above and the need for community outreach regarding fire, smoke, and public health in Lakeview and the surrounding area. The outcome of this work has culminated into the following mitigations outlined in this report.

### **Components of the Lakeview SSRA Community Response Plan**

In developing the Lakeview SSRA CRP, including the state-required components detailed below, we have relied on communication best-practices gleaned from the best available social science related to community engagement and communications during wildland fire and smoke events.

**Table 1.** Lake County SMCRP Demographic Information

<b>Data Category</b>	<b>Estimated Total # People</b>	<b>% of Population</b>
Total Population	7869	
Pregnant Women	68	0.8%
Persons <5 years old	386	4.9%
Persons between 6 -18 years old	1503	19.1%
Persons >65 years old	2006	25.5%
<b>Chronic Illness</b>		
Adults (>18) report they have asthma	700	11.9%
Grant/Harney/Lake 8 <sup>th</sup> graders report they have asthma		11.1%
Grant/Harney/Lake 11 <sup>th</sup> graders report they have asthma		5.7%
Adults (>18) report they have Chronic Obstructive Pulmonary Disease (COPD)	500	6.4%
Adults (>18) report they have cardiovascular disease	1000	12.7%
Adults (>18) report they have coronary heart disease (angina)	400	5.1%
Adults (>18) report they have had heart attacks	668	8.5%
Adults (>18) report they have had strokes	275	3.5%
<b>Smokers</b>		
Adults (>18) who currently smoke cigarettes	748	9.5%
Grant/Harney/Lake 8 <sup>th</sup> graders report smoking cigarettes over past 30 days		2.9%
Grant/Harney/Lake 11 <sup>th</sup> graders report smoking cigarettes over past 30 days		5.0%

**Table 2.** Comparing Lake County to State of Oregon

<b>Illness/Category</b>	<b>Lake County</b>	<b>State of Oregon</b>
Asthma	11.9%	11%
Chronic Obstructive Pulmonary Disease (COPD)	6.4%	5.6%
Coronary Heart Disease	3.5%	3.4%
Heart Attacks suffered	8.5%	3.6%
*Data are age-adjusted rates, may be statistically unreliable, and should be interpreted with caution. Data is from the Oregon Behavioral Risk Factor Surveillance System (BRFSS), 2017.		

Overall, 30% of Lake County’s population falls into a smoke vulnerable category simply based on the age categories of under 5 or over 65. With the median age of 48, making it the county with the oldest median age in the region. The median age in Lake County is eight years above the statewide median, meaning the percent of the population that will be 65 and over in the coming years will most likely increase. It is critical to ensure that the most smoke-vulnerable individuals in the

website. The SCOFMP partnership is an interagency fire management program that strives to provide comprehensive prescribed and wildland fire service to South-Central Oregon and northwest Nevada. The impetus for the revision and improvement of the website came from a collaborative effort involving the ODF, Lakeview Interagency Fire Center (LIFC), Fremont-Winema National Forest, Bureau of Land Management Lakeview District, Lake County Public Health Services, DEQ, and the KLFHP who together recognized the need for agreed upon language and a corresponding central website to serve as a clearinghouse for information regarding wildland fire (prescribed and wildfire), smoke impacts, air quality conditions, and public health recommendations. From this platform, we hope to provide a range of information, tools, and resources regarding wildfires, planned prescribed fires, smoke impacts, air quality, and public health information serving all South-Central Oregon, including Lake and Klamath counties. Components of the website will include:

1. A “one-stop-shop” for important information, key messages, and recommendations addressing:
  - a. The purpose and importance of prescribed fire (why is prescribed fire essential to make our forest healthier and our communities safer)
  - b. When and where prescribed fire is planned (advance notification of prescribed fire locations and emergency notifications of smoke intrusions)
  - c. Strategies employed to reduce emissions from prescribed fire (what is being done to minimize smoke impacts during prescribed fires)
  - d. The health impacts of smoke from all sources (air quality index)
  - e. Recommendations to reduce exposure and mitigate potential health impacts caused by smoke (what can people do to protect themselves from smoke)
2. Blog and subscription-based news feeds providing press releases from local, county, state, and federal partner organizations regarding prescribed fire, smoke, and air quality.
3. Embedded interactive prescribed fire planning and implementation map providing real-time updates about planned, upcoming, and completed prescribed burning
4. Embedded interactive Air Quality Index map for current air quality information provided by DEQ;
5. Information and instructions for using the 5-3-1 Visibility Index when/where air quality monitoring data is not available, and;
6. Links to online resources provided by other agencies, such as Oregon Health Authority.

It will also be designed to transition easily between wildfire and prescribed fire seasons, so that the information and overarching communication and engagement strategy is relevant and applicable regardless of the source of smoke.

To assure that these communication methods are reaching the intended audiences and providing information that is relevant to the public, we will not just rely on the new and improved SCOFMP website alone but will also incorporate:

**Lake County Library District - Main Library** will participate as a representative of children 18 years and younger and other smoke vulnerable citizens within our community. The Library currently has a state-of-the-art HVAC in the building and recently included air quality filtration units throughout the building in response to COVID-19. The Smoke Management Community Planning and Mitigation Grant purchased replacement filters for all the HEPA units within the building.

**Future Actions:**

- Continued development and completion of the SCOFMP website by the spring of 2022.
- Continued opportunity for residents to be a part of the HEPA distribution program.
- Expected smoke and emergency notification about smoke via Alert Sense messaging.
- Conduct an annual community-wide survey to assure that these communication methods are reaching the intended audiences and providing information that is relevant to the public. This survey will capture information on where the participants turn for information about fire, smoke, and public health, as well as resources that they feel are lacking, and feedback on how to improve communication. Annual survey results will be used to continually improve the program and inform outreach in the community each year.

**3. Options to Protect Public Health & Mitigate Exposure to Smoke**

A great deal of work happens in the forest before a prescribed burn is conducted, including thinning, removing trees/brush, and/or burning slash piles. Completing these steps reduces the amount of combustible material available to burn, which in turn reduces the intensity of the fire and helps ensure that prescribed burns produce less smoke, achieve forest restoration goals, and can be safely controlled.

During prescribed burn operations, a great deal of care and attention is paid to monitoring changing weather, fuel, and fire behavior, as well as where smoke is going during and after prescribed fires, to minimize smoke impacts to nearby communities. Nonetheless, some smoke in the air is inevitable during burn operations and the night and early morning immediately after prescribed fires.

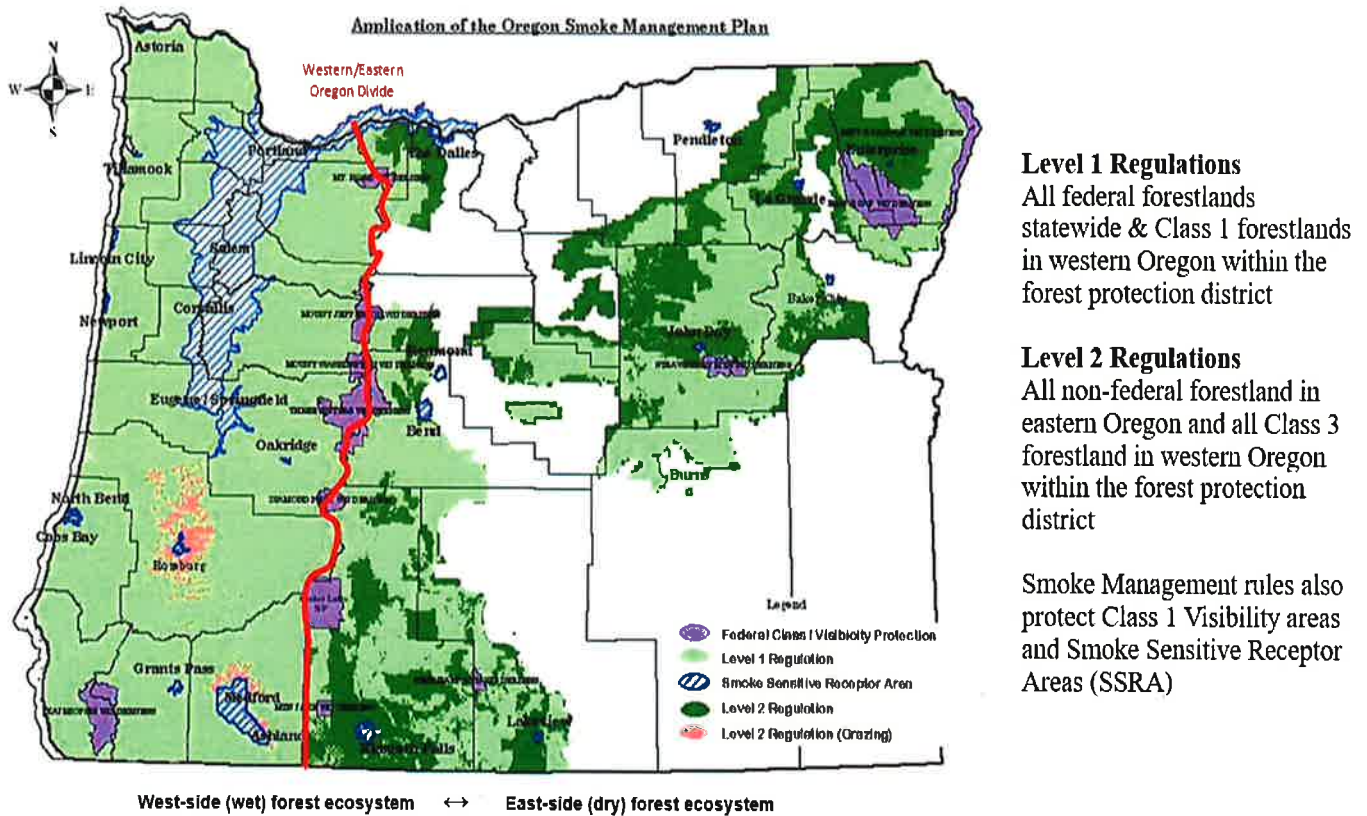
**Key Messages to Community on Mitigating Exposure to Smoke:** Smoke is made up primarily of small particles, gases, and water vapor. These particles can be inhaled deeply into the lungs, damaging lung tissue and causing respiratory and cardiovascular problems. Regardless of the source, smoke is a form of air pollution that can pose a health risk.

Symptoms of short-term smoke exposure can include:

- Watery or dry eyes
- Persistent cough, phlegm, wheeze, scratchy throat, or irritated sinuses
- Headaches
- Shortness of breath, asthma attack, or lung irritation
- Irregular heartbeat, chest pain, or fatigue

#### 4. Oregon Smoke Management Designation

Lake County is in South-Central Oregon and has land managed under four different components of the Oregon Smoke Management Plan: Level 1 Regulations, Level 2 Regulations, Federal Class I Visibility Protection Areas, and a Smoke Sensitive Receptor Area (the City of Lakeview) SSRA. **Figure 4** below is a map of applications of the Oregon smoke management plan.



**Figure 4:** Applications of the Oregon Smoke Management Plan

**Level 1:** All federal forestland in Oregon falls under Level 1 Regulations. These lands are required to register a thorough burn plan at least seven days in advance. These plans include how weather will be monitored, identify appropriate resources to accomplish ignition sequence and control the fire, reduce pre-burn fuel loadings, and how the burn will minimize smoke entering SSRA's or other communities. These lands are subject to fee administration, must follow the Smoke Management forecast instructions, and are required to report accomplishments the next business day following each day's ignition.

**Level 2:** All non-federal forests in eastern Oregon fall under Level 2 regulations. This includes all of Lake County's private ground. These lands are required to register any prescribed burns through ODF who will input it in the Oregon Smoke Data System. Operators and landowners are also required to report accomplishments to ODF by the first business day of the week following ignition but are not subject to fee administration or compliance with smoke management forecast

as defined in OAR 629-048-0005 or Smoke Intrusion as defined in OAR 629-048-0005(27).

The Fremont-Winema National Forest and Bureau of Land Management Lakeview District are interested in cultivating public relationships, cleaner air quality, and environmental conservation. Both agencies are also interested in reducing fuel on public lands by using prescribed fire to improve landscapes, which reduces the buildup of fuels contributing to high intensity and high severity fires. By decreasing air pollution, the Fremont-Winema National Forest and Bureau of Land Management Lakeview District benefit from complying with the Clean Air Act, improving public health and safety, and conserving the environment for future generations.

The Town of Lakeview and Lake County are interested in public safety and health and a clean livable environment. Citizens, both in Lakeview and nearby, actively engage in controlling emissions, which avoids creating air pollution on low air quality days. The Town of Lakeview and Lake County benefit when their citizens are healthy and not impacted by unnecessary smoke exposure. With cleaner air, health costs for the community decrease and people spend more time maintaining their health and pursuing their goals. Likewise, local businesses thrive when residents can be outside and partake in commerce, which in turn, boosts the economy.

The DEQ's mission is to be a leader in restoring, maintaining, and enhancing the quality of Oregon's air, land, and water. DEQ is interested in clean air and protecting public health throughout Oregon and particularly in near nonattainment areas, such as Lakeview. When air pollution is reduced, DEQ benefits because air quality is restored, maintained, and enhanced, and public health is preserved, which fulfills their mission.

The ODF's mission is to serve the people of Oregon by protecting, managing, and promoting stewardship of Oregon's forests to enhance environmental, economic, and community sustainability. ODF assists private landowners through the fire protection program and administering the Oregon Forest Practices Act. ODF provides forestry expertise and implements projects on USFS land through Good Neighbor Authority agreements and on private land through Stewardship Forester positions and the statewide cooperative agreement between NRCS and ODF when expending Environmental Quality Incentives Program (EQIP) funding. ODF also gains funding, such as USFS State and Private funding, for implementing restoration on private lands. ODF is the lead agency in providing forestry expertise to private landowners.

By all parties working together, the Fremont-Winema National Forest and Bureau of Land Management Lakeview District can still achieve fuels reductions on federal lands while collaborating with the Cooperators to ensure burning is conducted on days least affecting citizens within the Lakeview Forest Smoke Management Area (LFSMA). In effect, the DEQ's goal of improving air quality in Lakeview will be attainable during this designated timeframe. Each agency mutually benefits from clean air in the Lakeview area when residents' quality of health is improved, partnerships are strengthened between all agencies, and environmental conservation is protected.

The Air Quality Index (AQI) is a daily index of air quality based on three pollutants regulated by the federal Clean Air Act: ground-level ozone, particle pollution (PM<sub>2.5</sub>), and nitrogen dioxide (Oregon.gov 2020). It provides information on how clean the air is and potential health risks associated with the air quality. The EPA and DEQ (<https://oraqi.deq.state.or.us/home/map>) update the AQI hourly for each monitoring station in the state. **Table 3** below shows the current AQI numbers, corresponding PM<sub>2.5</sub> levels, health concerns, and colors that are used to communicate impacts to health from air quality.

**Table 3.** The Air Quality Index, breakpoints, and health effects (EPA 2021).

AQI Category and Color	AQI	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	Health Advisory
Good	0-50	0.0-12	Air quality is satisfactory, and air pollution poses little or no risk.
Moderate	51-100	12.1-35.4	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101-150	35.5-55.4	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Unhealthy	151-200	55.5-150.4	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	200-300	150.5-250.4	Health alert: The risk of health effects is increased for everyone.
Hazardous	301-500	250.5-500	Health warning of emergency conditions: everyone is more likely to be affected.

We have sought to better understand the duration, magnitude, time of day, smoke source location, and seasonality of both wildfire and prescribed fire smoke impacts in the Lakeview SSRA. The Lakeview area has one particulate (PM<sub>2.5</sub>) monitoring site with the sampler located on the corner of Center and M Street in downtown Lakeview. DEQ has monitored at this site since 1991 for PM<sub>10</sub> and since 2007 for PM<sub>2.5</sub>. The location represents one of the higher PM<sub>2.5</sub> concentration areas and is representative of areas where people live, work, and play. Detailed analysis of air quality data from the Lakeview Center and M Nephelometer, as well as statewide permanent air quality monitoring sites, highlights the following important facts that inform the Lakeview SSRA CRP and our strategy regarding fire, smoke, air quality, and public health messaging. **Figure 6** below illustrates the Lakeview air quality monitoring station's 2019 Air Quality Index indicating the maximum PM<sub>2.5</sub> (ug/m<sup>3</sup>) which includes all sources of potential air pollution particulates (woodstoves, fires, dust, cars etc.).

## 2. Characteristics of Prescribed Fire Smoke Events & Impacts

Prescribed fire smoke events in the Lakeview SSRA demonstrate an occasional intrusion of smoke from activities in the past 11 years. However, the rules at the time had the ODF forecasters approving burns only where they believed the Town would not be impacted, meaning there was a zero-smoke intrusion into Lakeview target for prescribed burning projects. Despite this there were a few intrusions into the area over the years, yet the work in the forest was often not accomplished or accomplished on a much smaller scale than needed or desired.

Analysis of hourly air quality data from the Lakeview Center and M Station Nephelometer reveals in terms of the duration, magnitude, time of day, smoke source location, and seasonality of historical prescribed burn smoke impacts in the Lakeview SSRA.

For all prescribed fire smoke events between 2007 and 2020 we found that:

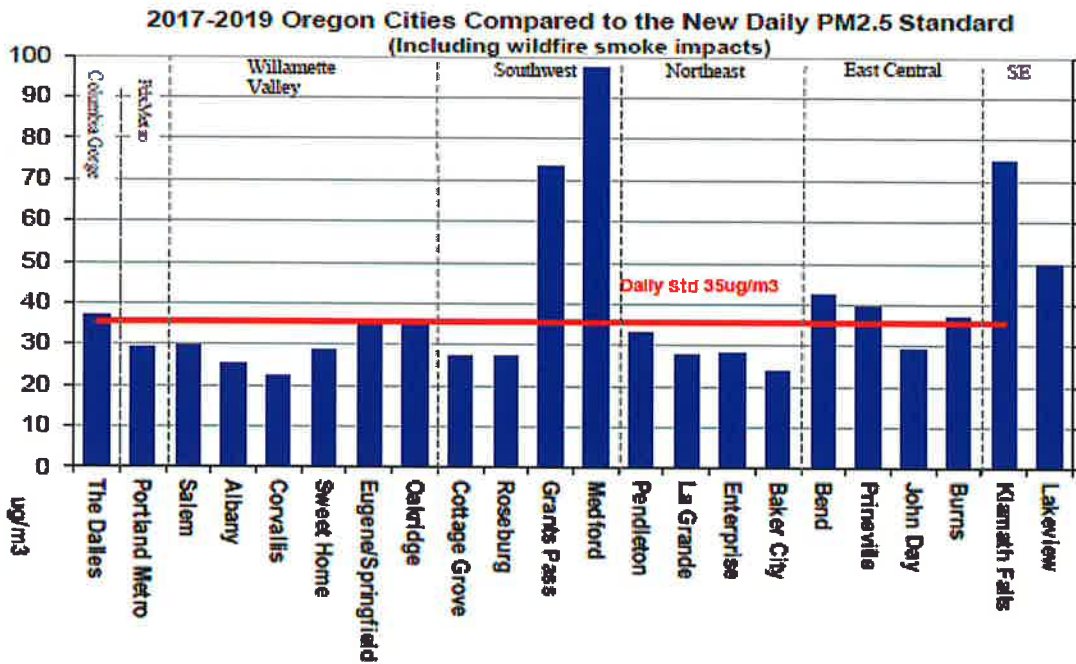
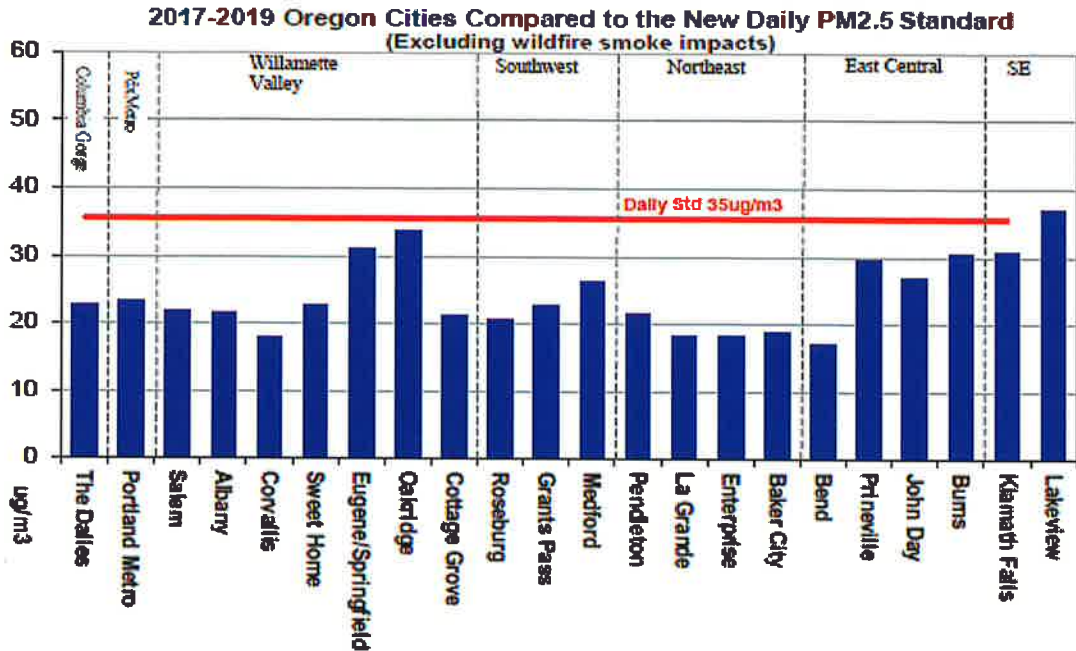
- The average duration of degraded air hours (i.e., moderate, or worse) was just over 4 hours
- The average 24-hour PM<sub>2.5</sub> concentration was 10-15 µg/m<sup>3</sup>, within the good Air Quality Index category; yet the higher spikes of smoke were enough to negatively impact the vulnerable population if or when smoke was around them without warning.
- The average time of day of the max PM<sub>2.5</sub> concentration was late morning and evening.
- There were 5 intrusions since 2007 into Lakeview, mostly at a moderate level.
- Some were in the Fall and some in the Spring.

**Table 4.** Prescribed fire smoke events between 2007-2020 as measured at the Lakeview federal reference monitoring station.

Date	Station	High PM	Time	24hr Avg	Acres	Duration	AQI category
10/11/09	Lakeview	39.3	15:00	15.3	200	2.0hrs	Heavy
09/03/10	Lakeview	66.9	10:00	10.9	300	3.5hrs	High Moderate
04/26/13	Lakeview	67.8	18:00	10.7	250	5.0hrs	High Moderate
05/12/16	Lakeview	22.2	0:00	4.7	300	4.0hrs	Light
05/24/17	Lakeview	44.0	13:00	9.7	150	9.0hrs	Moderate

## 3. Prescribed Fire Smoke & the National Ambient Air Quality Standard (NAAQS) for PM<sub>2.5</sub>

According to DEQ, particulate matter (PM) is comprised of extremely small particle and liquid droplets found in the air. Some of these particulates are a source of pollution and can be harmful for your health, including the particulates from woodstoves, fires, dust, cars, etc. PM<sub>2.5</sub> refers to particulate matter that is 2.5 microns in diameter and smaller. PM is measured in micrometers (microns, µm). This size of particulate is especially harmful when breathed in because the natural filters in our bodies cannot trap it. PM<sub>2.5</sub> can be inhaled deep into lungs and remain for weeks, which can lead to new health conditions or aggravate existing health conditions such as asthma, COPD, respiratory issues, heart disease, and other cardiovascular



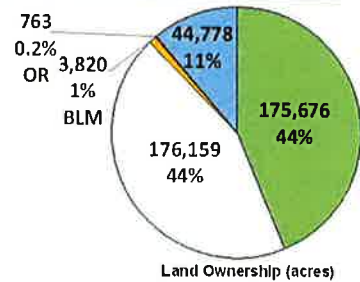
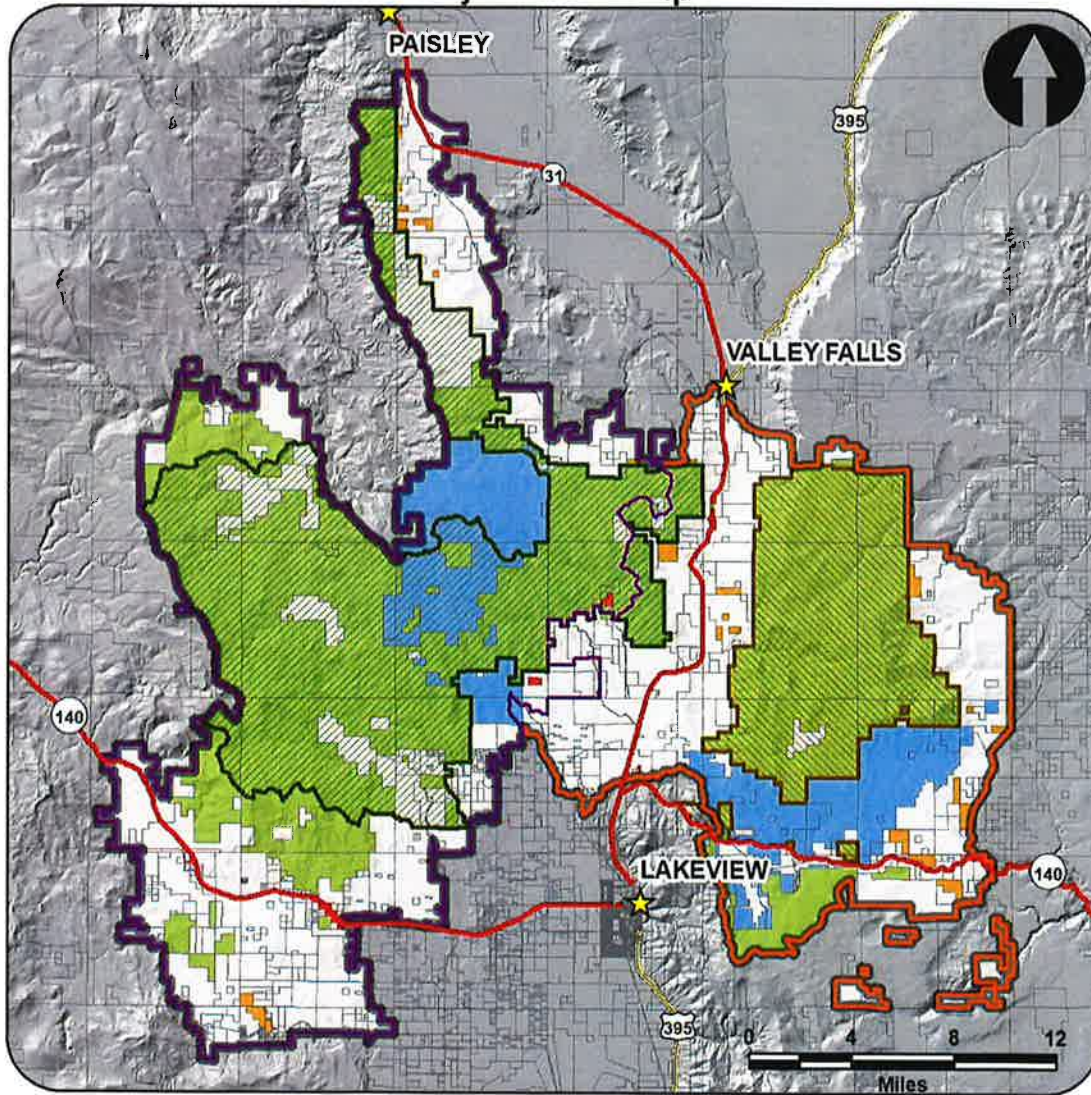
**Figure 7 and Figure 8.** The three-year average 98<sup>th</sup> percentile PM<sub>2.5</sub> (daily standard) and annual average PM<sub>2.5</sub> (annual standard) levels excluding and including (respectively) wildfire smoke impacts.

All this data notwithstanding, and even though regional wildfire smoke is treated as an exceptional event (does not count toward attainment status) when considering ongoing Clean Air Act attainment status, the regional economic impacts of *summer wildfire* smoke have been damaging to



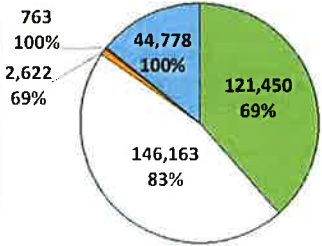
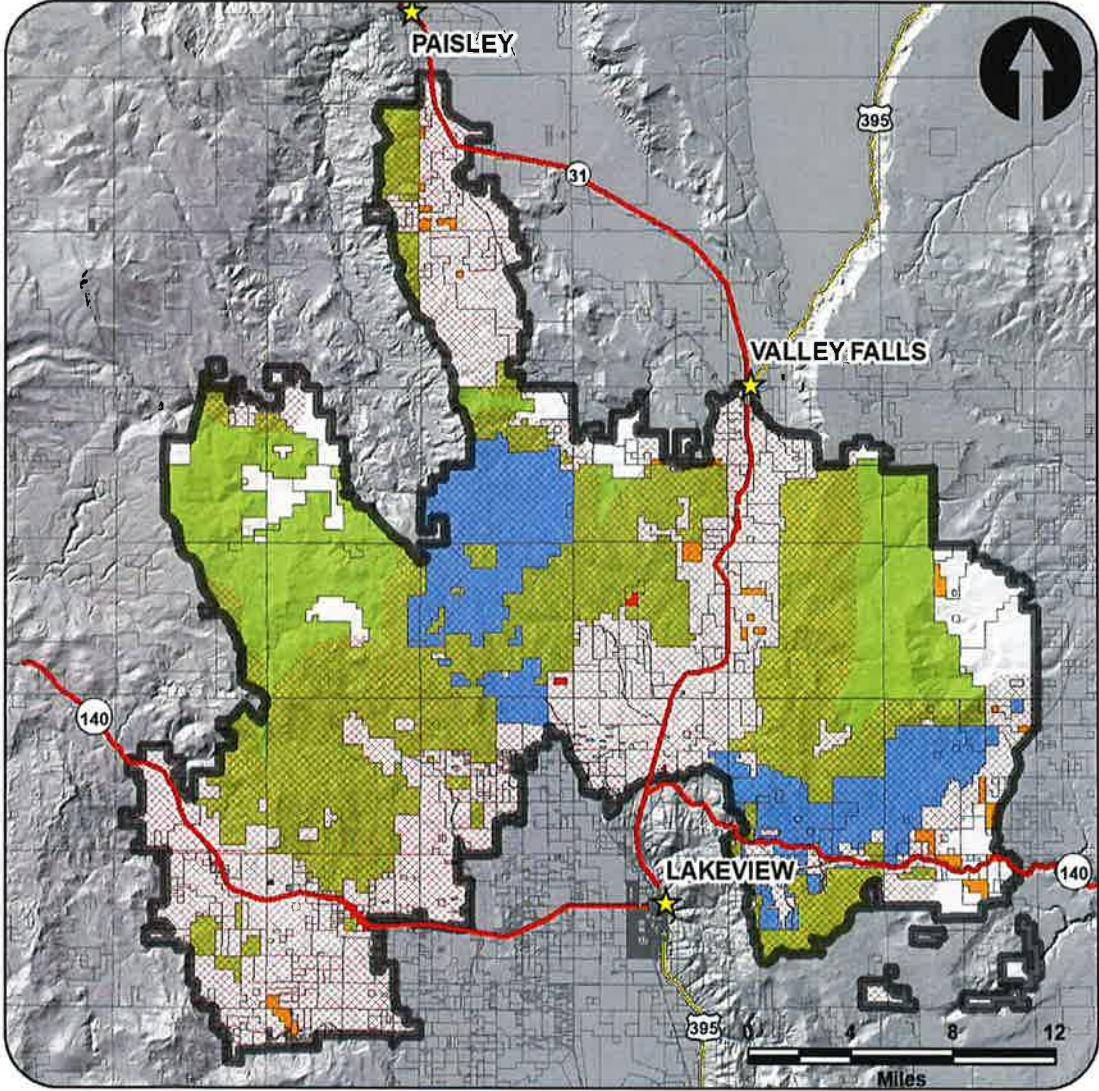
Map 2. Ownership

### Lake County All Lands Restoration Initiative Project Ownership



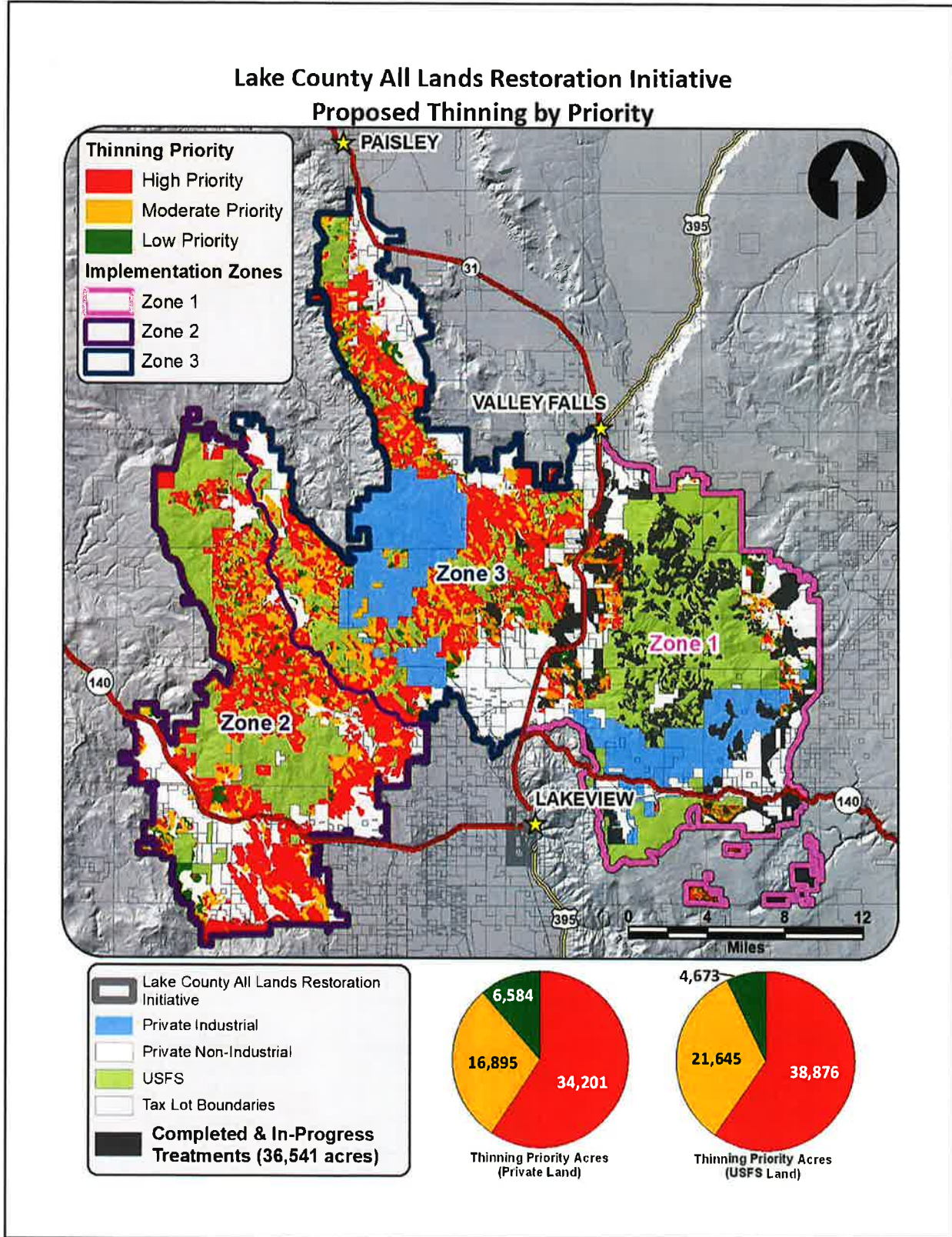
Map 4. WUI within the project area

### Lake County All Lands Restoration Initiative Wildland Urban Interface



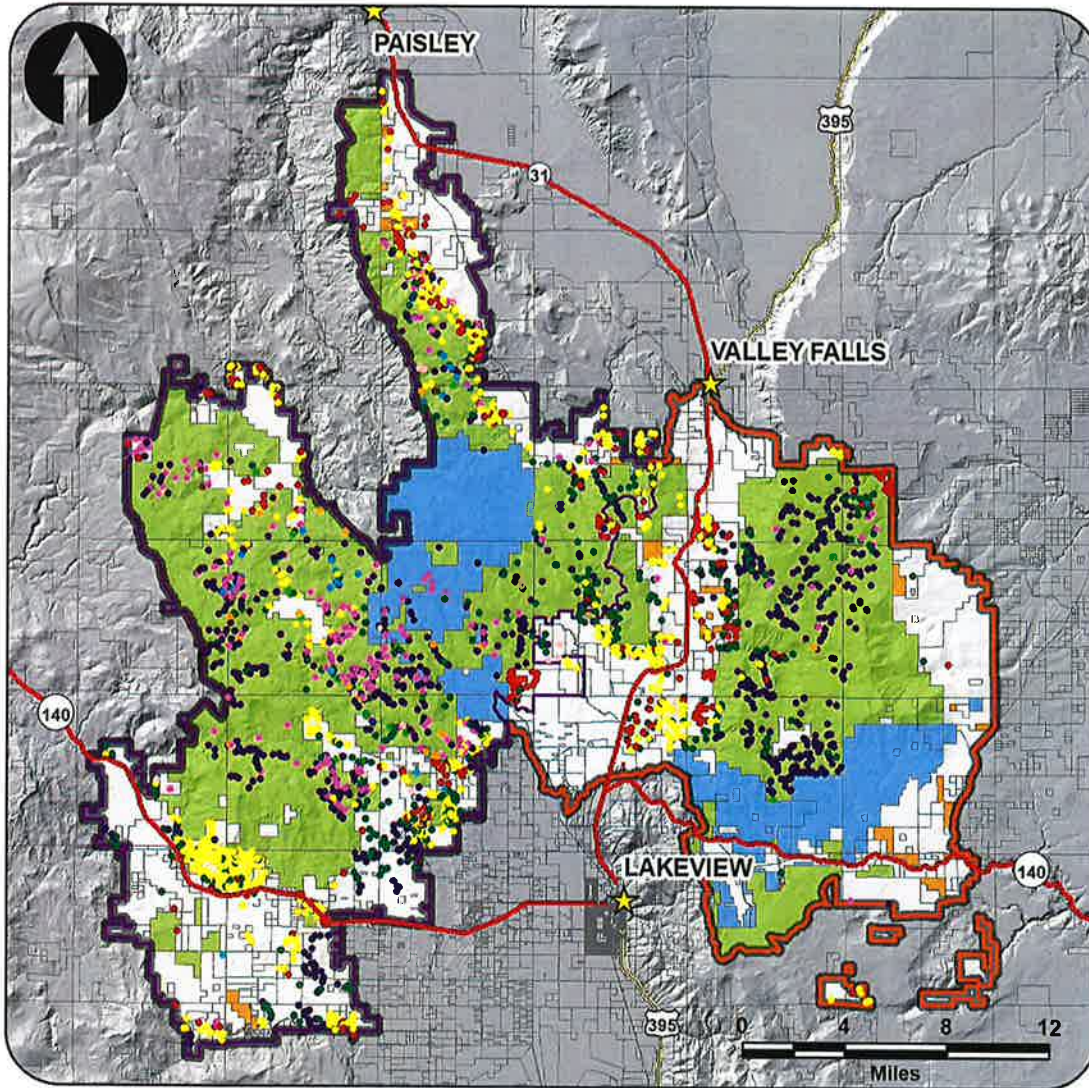
Percent and Ownership of WUI (acres)

Map 6. Proposed thinning by priority



Map 8. Noxious weed sites

### Lake County All Lands Restoration Initiative Noxious Weed Sites



- Lake County All Lands Restoration Initiative
- Thomas Creek
- North Warners
- Tax Lot Boundaries
- Private Industrial
- Private Non-Industrial
- USFS
- BLM
- OR State

#### Noxious Weed Count (# USFS / # Private Land)

- |                              |                          |
|------------------------------|--------------------------|
| Birds Foot Trefoil (26/0)    | Medusahead (38/342)      |
| Canada Thistle (887/191)     | Musk Thistle (242/64)    |
| Common Tansy (1/0)           | Scotch Thistle (14/8)    |
| Dalmatian Toadflax (5/0)     | Spotted Knapweed (31/1)  |
| Diffuse Knapweed (2/0)       | St. Johnswort (32/3)     |
| Dyer's Woad (1/0)            | Ventenata (76/651)       |
| Field Bindweed (8/0)         | White Top (0/1)          |
| Mediterranean Sage (252/271) | Yellow Starthistle (1/5) |

## APPENDIX C: LAKEVIEW SURVEY QUESTIONS

### Public Input Needed for Smoke Communication and Response Planning

1. Do you live in the community of Lakeview?

- Yes
- No

2. Prescribed fires, also known as controlled burns, refer to the planned and controlled use of fire by a team of experts under specific conditions of temperature, wind, and humidity. Prescribed fire is used to help restore ecosystems that depend on fire, reduce the impact of wildfire, and increase community and firefighter safety. **Please select from the following list how and if anyone in your household receives information about prescribed fires. Select all that apply:**

- I have never heard of the SCOFMP prescribed fire program and have not received notifications
  - I have heard of the SCOFMP prescribed fire program but choose NOT to receive notifications
  - Newspaper articles
  - Radio advertisements
  - Alert Sense text messages
  - Oregon Department of Forestry – prescribed fire pages  
<https://www.oregon.gov/odf/fire/pages/burn.aspx>
  - South Central Oregon Fire Management Partnership (SCOFMP) Webpage  
<https://www.scofmp.org/>
  - Facebook – South Central Oregon Fire Management Partnership - SCOFMP
  - @SCOFMPFIREINFO <https://www.facebook.com/SCOFMPFIREINFO>
  - Other social media - Please list which page(s) below
  - Any other website (Please list which site below)
  - Other
- 
- 

3. Do you or someone in your household depend on medical devices (examples: supplemental oxygen, CPAP or BIPAP) or an inhaler to assist with breathing? People with these needs may be more vulnerable to smoke impacts.

- Yes
- No

8. What needs do you have to prepare for or during a smoke event (please select all that apply)?

- Advanced notice for a potential smoke event
- Understanding the Air Quality Index and taking protective action
- Education on how to keep air clean in your home
- Education on masks
- Assistance purchasing an air purifier and filters for your home
- Other (please specify)
- \_\_\_\_\_

Optional: Are you interested in being included on our eligibility list to potentially receive a free home HEPA filter? An air purifier is an important measure for creating a clean room in your home during smoky outdoor conditions. To assist individuals who are most sensitive to smoke, partners organizing through the Lakeview Community Response plan are giving away free room air purifiers to qualified applicants who will be screened based on income, medical conditions and smoke vulnerability.

Please provide your name and contact information below.

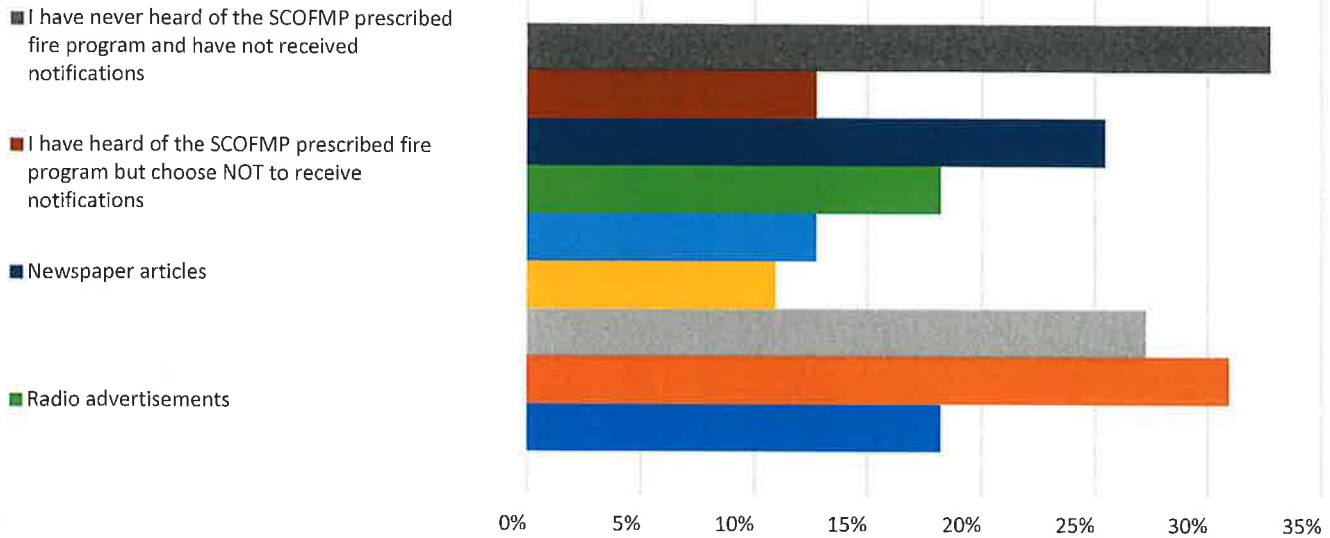
Name: \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

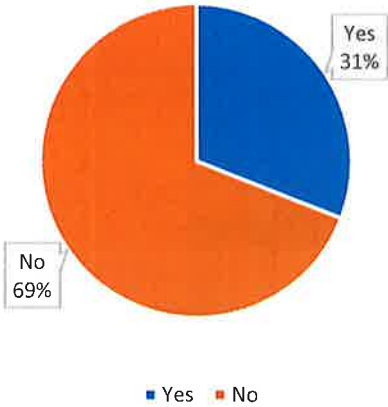
**!!!THANK YOU FOR YOUR TIME!!!**

Q2. Please select from the following list how and if anyone in your household receives information about prescribed fires. Select all that apply:



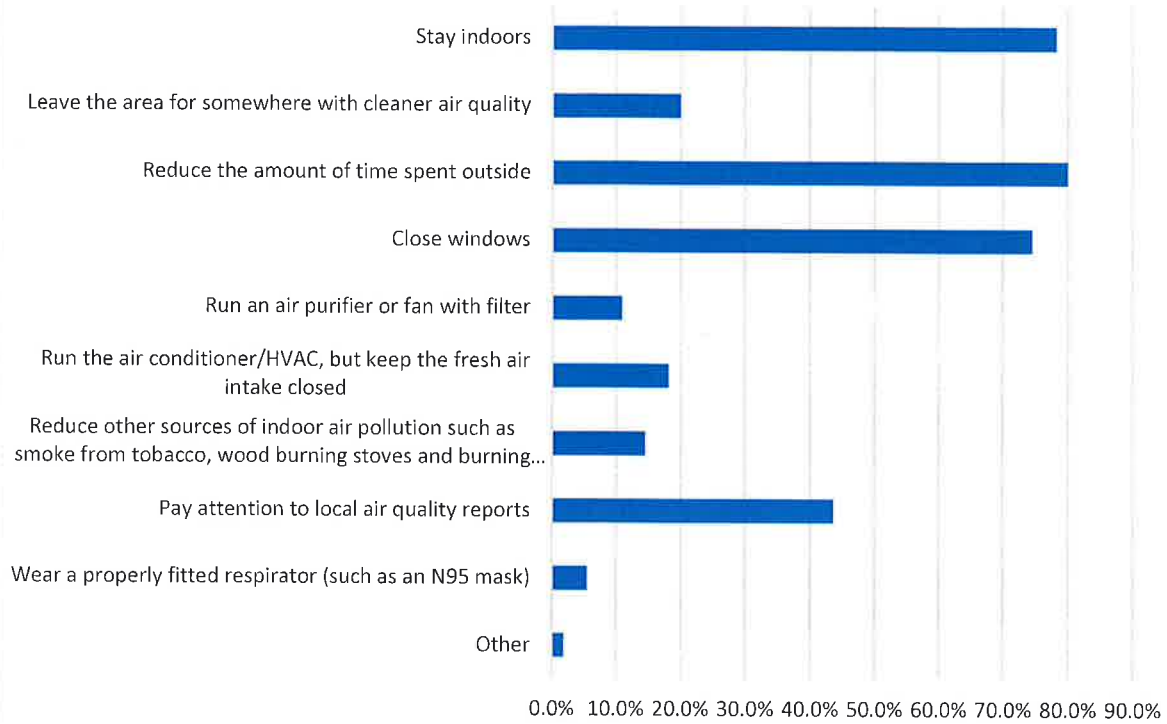
	Answer Choices	Responses	
Q2	Please select from the following list how an if anyone in your household receives information about prescribed fires.		
	I have never heard of the SCOFMP prescribed fire program and have not received notifications	32.7%	18
	I have heard of the SCOFMP prescribed fire program but choose NOT to receive notifications	12.7%	7
	Newspaper articles	25.5%	14
	Radio advertisements	18.2%	10
	Alert Sense text messages	12.7%	7
	Oregon Department of Forestry – prescribed fire pages <a href="https://www.oregon.gov/odf/fire/pages/burn.aspx">https://www.oregon.gov/odf/fire/pages/burn.aspx</a>	10.9%	6
	South Central Oregon Fire Management Partnership (SCOFMP) Webpage <a href="https://www.scofmp.org/">https://www.scofmp.org/</a>	27.3%	15
	Facebook – South Central Oregon Fire Management Partnership - SCOFMP	30.9%	17
	Other	18.2%	10
Total	Respondents		55

Q4. Does anyone in your household have respiratory issues (COPD, asthma, smoke allergies), cardiovascular issues or other conditions that make them vulnerable to smoke exposure?



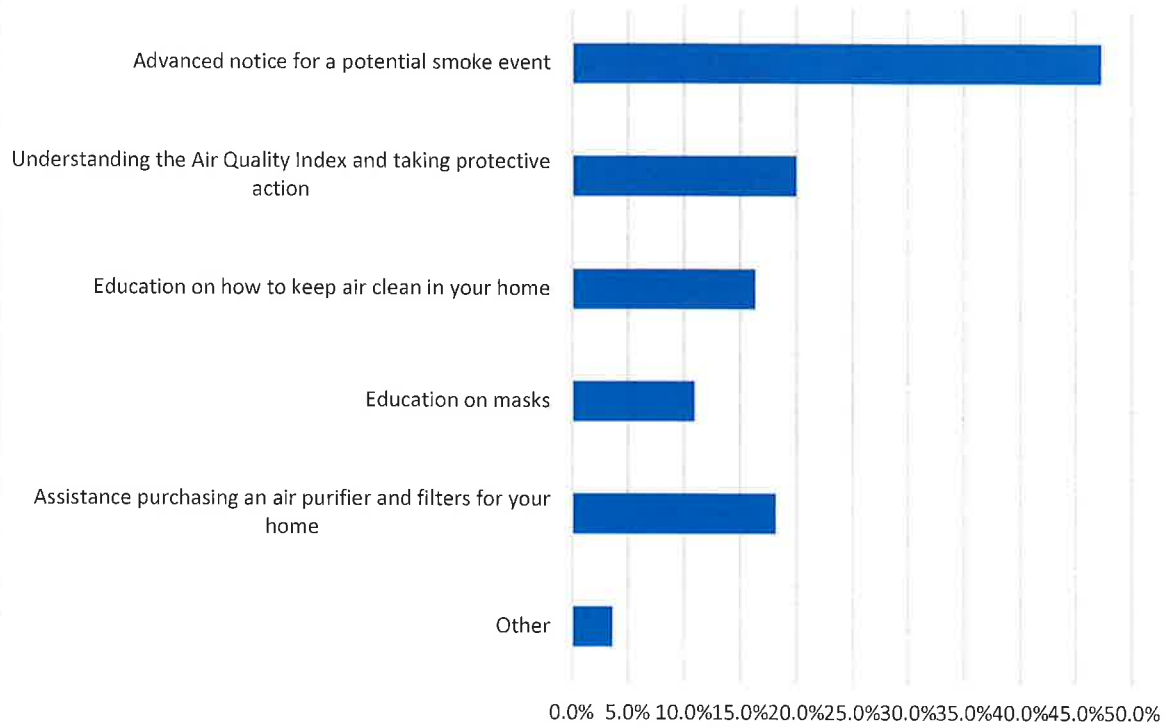
	Answer Choices	Responses	
Q4	Does anyone in your household have respiratory issues (COPD, Asthma, Smoke Allergies), cardiovascular issues or other conditions that make them vulnerable to smoke exposure? People with these conditions may be at highest risk from smoke.		
	Yes	30.9%	17
	No	69.1%	38
Total		100%	55

Q6. How does your household protect themselves from a heavy smoke event (check all that apply)?



	Answer Choices	Responses	
Q6	How does your household protect themselves from a heavy smoke event (check all that apply)?		
	Stay indoors	78.2%	43
	Leave the area for somewhere with cleaner air quality	20.0%	11
	Reduce the amount of time spent outside	80.0%	44
	Close windows	74.5%	41
	Run an air purifier or fan with filter	10.9%	6
	Run the air conditioner/HVAC, but keep the fresh air intake closed	18.2%	10
	Reduce other sources of indoor air pollution such as smoke from tobacco, wood burning stoves and burning candles	14.5%	8
	Pay attention to local air quality reports	43.6%	24
	Wear a properly fitted respirator (such as an N95 mask)	5.5%	3
	Other (please specify)	1.8%	1
Total	Responses		191

**Q8. What needs do you have to prepare for or during a smoke event (please select all that apply)?**



	Answer Choices	Responses	
Q8	What needs do you have to prepare for or during a smoke event (please select all that apply)?		
	Advanced notice for a potential smoke event	47.3%	26
	Understanding the Air Quality Index and taking protective action	20.0%	11
	Education on how to keep air clean in your home	16.4%	9
	Education on masks	10.9%	6
	Assistance purchasing an air purifier and filters for your home	18.2%	10
	Other (please specify)	3.6%	2
Total	Responses		64

**SOUTH CENTRAL OREGON FIRE MANAGEMENT PARTNERSHIP &  
LAKEVIEW INTERAGENCY FIRE CENTER**

1301 South G St.  
Lakeview, OR 97630



## News Release

March 15, 2021

Media Contact: David N. Duncan

David.n.duncan@usda.gov

541-219-0515

<http://facebook.com/scofmpfireinfo>

### Prescribed Fire Season starting in South Central Oregon

*LAKEVIEW, ORE.* – Prescribed fire season has arrived in South Central Oregon, and fire managers on the Fremont-Winema National Forest, and Lakeview District Bureau of Land Management, will be applying prescribed fire to the landscape.

Prescribed fire is used by fire managers to improve forest health and wildlife habitat, and to reduce hazardous fuels to minimize the threat of high-intensity, severe wildfires in our area. Applying prescribed fire is a part of our continued commitment to protecting communities and natural resources from wildfires.

Warmer temperatures, reduced snowpack, adequate humidity, and favorable winds are improving the conditions needed for firefighters to start applying fire to planned units.

Area residents and visitors may notice smoke or fire on public lands in various areas during the next few months. Each prescribed fire can appear different visually depending on the forest type, fuel load, prescribed fire objectives, and how long fire has been absent from the area. Areas, where prescribed fire operations are taking place, will be well signed and may have increased fire personnel, traffic, and smoke in the area. Please stay clear of these areas when possible for public and firefighter safety.

Prescribed fire occurs on days when the Oregon Department of Forestry Smoke Management Office indicates there are suitable weather conditions for smoke dispersal. Following that approval, if overall fuel and weather conditions are favorable, firefighters ignite a test fire before moving forward with the prescribed fire. If the test-fire indicates conditions are not suitable, the prescribed fire will be postponed until conditions improve. All burning operations are monitored and patrolled frequently by fire professionals, to ensure public safety.

All South-Central Oregon Fire Management Partnership employees are committed to a safe and successful prescribed fire season for the public and employees within these designated areas.

For more information and current updates, check online at Facebook at [facebook.com/SCOFMPFireInfo](https://www.facebook.com/SCOFMPFireInfo)

###

*South Central Oregon Fire Management Partnership provides comprehensive wildland fire services to more than eight million acres of land administered by the Bureau of Land Management Lakeview District; Fremont-Winema National Forest; Oregon Department of Forestry Klamath-Lake District; U.S. Fish and Wildlife Service's Sheldon-Hart Mountain National Wildlife Refuge Complex; and Crater Lake National Park. The area encompasses federal, state, and private lands within south central Oregon and northwest Nevada.*

**Lakeview Ranger District:**

Information: 541-947-3334

<b>Name:</b>	<b>Size (Acres):</b>	<b>Location from Lakeview, OR</b>
Strawberry / Stateline	11,000	25 miles southwest of Lakeview from Yocum Valley to Strawberry Butte
Crooked Mud Honey	500	12 miles northeast of Lakeview in the Drakes Peak and Vee Lake area.
West Drews	1,000	23 miles west of Lakeview and 6 miles west of Drews Reservoir

**Winter Rim Zone:**

Information: 541-943-4424

Information: 541-576-7524

<b>Name:</b>	<b>Size (Acres):</b>	<b>Location from Paisley or Silver Lake, OR</b>
Coyote	1,300	19 miles southwest of Silver Lake. West of Sycan Marsh
Ben Young	3,800	13 miles south of Paisley. Parker Hills
Bridge Buck	50	13 miles southwest of Silver Lake. Rodman Rock

**BLM – Lakeview District****Lakeview Field Office:**

Information: 541-947-2177

<b>Name:</b>	<b>Size (Acres):</b>	<b>Location from Lakeview, OR</b>
Clover Flat	500	3 miles west of Valley Falls. Clover Flat Rd.
Warner Wetlands	850	5 miles northeast of Plush

**Klamath Falls Field Office:**

Information: 541-883-6916

<b>Name:</b>	<b>Size (Acres):</b>	<b>Location from Klamath Falls, OR</b>
Bryant Mountain	200	20 miles southeast of Klamath Falls 3 miles east of Malin

1301 South G St.  
Lakeview, OR 97630



## News Release

### FOR IMMEDIATE RELEASE

March 10, 2020

Media Contact: Lisa McNee

lmcnee@blm.gov

<http://facebook.com/scofmpfireinfo>

### Stateline Prescribed Fire

*LAKEVIEW, ORE.* – The Lakeview Ranger District, USFS, plans to conduct prescribed fire operations starting in the spring when weather and fuel conditions permit. The project could take up to two weeks.

The Stateline prescribed fire activities will focus on underburning inside the Stateline Prescribed Fire Project Area. Fire managers plan to burn approximately 15,000 acres to reduce fuel loading to minimize extreme fire behavior.

This will be a second or third entry maintenance burns for all the units. The area last burned in 2007. The project will be broken into smaller units that will be scheduled to be burned on days that will help to allow smoke to disperse away from developed areas and ventilate quicker, reducing the impacts to local communities.

Area residents can expect to see and hear a helicopter in the area, as aerial ignitions will occur on portions of the burn. Smoke will be visible from roadways and recreation areas in the general vicinity of this project.

Frequent, low-intensity fire removes accumulated smaller fuels and recycles nutrients in the soils to promote healthy vegetation and wildlife habitat. A healthier forest is a safer forest for firefighters and residents when wildfires inevitably occur.

For more information and current updates, check online at Facebook at [facebook.com/SCOFMPFireInfo](https://www.facebook.com/SCOFMPFireInfo)

###

*South Central Oregon Fire Management Partnership provides comprehensive wildland fire services to more than eight million acres of land administered by the Bureau of Land Management Lakeview District; Fremont-Winema National Forest; Oregon Department of Forestry Klamath-Lake District; U.S. Fish and Wildlife Service's Sheldon-Hart Mountain National Wildlife Refuge Complex; and Crater Lake National Park. The area encompasses federal, state and private lands within south central Oregon and northwest Nevada.*

# Prescribed burning and smoke management

REDUCING WILDFIRE  
RISK. MINIMIZING SMOKE  
IN COMMUNITIES

To learn more about... prescribed  
burning and smoke management

## VISIT

[https://www.oregon.gov/ODF/Fire/Pages/  
Burn.aspx](https://www.oregon.gov/ODF/Fire/Pages/Burn.aspx)

## or CALL

503-945-7451



STEWARDSHIP IN FORESTRY

Oregon Department of Forestry  
Fire Protection program  
2600 State St., Salem, OR 97310

Revised 05-15-2019

# Oregon Department of Forestry

**Promoting and practicing  
sustainable forestry**

## APPENDIX G: HEPA DISTRIBUTION DAY DOCUMENTS

### FREE HEPA DISTRIBUTION DAY

Lake County and the Town of Lakeview secured a grant from the Oregon Department of Environmental Quality to protect our most vulnerable citizens from the effects of smoke by supplying free HEPA-grade room air purifiers and replacement filters to those who qualify. Community organizations will be hosting a HEPA Distribution Day on Wednesday April 28, 2021 from 3pm-8pm at the Lake County Fairgrounds 1900 N 4<sup>th</sup> Street, Lakeview, OR 97630.

Due to high demand for air purifiers and a limited supply, applicants will be qualified based on the following criteria:

- 1) Must live in the Town of Lakeview
- 2) Age vulnerability to include children under 15 and residents over 65
- 3) Citizens predisposed by heart or lung problems including asthma and COPD
- 4) Must sign up for Alert Sense messaging (so that we can communicate with you about optimal times to use your free HEPA filter)

**\*\*Limit one per household**

Standalone HEPA purifiers are easy to operate, do not require modifications to existing heating or air conditioning, and provide a high level of air filtration and protection.



State of Oregon  
Department of  
Environmental  
Quality



<p>Through our already-existing network of partners and established contacts, such as SCOFMP, as well as with new partners and contacts, we will seek new input and review the Community Response Plan once each year.</p>	<p>Lake County Public Health/ Independent contractor?</p>	<p>Annually (March)</p>	<p>Review completed with any pertinent updates made to the CRP</p>	<p>Grant?/Title 3?</p>
<p>Report annually to ODF and DEQ on implementation of the Lakeview SSRA CRP. In this report we will document continued compliance with the 4 required components of the Lakeview SSRA CRP outline in the document, as well as a summary of methods used to communicate to the public and smoke-vulnerable populations, a log of dates and times the CRP is initiated (specifically emergency notification has been made), and a record of local meetings to discuss or update the CRP.</p>	<p>Lake County Public Health/ Town of Lakeview</p>	<p>Annually (March)</p>	<p>Annual report to DEQ completed in conjunction with Lake County Health and Human Services.</p>	<p>Grant?/Title 3?</p>

<p>Press releases disseminated by local, state, and federal partners to the public through local media (newspaper and radio)</p>	<p>USFS/ SCOFMP/ODF/KLFHP/Lake County/Town of Lakeview</p>	<p>Ongoing</p>	<p>Public Awareness achieved</p>	<p>Internal to agencies</p>	
<p>Online and social media channels, partner organization websites, newsfeeds, Twitter, and Facebook</p>	<p>USFS/ SCOFMP/ODF/KLFHP/Lake County/Town of Lakeview</p>	<p>Ongoing</p>	<p>Public Awareness achieved</p>	<p>Internal to agencies</p>	
<p>Continued opportunity for residents to be a part of the HEPA distribution program</p>	<p>Lake County Public Health</p>	<p>Ongoing (until supplies are gone)</p>	<p>All units distributed</p>	<p>Grant</p>	
<p>Conduct an annual community-wide survey to assure that these communication methods are reaching the intended audiences and providing information that is relevant to the public. This survey will capture information on where the participants turn for information about fire, smoke, and public health, as well as resources that they feel are lacking, and feedback on how to improve communication. Annual survey results will be used to continually improve the program and inform outreach in the community each year.</p>	<p>Lake County Public Health/ Independent contractor?</p>	<p>Annually</p>	<p>Improved outreach within the community</p>	<p>Grant?/Title 3?</p>	

APPENDIX J: LAKEVIEW CRP PARTNER LIST AND IMPLEMENTATION ASSIGNMENTS

Organization	Position within Organization	Phone #
Department of Environmental Quality	Air Quality Planner	503-229-5696
Lake Chamber of Commerce	Chamber Director	541-947-6040
Lake Community Partnership	Executive Director	541-947-6040
Lake County	Lake County Commissioner	541-947-6005
Lake County Public Health	Registered Nurse	541-947-6045
Lake County Sheriff's Department	Lake County Sheriff	541-947-6027
Lake County School District #7	Superintendent	541-947-3347
Lake County Resource Initiative	Executive Director	541-947-5461
Oregon Department of Forestry	Lakeview Protection Unit Forester	541-947-3311
Oregon Department of Forestry	Smoke Management Manager	503-945-7451
Town of Lakeview	Town Manager	541-947-2029
Town of Lakeview	Mayor	541-947-2029
USFS-Fremont Winema NF	Lakeview Ranger District FMO	541-947-6370
USFS-Fremont Winema NF	Fire Information Officer	541-947-6226
USFS-Fremont Winema NF	Cohesive Strategy Coordinator	541-947-6256
USFS/BLM	Fuels Staff Officer	541-947-6269



by all properly authorized, signatory officials, prior to any changes being performed. Requests for modification should be made, in writing, at least 30 days prior to implementation of the requested change.

O. COMMENCEMENT/EXPIRATION DATE. This MOU is executed as of the date of the last signature and is effective through **September 15, 2024** at which time it will expire, unless extended by an executed modification, signed and dated by all properly authorized, signatory officials.

P. AUTHORIZED REPRESENTATIVES. By signature below, each party certifies that the individuals listed in this document as representatives of the individual parties are authorized to act in their respective areas for matters related to this MOU.

In witness whereof, the parties hereto have executed this MOU as of the last date written below.

\_\_\_\_\_  
MARK W. BAILEY, Air Quality Manager  
Oregon Department of Environmental Quality

Date

\_\_\_\_\_  
MARK ALBERTSON, County Commissioner  
Lake County

Date

\_\_\_\_\_  
JEFF MARSHALL, Town Manager (Acting)  
Town of Lakeview

9-26-19

Date

\_\_\_\_\_  
BARRY L. IMLER, Forest Supervisor  
U.S. Forest Service, Fremont-Winema National Forest

9-23-2019

Date

\_\_\_\_\_  
TODD FORBES, District Manager  
Bureau of Land Management, Lakeview District

9/24/19

Date



Management endorsement of Cooperators' products or activities.

- E. NONBINDING AGREEMENT. This MOU creates no right, benefit, or trust responsibility, substantive or procedural, enforceable by law or equity. The parties shall manage their respective resources and activities in a separate, coordinated and mutually beneficial manner to meet the purpose(s) of this MOU. Nothing in this MOU authorizes any of the parties to obligate or transfer anything of value.

Specific, prospective projects or activities that involve the transfer of funds, services, property, and/or anything of value to a party requires the execution of separate agreements and are contingent upon numerous factors, including, as applicable, but not limited to: agency availability of appropriated funds and other resources; Cooperator availability of funds and other resources; agency and Cooperator administrative and legal requirements (including agency authorization by statute); etc. This MOU neither provides, nor meets these criteria. If the parties elect to enter into an obligation agreement that involves the transfer of funds, services, property, and/or anything of value to a party, then the applicable criteria must be met. Additionally, under a prospective agreement, each party operates under its own laws, regulations, and/or policies, and any Forest Service or Bureau of Land Management obligation is subject to the availability of appropriated funds and other resources. The negotiation, execution, and administration of these prospective agreements must comply with all applicable law

Nothing in this MOU is intended to alter, limit, or expand the agencies' statutory and regulatory authority.

- F. USE OF U.S. FOREST SERVICE AND BUREAU OF LAND MANAGEMENT INSIGNIA. In order for Cooperators to use the U.S. Forest Service and Bureau of Land Management insignia on any published media, such as a Web page, printed publication, or audiovisual production, permission must be granted from the U.S. Forest Service and Bureau of Land Management's Office of Communications. A written request must be submitted and approval granted in writing by the Office of Communications (Washington Office) prior to use of the insignia.
- G. MEMBERS OF U.S. CONGRESS. Pursuant to 41 U.S.C. 22, no U.S. member of, or U.S. delegate to, Congress shall be admitted to any share or part of this agreement, or benefits that may arise therefrom, either directly or indirectly.
- H. FREEDOM OF INFORMATION ACT (FOIA). Public access to MOU or agreement records must not be limited, except when such records must be kept confidential and would have been exempted from disclosure pursuant to Freedom of Information regulations (5 U.S.C. 552).
- I. TEXT MESSAGING WHILE DRIVING. In accordance with Executive Order (EO) 13513, "Federal Leadership on Reducing Text Messaging While Driving," any and all text messaging by Federal employees is banned: a) while driving a Government owned vehicle (GOV) or driving a privately owned vehicle (POV) while on official Government



- D. Other LFSMA Requirements: No burning is allowed on Red Woodstove Advisory Days issued by the Town of Lakeview. Burning should be avoided on Yellow Woodstove Advisory Days, however, based on the Federal Fire Manager’s assessment that no significant smoke impact will occur within the LFSMA and concurrence from ODF Smoke Management, federal managers may decide to ignite on a Yellow Woodstove Advisory Day. Burning is allowed on Green Woodstove Advisory Days, but also requires an assessment by the Federal Managers that no significant smoke impact will occur within the LFSMA.
  
- E. Other LFSMA Requirements: On Yellow Woodstove Advisory Days and Green Woodstove Advisory Days, no prescribed burning will be conducted if it is expected the burn will produce significant smoke after the third day that may lead to a smoke intrusion. Landowners are responsible for intermittent monitoring for at least three days following ignition to ensure the smoke is not causing an impact to Lakeview. The U.S. Forest Service and Bureau of Land Management can waive this provision if it believes that monitoring is unnecessary on a specific burn unit. Any potential mop-up requirements shall be included as an element of the burn plan for units within the LFSMA.

**VII. IT IS MUTUALLY UNDERSTOOD AND AGREED BY AND BETWEEN THE PARTIES THAT:**

- A. PRINCIPAL CONTACTS. Individuals listed below are authorized to act in their respective areas for matters related to this agreement.

**Principal Cooperator Contacts:**

<b>DEQ Program Contact</b>	<b>DEQ Administrative Contact</b>
Mark Bailey Air Quality Manager 475 NE Bellevue, Suite 110 Bend, OR 97701 Telephone: 541-633-2006 FAX: 541-388-8283 Email: <a href="mailto:bailey.mark@deq.state.or.us">bailey.mark@deq.state.or.us</a>	Peter Brewer Air Quality Specialist 475 NE Bellevue, Suite 110 Bend, OR, 97701 Telephone: 541-633-2004 Mobile: 503-752-9374 Email: <a href="mailto:peter.brewer@state.or.us">peter.brewer@state.or.us</a>

<b>Lake County Program Contact</b>	<b>Lake County Administrative Contact</b>
Mark Albertson Lake County Commissioner 513 Center Street Lakeview, OR 97630 Telephone: 541-947-6004 FAX: 541-947-5775 Email: <a href="mailto:malbertson@co.lake.us">malbertson@co.lake.us</a>	Melanie Boozenny Administrative Assistant 513 Center Street Lakeview, OR 97630 Telephone: 541-947-6003 FAX: 541-947-5775 Email: <a href="mailto:mboozenny@co.lake.or.us">mboozenny@co.lake.or.us</a>



### **III. STATEMENT OF MUTUAL BENEFIT AND INTERESTS:**

The U.S. Forest Service and Bureau of Land Management are interested in cultivating public relationships, cleaner air quality, and environmental conservation. Both agencies are also interested in reducing fuel on public lands by using prescribed fire to improve landscapes, which reduces the buildup of fuels contributing to high intensity and high severity fires. By decreasing air pollution, the U.S. Forest Service and Bureau of Land Management benefit from complying with the Clean Air Act, improving public health and safety, and conserving the environment for future generations.

The Town of Lakeview and Lake County are interested in public safety and health and a clean livable environment. Citizens, both in Lakeview and nearby, actively engage in controlling emissions, which avoids creating air pollution on low air quality days. The Town of Lakeview and Lake County benefit when their citizens are healthy and not impacted by unnecessary smoke exposure. Likewise, local businesses thrive when residents can be outside and partake in commerce, which in turn, boosts the economy.

DEQ's mission is to be a leader in restoring, maintaining, and enhancing the quality of Oregon's air, land, and water. DEQ is interested in clean air and protecting public health throughout Oregon and particularly in near nonattainment areas, such as Lakeview. When air pollution is reduced, DEQ benefits because air quality is restored, maintained, and enhanced, and public health is preserved, which fulfills their mission.

By all parties working together, the U.S. Forest Service and Bureau of Land Management can still achieve fuels reductions on federal lands while collaborating with the Cooperators to ensure burning is conducted on days least affecting citizens within the LFSMA. In effect, the DEQ's goal of improving air quality in Lakeview will be attainable during this designated timeframe. Each agency mutually benefits from clean air in the Lakeview area when residents' quality of health is improved, partnerships are strengthened between all agencies, and environmental conservation is protected.

In consideration of the above premises, the parties agree as follows:

### **IV. OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY SHALL:**

- A. Monitor the air quality in Lakeview and provide the data through their website:  
<https://oraqi.deq.state.or.us/home/map>
- B. Facilitate planning and the actions associated with pollution prevention in Lakeview.
- C. Coordinate with the Town of Lakeview, Lake County, the U.S. Forest Service, and Bureau of Land Management, when necessary, to help implement this agreement, in accordance with the Oregon Department of Forestry (ODF) Oregon Smoke Management Plan.

### **V. TOWN OF LAKEVIEW IN COORDINATION WITH LAKE COUNTY SHALL:**

# APPENDIX I: LAKEVIEW AREA SMOKE MANAGEMENT MOU



FS Agreement No. 19-MU-11060200-033

BLM Agreement No. BLM-ORL001908

**MEMORANDUM OF UNDERSTANDING**  
**Between The**  
**OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY,**  
**LAKE COUNTY,**  
**TOWN OF LAKEVIEW**  
**And The**  
**USDA, FOREST SERVICE**  
**FREMONT-WINEMA NATIONAL FOREST**  
**And The**  
**USDI, BUREAU OF LAND MANAGEMENT**  
**LAKEVIEW DISTRICT**

This MEMORANDUM OF UNDERSTANDING (MOU) is hereby made and entered into by and between the Oregon Department of Environmental Quality (DEQ), Lake County, and the Town of Lakeview, hereinafter referred to as collectively as “Cooperators,” and the USDA, Forest Service, Fremont-Winema National Forest hereinafter referred to as the “U.S. Forest Service” and the USDI, Bureau of Land Management Lakeview District, hereinafter referred to as the “Bureau of Land Management.”

Background: Since 2014, local and federal agencies have worked together to minimize smoke impacts on the Lakeview community. The objective of this MOU is to protect the air quality in the Lakeview area, which is currently in jeopardy of violating the 24-hour National Ambient Air Quality Standard (NAAQS) for fine particulate matter or PM<sub>2.5</sub>. This MOU has been designed and has been successful in maximizing opportunities for accomplishing burning on federal lands while minimizing the likelihood of public health effects to the Lakeview community during the time period of November 1<sup>th</sup> through February 28<sup>th</sup>. The MOU has reduced the potential of a Smoke Incident as defined in OAR 629-048-0005 or Smoke Intrusion as defined in OAR 629-048-0005(27).

Title: Lakeview Area Smoke Management

- I. PURPOSE:** The purpose of this MOU is to document the cooperation between the parties to avoid or minimize any smoke impacts in the Lakeview Forest Smoke Management Area (LFSMA) caused by forest burning, in accordance with the following provisions.
  
- II. MAP:** The following map shows the LFSMA from Thomas Creek to the crest of the Warners to the Oregon-California line to the ridgeline on the west side of Goose Lake Valley also known as the PM Advance Project Area or the Goose Valley Airshed Boundary.

(c) Oregon Certified Wood Stoves: An exemption may be issued to the heads of households for the operation of an Oregon Certified Wood Stove in a Residence during a Yellow Day Air Quality Advisory. However, the availability of this exemption is strictly contingent upon the Oregon Certified Wood Stove producing no visible smoke. The operation of an Oregon Certified Wood Stove shall be prohibited during a Red Day Air Quality Advisory, unless some other applicable exemption has been granted.

#### SECTION 4. INSTALLATION OF FIREPLACES AND WOODSTOVES:

For the installation of solid fuel burning device in new construction requires an alternative heat source within the Lakeview Urban Growth Boundary. In addition, any solid fuel burning device installed into an existing commercial facility or dwelling or in newly constructed facilities or dwellings, the device must be certified and meet certain emission requirements within the Lakeview Urban Growth Boundary.

(a) For newly constructed single family dwellings or multiple family dwellings, an additional alternative heat source, sufficient for home heating, is required should a solid fuel burning device be installed in the same dwelling. The home heating system must be fueled by propane, diesel, or other similar fuel, geothermal, or electric device with enough capacity to heat the dwelling from minus ten degrees Fahrenheit at ambient temperature to 68 degrees Fahrenheit; and

(b) A solid fuel burning device being installed in any single family dwelling, commercial facility or multiple family dwelling must meet certain emission requirements. Wood stoves must be certified and meet a 2.0 grams per hour emission limitation or current federal EPA NSPS standards for wood stoves whichever is less. Any newly constructed fireplaces must comply with fireplace ASTM standards. Any retrofitted fireplace must meet fireplace ASTM standards. Fireplaces must use the ASTM international standard test method E2558, and meet 5.1 grams per kilogram specifications.

#### SECTION 5. ENFORCEMENT AND PENALTIES:

Any violation of this Ordinance or non-compliance with any of the provisions hereof shall be subject to legal proceedings to abate or enjoin such violation for non-compliance.

In addition to or in lieu of abatement or injunctive proceedings, any violation of this Ordinance may be commenced by the issuance of a citation and shall be prosecuted in the Lake County Circuit Court as a Class B Violation pursuant to the provisions of ORS 153.008, ORS 153.012 and ORS 153.018 as now in effect or as may be amended from time to time.

The Town's Manager, or his designee, will have the primary responsibility of surveying the community for non-compliance and issuing warning letters. The Town's Chief of Police, or his designee, will have primary responsibility for the formal enforcement of the regulations as contained in the first paragraph of this Section and the remainder of this Ordinance.

#### SECTION 6. SEVERABILITY:

If any section, subsection, sentence or clause, or any portion of this Ordinance is, for any reason, held invalid or unconstitutional by a court of competent jurisdiction, such portion shall be deemed a separate, distinct and independent provision and shall not affect the validity of the remaining portion thereof.

BEFORE THE BOARD OF COUNTY COMMISSIONERS  
FOR LAKE COUNTY, OREGON

In the Matter of Prohibiting the Use of Solid Fuel     )  
Burning devices; Providing Certain Exemptions     )     ORDINANCE  
And Establishing Enforcement Controls     )     NO. 105  
Therefore     )

WHEREAS, the health, safety and welfare of the citizens of the Lake County are adversely affected by the deterioration air quality within the Urban Growth Boundary of the Town of Lakeview; and

WHEREAS, wood combustion for space heating produces particulate matter and other pollutants which are injurious to the public health, and are a primary cause of deteriorated air quality within the Urban Growth Boundary of the Town of Lakeview; and

WHEREAS, a mandatory wood burning curtailment ordinance is essential to comply with the provisions of the federal Clean Air Act and assure healthful air quality; now, therefore,

LAKE COUNTY ORDAINS AS FOLLOWS:

SECTION 1. DEFINITIONS:

As used in this ordinance, the following words, except where the context clearly indicates otherwise, mean:

- (a) Air Pollution Alert: a 24-hour period commencing at noon by the Town of Lakeview of a Yellow Day or Red Day Air Quality Advisory.
- (b) Air Quality Advisory: A public announcement to inform Lakeview Urban Growth Boundary residents of forecasted air quality.
- (c) Alternative Heat Source: A heat source other than a Solid Fuel Burning Device, with such heat source being capable of heating a residence in accordance with Oregon Building Code standards.
- (d) Green Day: An Air Quality Advisory provided by the Town of Lakeview which forecasts acceptable air quality for the following 24-hour period.
- (e) Yellow Day: An Air Quality Advisory provided by the Town of Lakeview which forecasts increased PM2.5 concentrations over the following 24 hour period. A Yellow Day forecast signifies that average PM2.5 concentrations are expected to reach levels of health concern, but which are not expected to approach 30  $\mu\text{g}/\text{m}^3$ .
- (f) Red Day: An Air Quality Advisory provided by the Town of Lakeview which forecasts average PM2.5 concentrations at levels which are a risk of reaching and/or exceeding 30  $\mu\text{g}/\text{m}^3$ .
- (g) Person: Any individual, partnership, corporation, company or other association.
- (h) Oregon Certified Wood Stove; A Solid Fuel Burning Device certified by the United States Environmental Protection Agency or the Oregon Department of Environmental Quality as meeting emission performance standards specified in Oregon Administrative Rules, 340, division 262, now in effect or which may be amended from time to time.

(g) Yellow Day: An Air Quality Advisory provided by the Town of Lakeview which forecasts increased PM2.5 concentrations over the following 24 hour period. A Yellow Day forecast signifies that average PM2.5 concentrations are expected to reach levels of health concern, but which are not expected to approach 30 µg/m3.

(h) Red Day: An Air Quality Advisory provided by the Town of Lakeview which forecasts average PM2.5 concentrations at levels which are at risk of reaching and/or exceeding 30 µg/m3.

**SECTION 3. BURNING OF WASTE:** The burning of waste at any time, whether by open burning or in a solid fuel burning device, as defined herein, is prohibited within the Urban Growth Boundary of the Town of Lakeview.

**SECTION 4. RESTRICTIONS ON OPEN BURNING:** All open burning is absolutely prohibited within the Urban Growth Boundary of the Town of Lakeview from and including November 1<sup>st</sup> through the end of February of the following year. Open burning which is not prohibited by the terms of this ordinance, may be permitted if a permit for the same has been obtained by the Lakeview Fire Department within the Urban Growth Boundary of the Town of Lakeview (see Section 5).

**SECTION 5. OPEN BURNING PERMITS:** An open burning permit shall only be issued for a Green Advisory Day. A permit shall only be used on the day that it is issued and all open burning shall be completed prior to 5:00 p.m. The Fire Chief of the Town of Lakeview or his designee is hereby authorized to issue such permits to residents of the Town of Lakeview and the surrounding Urban Growth Boundary subject to such reasonable terms and conditions as the Fire Chief or designee, in their sole discretion, shall deem advisable for the protection of the residents of the Town of Lakeview and surrounding Urban Growth Boundary. The terms and conditions of all open burning permits issued shall be subject to those burning conditions as set forth in Section 6 below. The issuance of a permit imposes no liability on the Town of Lakeview for any damage caused by open burning and the sole risk thereof lies with the person obtaining the permit.

**SECTION 6. CONDITIONS OF OPEN BURNING PERMIT:** Any open burning permit issued pursuant to Section 5 above, whether such permit is issued orally or in written form, shall be subject to the following conditions:

- (a) Waste may not be burned.
- (b) Open burning piles shall not exceed 6 feet in diameter and 4 feet in height, shall have a 6 foot clearance around the pile and shall not be closer than 20 feet from any combustible material.
- (c) Permits will be issued on green days only.
- (d) Open burning must be continuously attended by an adult 18 years of age or older who has immediate access to a pressurized hose.
- (e) All open burning must be commenced and completed between the hours of 8:00 a.m. and 5:00 p.m. on the date the permit is issued.

**SECTION 7. ABATEMENT, ENFORCEMENT, AND PENALTIES:** Any violation of this ordinance or non-compliance with any of the provisions hereof shall be subject to legal proceedings to abate or enjoin such violation for non-compliance.

In addition to or in lieu of abatement or injunctive proceedings, any violation of this ordinance may be commenced by the issuance of a citation and shall be prosecuted in the Lake County Circuit Court as a Class B Violation pursuant to the provisions of ORS 153.008, ORS 153.012 and ORS 153.018 as now in effect or as may be amended from time to time.

The Town of Lakeview Fire Chief, or his designee, will have primary responsibility for the enforcement of the regulations as contained in this ordinance.

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BEFORE THE BOARD OF COMMISSIONERS  
FOR THE COUNTY OF LAKE


In the Matter of a Resolution )  
To Repeal Ordinance No. 30 ) Resolution No. 14-09-03B  
Prohibiting the Burning of Waste and )  
Restricting Open Burning )

WHEREAS, the Lake County Board of Commissioners feel that given Ordinance No. 30 will be superseded by new Ordinance #106, the Board hereby ordains that Ordinance No. 30 is repealed.

DATED this 2 day of Sept., 2014.

  
\_\_\_\_\_  
Dan Shoun, Chair

  
\_\_\_\_\_  
Bradley J. Winters, Vice-Chair

  
\_\_\_\_\_  
Ken Kestner, Commissioner

# Appendix F: Ordinance Revisions

Lakeview Oregon:

Placeholder for Open Burn Ordinance and Woodstove Curtailment Ordinance within City Limits

by the PM 2.5 FRM (Federal Reference Method). Unfortunately, DEQ did not have available resources to conduct a SANDWICH method.

**3. Source Apportionment:**

However, EPA conducted a source apportionment method on the speciation data and determined that a large contribution was related to wood smoke. Based on the Annual Average PM2.5, EPA found that the Positive Matrix Factorization (PMF) apportionment for the annual average data in Lakeview was as follows.

Annual average PM2.5 (mg m<sup>-3</sup>) and source apportionment results for PMF factors found at Chemical Speciation Network (CSN) monitoring sites Oregon.<sup>10</sup>

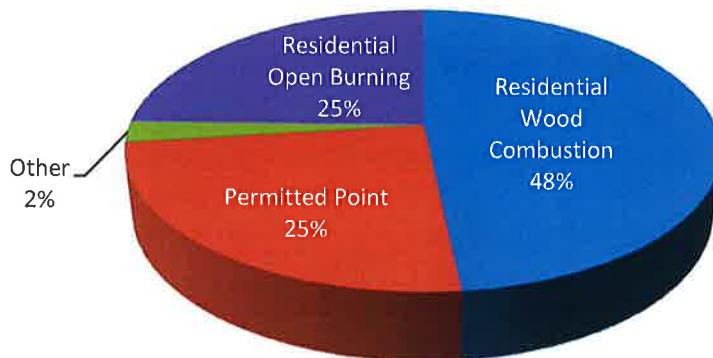
Site name	Number of factors found	Measured average PM2.5	Nitrate rich	Organic pyrolysis (OP) rich	Potassium rich	Soil	Sulfur rich	Urban unidentified	Wood smoke
Lakeview	7	8.5	0.7	1.4	0.6	0.9	0.4	0.5	4.2

**4. Emission Inventory:**

Comparing the various methods to an emission inventory, DEQ found the following results:

Annual Emissions in the Urban Growth Boundary (UGB) for the base year (See map in Action Plan – Figure 3)

**Annual tons/year**



The Design Day that represents the 98%ile day is weighted toward a winter day when it is likely to have poor ventilation and poor air quality.

The Design Day UGB emissions for the base year are as follows:

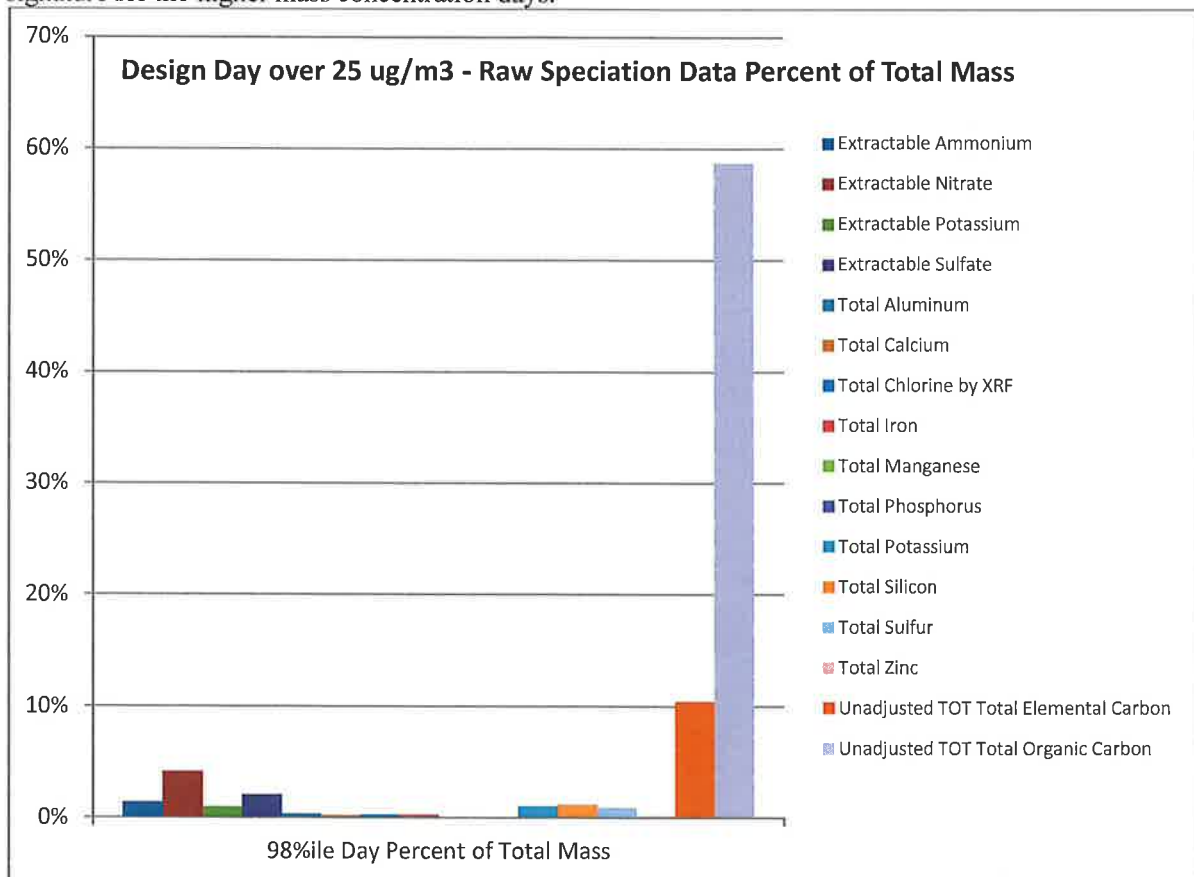
<sup>10</sup> Robert A. Kotchenruther, 2012, Table 3 – Atmospheric Environment, journal homepage: [www.elsevier.com/locate/atmosenv](http://www.elsevier.com/locate/atmosenv), 68 (2013) 103e111, A regional assessment of marine vessel PM2.5 impacts in the U.S. Pacific Northwest using a receptor-based source apportionment method. (Kotchenruther, U.S. Environmental Protection Agency Region 10, Office of Environmental Assessment, 1200 Sixth Avenue, Suite 900, OEA-095, Seattle, WA 98101, USA).

# Appendix E: Speciation Data

Speciation of Data in Lakeview Oregon:

## 1. Raw Data:

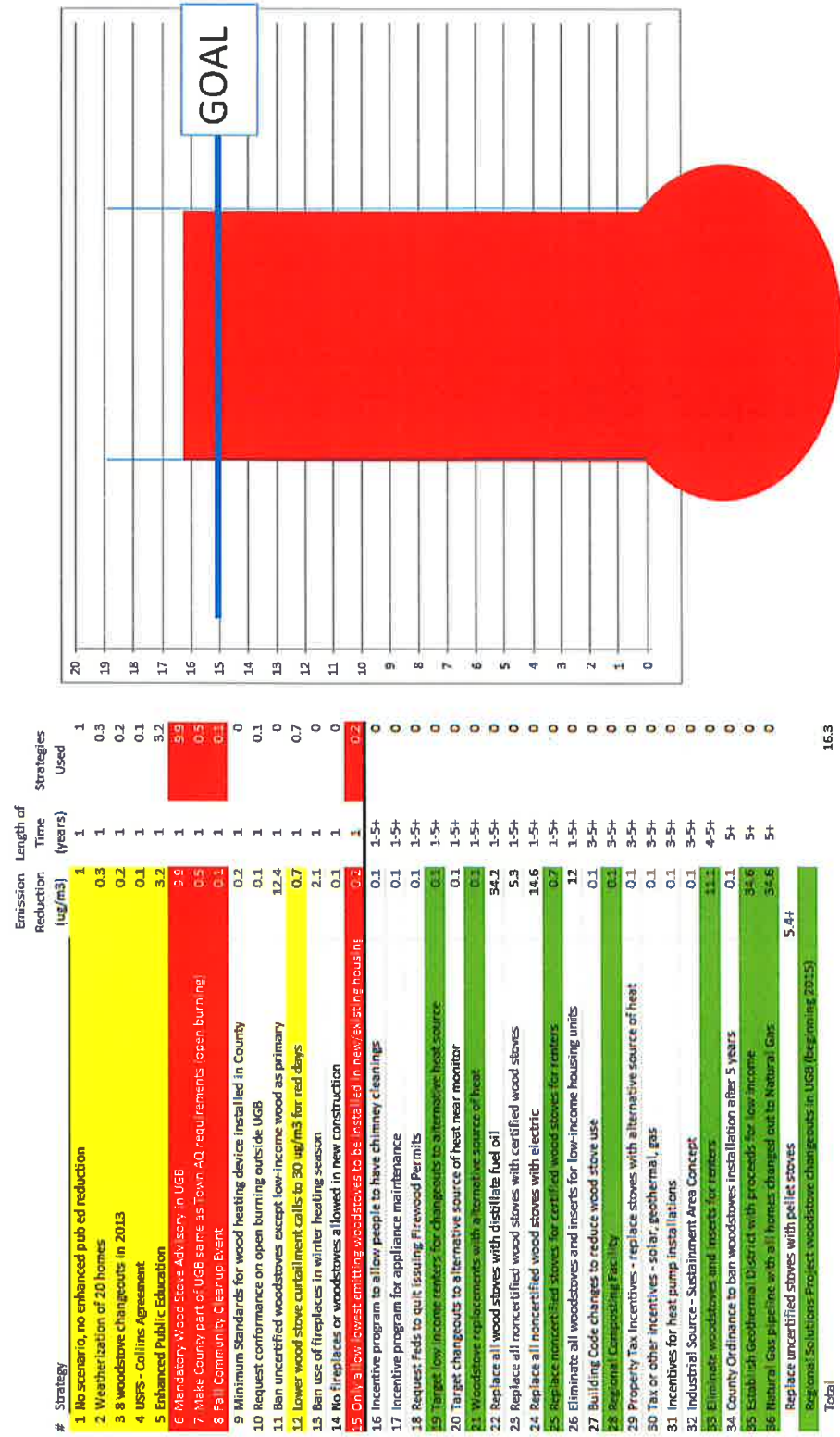
Below are charts showing the raw data in percent of total mass of the filter sample by chemical species. DEQ selected all data with mass over 25 micrograms per cubic meter that could represent an exceedance day or a day of potential exceedance to determine the percent of each chemical species that is consistent with a strong smoke signature for the higher mass concentration days.



Total + Background	45.2	43.0	37.6	28.2	33.0	42.9	42.8	40.8	30.5	8.1	8.5	42.5	31.8	42.3	30.8	42.2	42.7	42.6	42.1
Net reduction from Strategy no 6%	1.8	4.0	9.4	18.8	14.0	4.1	4.2	6.2	16.5	38.9	38.5	4.5	15.2	4.7	16.2	4.8	4.3	4.4	4.9
Net reduction from Strategy no 6%	1.8	4.0	5.4	14.8	10.0	0.0	0.2	2.1	12.5	34.9	34.5	0.5	11.2	0.7	12.1	0.7	0.2	0.4	0.9
Reduction as % of DV	3.8%	8.5%	#####	#####	#####	0.1%	0.5%	4.6%	#####	74.2%	73.4%	1.1%	#####	1.4%	#####	1.6%	0.5%	0.8%	1.9%

Assumed Reductions in 2019 (ug/m3)				
	Increased Public Education	Mandatory WS Curtailment + 30ug/m3 trigger	Weatherization of Homes	No Open Burning in UGB during Heating Season
Rollback Scenarios:	D20	D23 +D32	D34	D35 D34
Component Reductions	4.0	10.0 0.7	0.4	0.9 0.4
<b>Total Reductions</b>	<b>4.0</b>	<b>10.7</b>	<b>0.4</b>	<b>0.5</b>

# Appendix C – Rollback Model



Yellow = Planned activities already implemented  
 Red = Planned activities based on ordinance revisions or proposed activity  
 Green = Proposed or potential future activities  
 Uncolored = Ideas considered but not recommended at this time

**PRINCIPAL CONTACTS.** Individuals listed below are authorized to act in their respective areas for matters related to this agreement.

**Principal Cooperators' Contacts:**

<p align="center"><b>Cooperators' Program Contact</b></p> <p>Mark W. Bailey, DEQ Eastern Region Air Quality Program Administrator 475 NE Bellevue, Suite 110 Bend, OR 97701 541-633-2006 FAX: 541-388-8283 <a href="mailto:bailey.mark@deq.state.or.us">bailey.mark@deq.state.or.us</a></p>	<p align="center"><b>Cooperators' Administrative Contact</b></p> <p>Larry Calkins, DEQ Air Quality Specialist 700 SE Emigrant Ave Suite 330 Pendleton, OR 97801 541-278-4612 FAX: 541-278-0168 <a href="mailto:calkins.larry@deq.state.or.us">calkins.larry@deq.state.or.us</a></p>
<p align="center"><b>Cooperators' Program Contact</b></p> <p>Ken Kestner, Lake County Commissioner Chairperson 513 Center Street Lakeview, OR 97630 541-947-6004 FAX: 541-947-5775 <a href="mailto:kkestner@co.lake.or.us">kkestner@co.lake.or.us</a></p>	<p align="center"><b>Cooperators' Administrative Contact</b></p> <p>Denise Thorsted, Administrative Assistant 513 Center Street Lakeview, OR 97630 541-947-6003 FAX: 541-947-5775 <a href="mailto:dthorsted@co.lake.or.us">dthorsted@co.lake.or.us</a></p>
<p align="center"><b>Cooperators' Program Contact</b></p> <p>Mike Patrick, Town of Lakeview Mayor 525 N. First Street Lakeview, OR 97630 541-947-2029 <a href="mailto:lakeviewmayor@yahoo.com">lakeviewmayor@yahoo.com</a></p>	<p align="center"><b>Cooperators' Administrative Contact</b></p> <p>Ray Simms, Lakeview Town Manager 525 N. First Street Lakeview, OR 97630 541-947-2029 <a href="mailto:lakeviewtownmanager@yahoo.com">lakeviewtownmanager@yahoo.com</a></p>
<p align="center"><b>Cooperators' Program Contact</b></p> <p>Greg Pittman, District Forester ODF 2290 North 4<sup>th</sup> Street Lakeview, OR 97360 541-947-3311 541-947-3078 <a href="mailto:gpittman@opd.state.or.us">gpittman@opd.state.or.us</a></p>	<p align="center"><b>Cooperators' Administrative Contact</b></p> <p>Dustin Gustaveson, Unit Forester ODF 2290 North 4<sup>th</sup> Street Lakeview, OR 97360 541-947-3311 541-947-3078 <a href="mailto:dgustaveson@odf.state.or.us">dgustaveson@odf.state.or.us</a></p>
<p align="center"><b>Cooperators' Program Contact</b></p> <p>Lee Fledderjohann, Resource Manager Collins Timber Company, LLC P.O. Box 1340 Lakeview, OR 97630 541-947-947-2018 ext 27 FAX: 541-947-2832 <a href="mailto:lfledderjohann@collinsco.com">lfledderjohann@collinsco.com</a></p>	<p align="center"><b>Cooperators' Administrative Contact</b></p> <p>Jess Brown, Environmental Manager Collins Timber Company, LLC 1618 SW First Ave, Suite 500 Portland, Oregon 97201 503-471-2250 FAX: 503-227-5349 <a href="mailto:jbrown@collinsco.com">jbrown@collinsco.com</a></p>

Lakeview. ODF can waive this provision if it believes that monitoring is unnecessary on a specific burn unit.

IT IS MUTUALLY UNDERSTOOD AND AGREED BY AND BETWEEN THE PARTIES THAT:

NOTICES. Any communications affecting the operations covered by this agreement given by Collins or Cooperators is sufficient only if in writing and delivered in person, mailed, or transmitted electronically by e-mail or fax, as follows:

- o To Collins, at the address specified in the MOU.
- o To Cooperators, at Cooperators' address shown in the MOU or such other address designated within the MOU.
  
- o Notices are effective when delivered in accordance with this provision, or on the effective date of the notice, whichever is later.

PARTICIPATION IN SIMILAR ACTIVITIES. This MOU in no way restricts Collins or Cooperators from participating in similar activities with other public or private agencies, organizations, and individuals.

ENDORSEMENT. Any of the Town of Lakeview, DEQ, and Lake County's contributions made under this MOU do not by direct reference or implication convey Collins endorsement of Cooperators' products or activities.

NONBINDING AGREEMENT. This MOU creates no right, benefit, or trust responsibility, substantive or procedural, enforceable by law or equity.

The parties shall manage their respective resources and activities in a separate, coordinated and mutually beneficial manner to meet the purpose(s) of this MOU. Nothing in this MOU authorizes any of the parties to obligate or transfer anything of value.

Specific, prospective projects or activities that involve the transfer of funds, services, property, and or anything of value to a party requires the execution of separate agreements and are contingent upon numerous factors, including, as applicable, but not limited to: availability of funds and other resources; administrative and legal requirements (including agency authorization by statute). This MOU neither provides, nor meets these criteria. If the parties elect to enter into an obligation agreement that involves the transfer of funds, services, property, and or anything of value to a party, then the applicable criteria must be met. The negotiation, execution, and administration of these prospective agreements must comply with all applicable law.

TERMINATION. Any of the parties, in writing, may terminate this MOU in whole, or in part, at any time before the date of expiration.

**III. STATEMENT OF MUTUAL BENEFIT AND INTERESTS:** The benefit and interest of the memorandum for Collins is to provide opportunities to continue to use prescribed fire as a forest management tool while at the same time maintaining air quality. Collins does its part to reduce smoke into Lakeview that Collins has direct control over at ground level.

The benefit and interest of the memorandum for the Town of Lakeview is that it helps protect individuals' health in Lakeview by avoiding additional smoke resulting from slash/pile prescribed fires from entering Lakeview. Residents of Lakeview are attempting to control emissions from their wood burning appliances and forest land managers are also doing their part to preserve clean air in Lakeview.

The benefit and interest of the memorandum for Lake County is that it helps protect Lake County citizens that live near Lakeview by avoiding additional smoke resulting from slash/pile prescribed fires from entering Lakeview. Like the Town, individuals near Lakeview are also attempting to control emissions from wood burning appliances and they know forest land managers are doing their part to preserve clean air in their locality.

This memorandum helps DEQ achieve the goal of clean air throughout Oregon and in areas such as Lakeview where PM<sub>2.5</sub> concentrations have periodically affected air quality. It assists DEQ's efforts to protect public health in Lakeview and to support public perception that Collins is responding to the need of clean air in Lakeview. Collins along with the other Cooperators is a partner in this endeavor.

By all parties working together, Collins can still achieve fuels reductions on their forest land, while working with other Cooperators to make sure prescribed fire within the LFSMA is conducted on days that will avoid or eliminate impacts on Lakeview's air quality. In effect, the DEQ's goal of improving air quality in Lakeview will not be compromised by Collins reducing air quality conditions during this designated timeframe. The mutual benefits of clean air in and around Lakeview improve the quality of health.

**IV. TOWN OF LAKEVIEW IN COORDINATION WITH LAKE COUNTY SHALL:**

- A. Provide daily a timely woodstove and prescribed fire advisories between November 1 and February 28 of each year for the primary purpose of curtailing woodstove use and prescribed fire on poor ventilation days. The advisory will also inform forest, agricultural and others who might use prescribed fire as a tool of the best times to burn during the advisory issuing periods. Town of Lakeview shall provide the advisory information via the Internet at:

<http://www.lakevieworegon.org/airquality.html> and phone 541-947-2029.

- a. Town of Lakeview will coordinate with forest land managers by sharing how Green, Yellow, or Red Woodstove Advisory Days and forecasts have been made.

**Lakeview Forest Smoke Management Agreement**

- I. **PURPOSE:** The purpose of this MOU is to document the cooperation between the parties to avoid or minimize any significant smoke impacts to Lakeview caused by prescribed fire on forest lands managed by Collins in accordance with the following provisions.
  
- II. **MAP:** The following map shows the Lakeview Forest Smoke Management Area (LFSMA) from Thomas Creek to the crest of the Warner Mountains also known as the Goose Valley Airshed Boundary. This boundary is a voluntarily recognized area that encompasses part of the officially recognized SPZ.

**Burden Statement**

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596-0217. The time required to complete this information collection is estimated to average 3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call toll free (866) 632-9992 (voice). TDD users can contact USDA through local relay or the Federal relay at (800) 877-8339 (TDD) or (866) 377-8642 (relay voice). USDA is an equal opportunity provider and employer.



To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

If the material is too small to permit the full statement to be included, the material must, at minimum, include the following statement, in print size no smaller than the text:

*"This institution is an equal opportunity provider."*

- L. **TERMINATION.** Any of the parties, in writing, may terminate this MOU in whole, or in part, at any time before the date of expiration.
- M. **DEBARMENT AND SUSPENSION.** Town of Lakeview, Oregon Department of Environmental Quality, Lake County shall immediately inform the U.S. Forest Service if they or any of their principals are presently excluded, debarred, or suspended from entering into covered transactions with the federal government according to the terms of 2 CFR Part 180. Additionally, should Town of Lakeview, Oregon Department of Environmental Quality, Lake County or any of their principals receive a transmittal letter or other official Federal notice of debarment or suspension, then they shall notify the U.S. Forest Service without undue delay. This applies whether the exclusion, debarment, or suspension is voluntary or involuntary.
- N. **MODIFICATIONS.** Modifications within the scope of this MOU must be made by mutual consent of the parties, by the issuance of a written modification signed and dated by all properly authorized, signatory officials, prior to any changes being performed. Requests for modification should be made, in writing, at least 30 days prior to implementation of the requested change.
- O. **COMMENCEMENT/EXPIRATION DATE.** This MOU is executed as of the date of the last signature and is effective through 12/31/2018 at which time it will expire, unless extended by an executed modification, signed and dated by all properly authorized, signatory officials.



- B. **NOTICES.** Any communications affecting the operations covered by this agreement given by the U.S. Forest Service or Cooperators is sufficient only if in writing and delivered in person, mailed, or transmitted electronically by e-mail or fax, as follows:

To the U.S. Forest Service Program Manager, at the address specified in the MOU.

To Cooperator, at Cooperator's address shown in the MOU or such other address designated within the MOU.

Notices are effective when delivered in accordance with this provision, or on the effective date of the notice, whichever is later.

- C. **PARTICIPATION IN SIMILAR ACTIVITIES.** This MOU in no way restricts the U.S. Forest Service or Cooperator from participating in similar activities with other public or private agencies, organizations, and individuals.
- D. **ENDORSEMENT.** Any of Town of Lakeview, Oregon Department of Environmental Quality, Lake County's contributions made under this MOU do not by direct reference or implication convey U.S. Forest Service endorsement of Cooperators's products or activities.
- E. **NONBINDING AGREEMENT.** This MOU creates no right, benefit, or trust responsibility, substantive or procedural, enforceable by law or equity. The parties shall manage their respective resources and activities in a separate, coordinated and mutually beneficial manner to meet the purpose(s) of this MOU. Nothing in this MOU authorizes any of the parties to obligate or transfer anything of value.

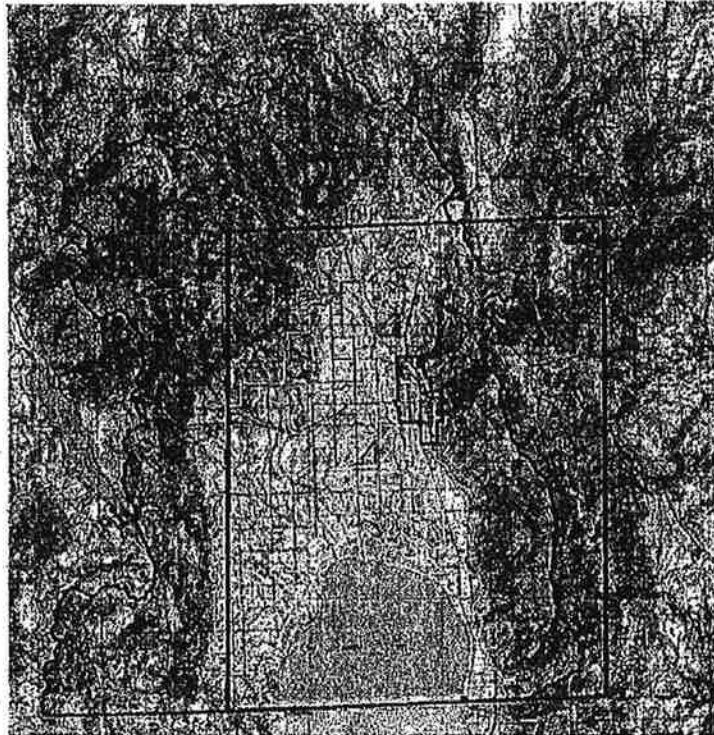
Specific, prospective projects or activities that involve the transfer of funds, services, property, and/or anything of value to a party requires the execution of separate agreements and are contingent upon numerous factors, including, as applicable, but not limited to: agency availability of appropriated funds and other resources; cooperator availability of funds and other resources; agency and cooperator administrative and legal requirements (including agency authorization by statute); etc. This MOU neither provides, nor meets these criteria. If the parties elect to enter into an obligation agreement that involves the transfer of funds, services, property, and/or anything of value to a party, then the applicable criteria must be met. Additionally, under a prospective agreement, each party operates under its own laws, regulations, and/or policies, and any Forest Service obligation is subject to the availability of appropriated funds and other resources. The negotiation, execution, and administration of these prospective agreements must comply with all applicable law



- B. Check the website of the Town of Lakeview to obtain the Green, Yellow, or Red woodstove advisory for that day during the timeframe of November 1 thru February 28.
- C. Monitor each burn, and curtail or extinguish any burn causing smoke impact near the LFSMA, or if a smoke impact is likely based on observation of smoke drift or weather conditions that are likely to result in smoke transport into Lakeview. The decision to curtail or extinguish burning shall be made on a case-by-case basis, taking into account the severity of the smoke impact or expected smoke impact, the ability to effectively control, limit, or extinguish the fire in a manner that does not endanger fire personnel, and the availability of any needed additional resources and personnel. In the event of a smoke impact, the federal land manager shall notify the Town of Lakeview at 541-947-2029 so that appropriate precautions can be made for the general public.
- D. Within the LFSMA: No burning is allowed on Red Woodstove Advisory Days issued by the Town of Lakeview. Burning should be avoided on Yellow Woodstove Advisory Days, however, based on the U.S. Forest Service assessment that no measureable smoke impact will occur within the LFSMA and concurrence from ODF Smoke Management, federal managers may decide to ignite on a Yellow Woodstove Advisory Day. Burning is allowed on Green Woodstove Advisory Days, but also requires an assessment by the U.S. Forest Service that no measureable smoke impact will occur within the LFSMA.
- E. Other LFSMA requirements: On yellow and green days, no pile burning will be conducted if expect the piles will produce significant smoke after the third day. Landowners are responsible for intermittent monitoring for at least three days following ignition to ensure the smoke is not causing an impact to Lakeview. The USFS can waive this provision if it believes that monitoring is unnecessary on a specific burn unit. Any potential mop-up requirements shall be included as an element of the burn plan for units within the LFSMA.

**VII. IT IS MUTUALLY UNDERSTOOD AND AGREED BY AND BETWEEN THE PARTIES THAT:**

- A. **PRINCIPAL CONTACTS**, Individuals listed below are authorized to act in their respective areas for matters related to this agreement

Proposed Lake County  
PM Advance Project Area

## Legend

- ▬ Revised UGL 2014
- ▬ Community NACMS boundary
- ▬ Lake County PM Advance boundary
- ▬ ODF State Land in Project Area
- ▬ Lakeview Station



### III. STATEMENT OF MUTUAL BENEFIT AND INTERESTS:

The benefit and interest of the U.S. Forest Service is to continue to reduce fuel on forest land by using prescribed fire to improve forest landscapes by reducing the buildup of fuels that can contribute to high intensity and high severity fires. The Forest will do its part to reduce smoke into the LFSMA.

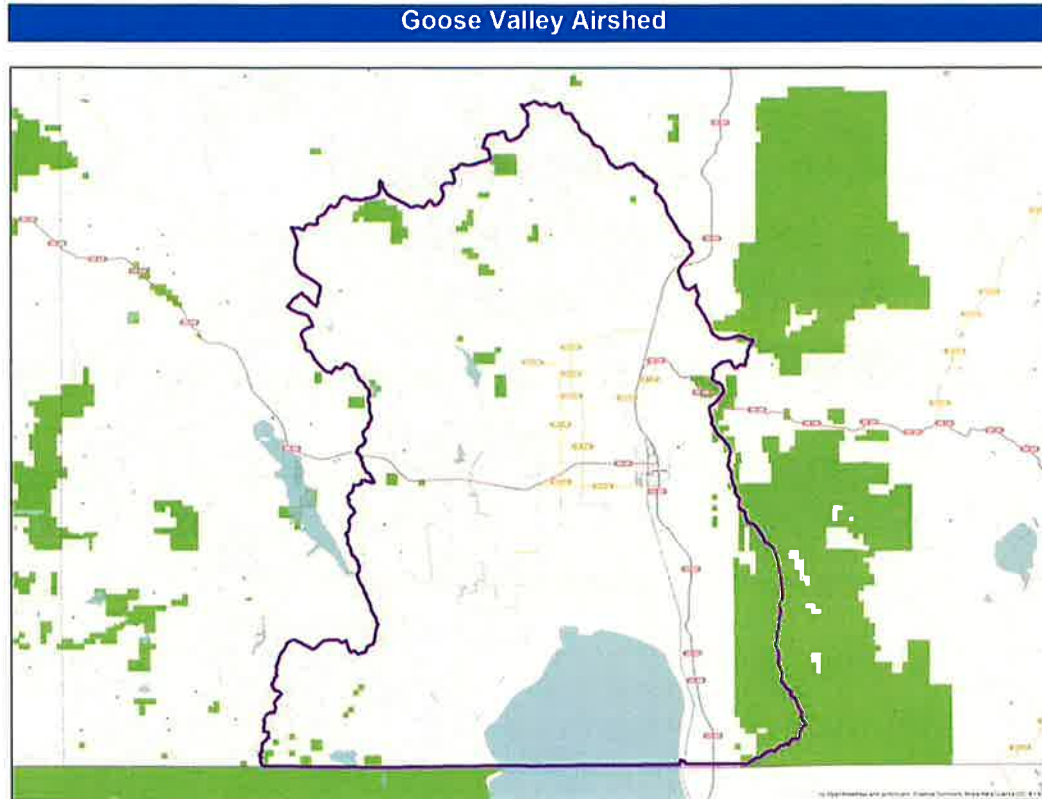
The memorandum benefit and interest for the Town of Lakeview helps protect individuals health in Lakeview by avoiding additional smoke resulting from prescribed fire from entering Lakeview. Locals are attempting to control emissions from their wood burning appliances and federal land managers are also doing their part to preserve clean air in Lakeview.

The memorandum interest and benefit for Lake County helps protect Lake County citizens that live near the Town of Lakeview by avoiding additional smoke resulting from prescribed fire from entering Lakeview. Like the Town, individuals near Lakeview are also attempting to control emissions from wood burning appliances and they know federal land managers are doing their part to preserve clean air in their locality.

This memorandum helps DEQ achieve the goal of clean air throughout Oregon and especially in near nonattainment areas such as Lakeview. It assists DEQ efforts to


# Appendix B – Forestry Agreements


The forest Agreements for both the USFS and Collins are included in this Appendix address the area depicted as the Goose Valley Airshed in the map below:



## 9. Representatives

This plan is acknowledged as a living document and may be changed from time to time but becomes effective on the last date written below:

  
\_\_\_\_\_  
Ken Kestner, County Commissioner  
Lake County

  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Mike Patrick, Town Mayor  
Town of Lakeview

  
\_\_\_\_\_  
Date

# 8. RECOGNITION AND ACKNOWLEDGMENTS

## 8.1 Acknowledgments

The Lakeview community has rallied behind this Action Plan and numerous individuals have made this Action Plan possible. Special appreciation goes to:

- Lakeview and Lake County Air Quality Advisory Committee;
- Lake County Task Force through the Governor’s Regional Solutions Team - In a separate action, DEQ early on, in collaboration with Lake County and the Town, convened the Lakeview Air Quality Task Force, a separate committee that focused on economic issues, to help develop and recommend economic-related strategies to improve Air Quality in Lakeview and the surrounding area. The Task Force met in November 2012 and continued to meet until June 2013 to examine community values, and pollution reduction strategies also. The Task Force identified funding sources, strategies and expertise to improve air quality, weatherization, and educational resources. This information was provided to the Lakeview and Lake County Air Quality Advisory Committee.
- Ray Simms, Mike Patrick, Ken Kestner and staff at the Town of Lakeview and Lake County.

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Lakeview and Lake County Air Quality Advisory Committee

**Table 5: Design Value for 2019, Utilizing Strategies**

<u>Strategies</u>	Concentration Reduction as a result of Emission Reduction ( $\mu\text{g}/\text{m}^3$ )
<i>Existing Strategies - Ongoing</i>	
Woodstove Changeout Programs (2011-2013)	Included in reduction to 2019
Normal reductions including attrition, new woodstoves, Heat Smart and Wood Stove Changeouts	Assumed in reductions to 2019
<i>New Strategies</i>	
Increased Public Education and Awareness (6%)	4.0
Amend former ordinances - mandatory woodstove curtailment in UGB <sup>9</sup>	10.7
Weatherization of homes	0.4
Prohibiting Open Burning in the UGB during winter heating season	0.5
Prescribed burning agreement with USFS	No credit taken

**Table 6: Design Value for 2011 and 2019 based on Strategies**

	2011 $\mu\text{g}/\text{m}^3$	2019 $\mu\text{g}/\text{m}^3$
Design Value (DV)	<b>47</b>	<b>32</b>

Since the future year 24-hour average concentration levels meet the NAAQS ( $35 \mu\text{g}/\text{m}^3$ ) at the monitor, the attainment of the standard is demonstrated at this location with the application of the current and proposed quantifiable strategies. As mentioned earlier, any high monitored events in the future where the community exceeds the daily standard could put the Lakeview area at risk of not meeting the standard. The 2013 exceedences demonstrate this risk.

<sup>9</sup> Includes changing the advisory threshold for red days to  $30 \mu\text{g}/\text{m}^3$

## 5.1.2 Continued Community Involvement and Strategy Evaluation

The advisory committee will continue to conduct public outreach by keeping community members informed of air quality conditions and educating the community regarding the implementation of any new strategies. The committee also agreed to hold annual meetings to assess the effectiveness of this PM Advance Plan, and determine if additional strategies should be implemented in the event the Lakeview area fails to meet the standard. These check-ins will help the Lakeview area identify whether it will meet the standard by 2019, and if not, the committee will reconvene, identify, and recommend additional strategies that could be implemented to ensure progress towards meeting the standard. Additionally, DEQ in conjunction with the town and county will prepare an annual status report for the local leaders and EPA.

# 6. TECHNICAL ANALYSIS TO SEE IF LAKEVIEW MEETS THE STANDARD

## 6.1 Technical Analysis to Meet the Standard

Technical analysis shows how the Lakeview area will meet the PM<sub>2.5</sub> standard by 2019 through implementation of strategies listed above (provided the stronger strategies are developed and implemented with the broader community outreach component). DEQ used a “proportional rollback/rollforward approach and distance weighting” to conduct the analysis. The analysis shows that future concentrations meet the federal daily standard for PM<sub>2.5</sub> at the monitor.

### 6.1.1 Determination of Baseline Design Value

Technical analysis started with estimating the baseline concentration, or baseline design value, for PM<sub>2.5</sub>. A design value is the mathematically determined pollutant concentration that describes the air quality status of a given area relative to the level of the National Ambient Air Quality Standards (NAAQS). The design value is based on data from the DEQ Center and M Street monitor at which the PM<sub>2.5</sub> federal reference monitor (FRM – the monitor used to determine attainment with the standard) is located. The base year for the analysis is 2011, and the base monitoring period for constructing the design value includes the years 2009 – 2013. The calculated 2011 baseline design value is 47 µg/m<sup>3</sup> expressed as a 5 year average of the 98% of the data for each year. The calculations on which these results are based summarized in Table 5, below.

Table 4: PM<sub>2.5</sub> values used to calculate baseline design value

Year	PM <sub>2.5</sub> (µg/m <sup>3</sup> )
2009	43
2010	26
2011	36
2012	36
2013	94

#### 5.1.1.2.7 DEQ Sustainment Area Rules

DEQ plans to propose and finalize rules that identify areas not meeting the standard, but not formally designated as nonattainment by EPA, as a sustainment area. For an area such as Lakeview, new sources cannot become established and existing sources cannot expand because the area exceeds the PM<sub>2.5</sub> standard already. The rules are designed to provide incentives for new or modified industrial sources to reduce emissions in the same airshed by purchasing emission offsets from sources that are considered to be significantly contributing to the air quality problems in the area, such as woodstoves. It will still be difficult for large companies to get permitted because DEQ must continue to implement federal regulations for these companies. DEQ's classification of a sustainment area provides flexibility for Lakeview while ensuring the area is protective of air quality.

#### 5.1.1.3 Potential Future Strategies Considered but Not Addressed At This Time

During the advisory committee meetings and community town hall meetings, additional strategies were identified as potential options for future implementation within the Urban Growth Boundary. These strategies, identified below, were not incorporated for immediate action because they lack current funding, may not be able to be implemented in the next five years, or need additional community approval to implement.

##### 5.1.1.3.1 Woodstove Changeouts

The Town of Lakeview and Lake County hope to conduct additional woodstove changeouts in the area beyond current and future efforts underway. Much of this depends on future funding, but the community is actively involved in working with the Oregon Regional Solutions Team and the Oregon Department of Energy to identify additional sources of funding and resources. If successful, the area would develop woodstove changeouts programs for the approaches such as the following:

- 1) Focusing on renters and lower income residents for future woodstove changeouts. (approximately 30% of the housing in Lakeview is comprised of this population.)
- 2) Total replacement of woodstoves with other heating sources besides wood. Future changeouts would involve replacing an uncertified stove with either a natural gas, electric (i.e. ductless heat pumps), or other non-wood heating system..
- 3) Require all change-outs be replaced with non-wood burning devices relative to their proximity to the monitor.
- 4) Continuing to conduct woodstove changeouts to replace uncertified stoves with a certified stove, pellet stove, or heat pump within the greater Lakeview area.

##### 5.1.1.3.2 Local & County Ordinances to Reduce Emissions from Woodstove Use

The town or county will consider options to further reduce woodstove use in the area. This may include local changes to the existing ordinances to reduce the use of woodstoves in the area. These changes will help reduce the amount of wood smoke that can be emitted into the airshed.

- An example may be potential building code changes to reduce the use of woodstoves such as installing only the very lowest emitting stoves in homes or restrictions on type of stove installation.

##### 5.1.1.3.3 Open Burning

The town or county may consider creating a regional composting facility to provide options for residents to bring their yard debris to the facility instead of conducting open burning. Other options include creating or holding a community clean up day for residents to bring their yard debris to the dump.

##### 5.1.1.3.4 Tax Incentives

Another strategy the town and county hope to investigate and explore includes providing a property tax incentive to replace woodstoves. This could include providing a rebate or tax abatement to any resident who replaces an uncertified stove with an alternative heat source. In order to pursue this strategy, legislative authority would be

#### 5.1.1.1.2 Heat Smart Program - Uncertified Stove Removal upon Sale of Home

Since 2008, in Lakeview and Lake County uncertified stoves are required to be removed when a home is sold (including stoves in garages and outbuildings). See

<http://www.deq.state.or.us/aq/burning/woodstoves/heatSmart.htm>

#### 5.1.1.1.3 Open Burning Prohibitions

The Town of Lakeview and Lake County established a 2008 ordinance prohibiting outdoor open burning inside the Town limits between November 1 and February 28<sup>th</sup> of each year.

#### 5.1.1.2 Future Strategies

As mentioned earlier, the Advisory Committee identified and recommended a number of strategies to be implemented now or within the next year. Some of these strategies are already implemented or will be implemented pending approval of town and county ordinances or DEQ rules.

##### 5.1.1.2.1 Public Education and Awareness

Lakeview and Lake County plans to continue and expand educational efforts regarding reducing PM<sub>2.5</sub> emissions from wood smoke. Education has had an impact on reducing wood smoke in the past, and the county intends to enhance current educational strategies. DEQ has provided funding to the County, through an interagency agreement, to assist in educating the Lakeview community about proper use of woodstoves and reducing wood smoke. Under the agreement, Lakeview will be required to provide programs that include hands-on demonstration of wood stove use, dissemination of information about the health effects of wood smoke, videos on public access to informational websites, and outreach to teach homeowners about selection of wood appropriate for burning.

The educational efforts include:

- 1) Changing the curtailment call times to noon to noon of the following day. Currently the advisory call is posted at 7:30 a.m.; changing the time would allow those people who rise earlier in the morning to better plan whether to burn in their stove.
- 2) Hanging red/yellow flags in front of schools. The flag program involves hanging a red, yellow, or green flag in front of the school to notify the public of the local advisory. This provides additional awareness of the curtailment advisory in addition to the regular notification through the website and phone.
- 3) General education on burning properly, wood storage, seasoned wood, and types of wood to burn
- 4) Use of social media to inform residents of curtailment calls, such as:
  - a. The Town's Facebook page
  - b. Coordinating with local newspaper to put information on their webpage
  - c. E-mail blasts to residents
- 5) Conducting follow up calls and visits to households who have had a woodstove changeout within the past year or two.
- 6) Public education in schools and service groups
- 7) Effects of PM<sub>2.5</sub> and why residents should care
- 8) Installation of reader board (in a high visibility spot) to inform residents of curtailment call
- 9) Encouraging the use of biobricks on red days

##### 5.1.1.2.2 Mandatory Woodstove Curtailment Program

Back in the 1990's, the Town of Lakeview and Lake County had an existing air quality ordinance requiring residents to curtail all their residential wood combustion on red days (high pollution, high health risk days) and curtail their uncertified woodstove use on yellow days (moderate pollution days). This ordinance was in effect because the area was violating the PM<sub>10</sub> standard, however the Lakeview area quickly came into compliance and the mandatory program reverted to a voluntary curtailment program. Now that Lakeview is struggling to meet the PM<sub>2.5</sub> standard, both the town and county have modified existing ordinances to implement the mandatory curtailment program again. The main provisions of the revised ordinance include:

# 5. ACTION PLAN STRATEGIES – EMISSION REDUCTION MEASURES

Over the years Lakeview and DEQ have developed strategies to manage particulate matter air pollution concentrations in the Lakeview area, based in part on its history of dealing with particulate (PM<sub>10</sub>) pollution from the early-1990s. The emission reduction measures identified in this section include actions to address wood smoke, restrictions on residential open burning, and public education.

## 5.1 Lake County and Town of Lakeview Air Quality Advisory Committee Strategy Recommendations

In 2012-13, DEQ, the Town of Lakeview and Lake County convened an advisory committee, called the Lakeview and Lake County Air Quality Advisory Committee, to help develop strategies to be implemented as part of this Action Plan. The committee identified a number of strategies and decided to conduct a comprehensive community outreach and involvement effort to solicit additional strategy ideas from the community and identify which of these strategies the community would be willing to implement.

The committee held three community-wide stakeholder meetings from February – April 2014, and then reconvened and evaluated all the identified strategies. The committee and the Lakeview community recognized that strong strategies had to be identified by the community to ensure compliance with the standard by 2019. Based on issues and thoughts raised during the town hall meetings, the advisory committee chose a number of recommendations to decision makers as to which strategies should be implemented. It is anticipated these strategies will be implemented over the next year (2013-2014).

### 5.1.1. Recommended Strategies for Implementation

Table 3 highlights the identified strategies by the advisory committee and the town hall community meetings. It includes the current, new, and future planned strategies, as well as the anticipated timeframe for implementation. A description of each strategy is discussed in more detail below.

**Table 3: Path Forward Strategies for the Lakeview Area**

Strategy	Anticipated Implementation Timeframe
<b>Existing Strategies</b>	
Woodstove Changeout Program & Weatherization of Homes (ARRA funds, ODOE, OHA, SEP, RST funding)	2011-2013
Heat Smart Program, Woodstove Attrition	Ongoing
Open Burning Prohibitions within the Town Limits from	Ongoing

Adjustments were made to the future emission inventories to account for these strategies which are already in place, but the reductions have not been fully realized yet to affect the 2011 emission inventory. The full effects of the reductions are expected to be in place in the next few years. They include:

- Woodstove Changeout Program in Lakeview
- Heat Smart: Statewide Stove Removal upon Sale of Home

These existing control measures are discussed in more detail below.

The decrease in emissions for the design day is the most significant in wood combustion emissions. The ongoing implementation of existing strategies is expected to provide some reductions in concentrations from wood combustion. Figure 6 shows distribution of emission inventory for 2011 and for 2019 by source category.

Permitted industrial point source emissions increase between 2011 and 2019. 2011 levels are based on 2011 actual emissions and 2019 levels are based on updated permits and modifications that occurred for industrial sources in 2013 and 2014. However, point source emissions may decrease due to better technology and emissions reductions as the result of better control equipment or fuel use.

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<sup>8</sup> Strategies currently implemented and effective as of December 31, 2013.

#### 4.2.2.4 Reporting and Results

Emission estimates are developed for both annual and seasonal PM<sub>2.5</sub> emissions. Annual emissions are reported as tons per year (tpy), whereas typical season and design day emissions are reported as pounds per day (lbs/day). For 2011, the design day emissions were emissions during the wood heating season that occurred on days when the highest monitored concentrations or design value (DV) concentrations were measured. For Lakeview, the typical season and design days occurred in winter (November through February) when historically the daily PM<sub>2.5</sub> standard is most frequently exceeded. For the base year, daily emissions were adjusted to reflect a typical season day and design day emissions. For future year emissions, the goal is to develop an emissions inventory that closely matches the conditions under which high monitored concentrations are likely to be measured. The DV is used to determine compliance with the standard, and methodology for calculating the DV is described in more detail in the section entitled “Technical Analysis to Meet the Standard”.

The design day emissions for area, on-road, non-road and industrial sources are shown in Table 1.

**Table 1: 2011 Design Day PM<sub>2.5</sub> Emissions for the Lakeview Analysis Areas**

	Design Day (lbs/day)
Residential Wood Combustion	704
Prescribed Burning and Wildfire	0
All Other Area Sources <sup>6</sup>	39
On-Road	2
Non-road Vehicles & Equipment	3
Permitted Industrial Sources	182
<i>Total, All Sources, lbs/day</i>	930

For a more complete emission inventory please refer to Appendix A.

### 4.3 Future Year Emission Forecast (2019)

The future year inventory is an estimation of emissions for the milestone year of 2019, the timeframe for which this action plan was developed. It includes projected emissions for the future year based growth rates for population, employment, or VMT (vehicle miles traveled) through 2019. DEQ also took credit for emissions reductions as a result of current strategies (or control measures) already being implemented but not accounted for in the 2011 emission inventory. A complete emission forecast can be found in the emission inventory in Appendix A.

#### 4.3.1 Determining the Attainment Year Emission Inventory

##### 4.3.1.1 Growth Rates

<sup>6</sup> Including wood heating used for commercial or business spaces requiring heat.

## 4.1 Precursors

In addition to direct (primary) emissions, particulate matter is formed in the atmosphere from precursors. Sulfur oxides (SOX), nitrogen oxides (NOX), volatile organic compounds (VOC), and ammonia (NH<sub>3</sub>) all contribute to the formation of particulate matter. DEQ evaluated whether PM<sub>2.5</sub> precursors should be addressed in the emission inventory. DEQ looked at filter samples and initial emissions inventory estimates and determined secondary formation is very small (less than 5%) compared to direct PM<sub>2.5</sub> emissions. Based on this analysis and the fact that any strategies to address precursor emissions would be negligible, DEQ decided not to evaluate any precursor emissions in this PM Advance Plan.

## 4.2 Base Year Emission Inventory (2011)

The base year emission inventory is used as the starting point and serves as the foundation for the future emissions forecast (2019) to determine whether Lakeview will meet the standard. This inventory includes all sources in the Lakeview area in the UGB. DEQ analyzed a number of factors to determine the appropriate year for the base emission inventory.

### 4.2.1 Determining the Base Year Emission Inventory

A “base year” emissions inventory (EI) was created to estimate actual PM<sub>2.5</sub> emissions occurring in the airshed. For the Lakeview area, the PM<sub>2.5</sub> base-year EI is 2011. The base year EI serves as the foundation for the 2017 interim year and 2019 future emissions forecast to help determine whether Lakeview will meet the standard. 2011 is a year for which DEQ completed the National Emission Inventory (NEI) for Lake County. In some cases where current data wasn’t available, DEQ used 2008 data. The Lake County inventory was scaled to obtain an estimate of Lakeview’s UGB. The complete emission inventory can be found in Appendix A.

### 4.2.2 Source Category Distribution of 2011 Emission Inventory

Sources of PM<sub>2.5</sub> in Lakeview include area sources (e.g., woodstoves), permitted industrial point sources, on-road mobile sources (e.g. car and truck exhaust, road dust), non-road mobile sources (e.g., construction equipment). The following sources and pie charts represent the main emission sources in the Lakeview area in 2011. (Figure 5)

# 3. LAKEVIEW AREA GEOGRAPHIC BOUNDARY

Lakeview is located in south central Oregon about 96 miles east of Klamath Falls at an elevation of about 4,800 feet. The area is typified by semi-arid climate where annual rainfall is 13 inches. The town of Lakeview serves as an important commercial center for Lake County. Lakeview has a current air quality boundary for PM<sub>10</sub>, which consists of the Lakeview urban growth boundary. (Figures 3 & 4)

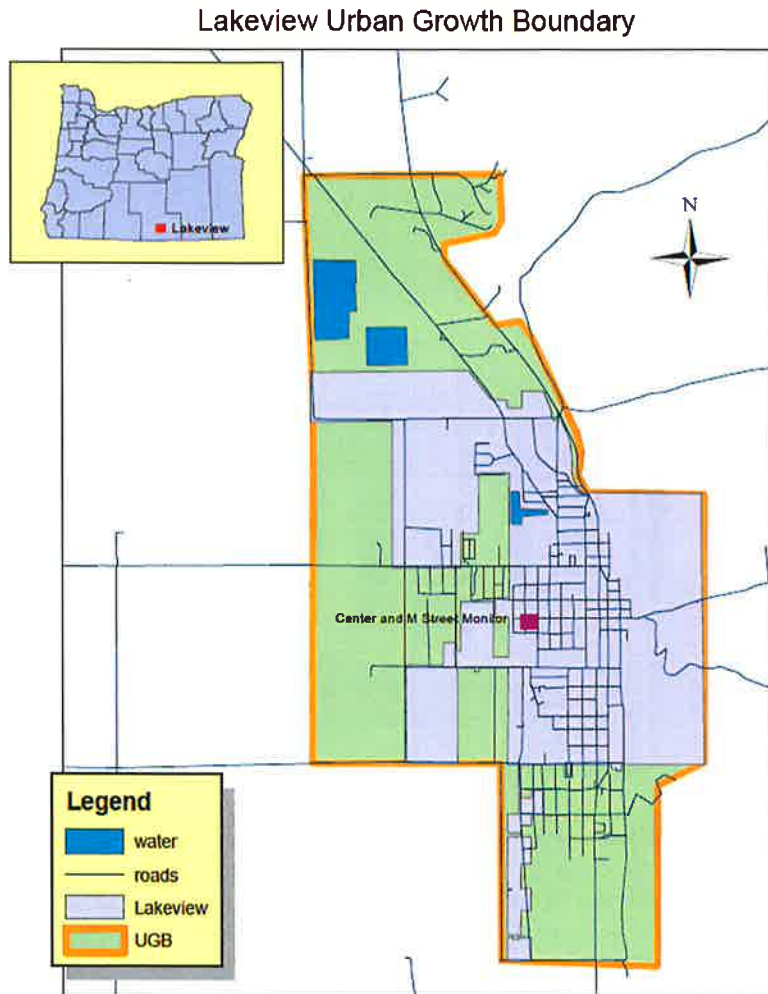


Figure 3: Lakeview Urban Growth Boundary

## 2. LAKEVIEW AREA DESCRIPTION

Lakeview is located in south Oregon about 96 miles east of Klamath Falls at an elevation of about 4,800 feet. The area is typified by semi-arid climate where annual rainfall is 13 inches. The Lakeview urban growth boundary (UGB) population is estimated at 3,800 in 2010. Based on the long-range forecast, the Lakeview UGB population is expected to grow to approximately 3,925 by 2025. The town of Lakeview serves as an important commercial center for Lake County.

The recent 2008 recession has impacted Lake County and the area is slowly recovering. Current unemployment rates in Lake County (~10%) are still higher than the statewide average of 7%.<sup>1</sup> According to the U.S. Census data, the median family income in Lake County is around \$40,000 with roughly 17% of the population below the poverty level.<sup>2</sup>

Lakeview can experience very strong nighttime inversions that break up with daytime solar heating. In the wintertime, arctic air masses frequently move over the Lakeview area valley. Temperatures can remain well below freezing for several weeks at a time. Winter nights are commonly clear and cool in the valley. Under these conditions, inversions and air stagnation can occur and reoccur for many days in a row over Lakeview.

### 2.1 MONITORING

The Lakeview area has one particulate (PM<sub>2.5</sub>) monitoring site with the sampler located on the corner of Center and M Street. DEQ has monitored at this site since 1991 for PM<sub>10</sub> and since 2007 for PM<sub>2.5</sub>. The location represents one of the higher PM<sub>2.5</sub> concentration areas and is representative of areas where people live, work, and play. After quality assurance, data from the site is transferred to databases at DEQ and EPA. Data from the monitor was used as the basis for the action plan and for determining compliance with the standard. Speciated data is available in Appendix E.

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<sup>1</sup> The Oregonian, March 24, 2014,  
[http://www.oregonlive.com/money/index.ssf/2014/03/unemployment\\_rates\\_still\\_twice\\_as\\_high\\_in\\_some\\_oreg\\_on\\_counties\\_compared\\_to\\_others\\_interactive\\_map.html](http://www.oregonlive.com/money/index.ssf/2014/03/unemployment_rates_still_twice_as_high_in_some_oreg_on_counties_compared_to_others_interactive_map.html)

<sup>2</sup> <http://quickfacts.census.gov/qfd/states/41/41037.html>

base year (2011). After applying the strategies identified above, if the area does not experience a prolonged stagnation event in the future, the area should meet the standard.

**Estimated concentrations of PM<sub>2.5</sub> for 2011 and 2019 based on emission reduction strategies.**

	2011 µg/m <sup>3</sup>	2019 µg/m <sup>3</sup>
Estimated Concentration of PM <sub>2.5</sub>	<b>47</b>	<b>32</b>

Other long term strategies were offered and will show additional reductions if they come to fruition, but cannot be quantified at this time.

The committee also agreed to have annual check-in meetings (June-July timeframe) to assess the monitored levels and Lakeview's progress towards meeting the standard. These check-ins will help the Lakeview area identify whether it will meet the standard by 2019, and if not, the committee will reconvene, identify, and recommend additional strategies that could be implemented to ensure progress towards meeting the standard.

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# LAKEVIEW AREA - PARTICULATE MATTER (PM<sub>2.5</sub>) ADVANCE ACTION PLAN

Submitted to: U.S. Environmental Protection Agency



By: Town of Lakeview, Lake County and  
the Oregon Department of Environmental Quality

September 2014

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# Maintenance Requirements


You will need to maintain the unit according to the manufacturers instructions. Use the coupon code **BREATHEZ** for 20% off filters and supplies.

To purchase replacement Winix filters: call **(877) 699-4649** or order online [www.winixamerica.com](http://www.winixamerica.com)

**Please contact the manufacturer directly for all maintenance and operations questions. We recommend ordering replacement filters at your earliest convenience.**

## 1. Know The Filters

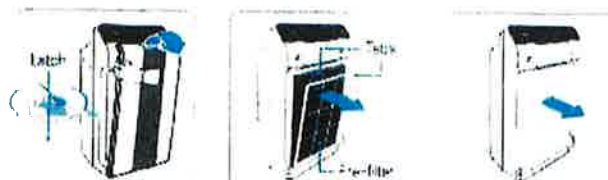
When the Check Filter indicator (red arrow) is lit, it is time to replace both the True HEPA and AOC™ Carbon Filters.

Filter	Indicator Light	When to service	When to replace
1 Pre-filter	none	Clean once every 14 days	Permanent
2 AOC™ Carbon filter	 Check Filter	Clean once every 3 months	Lasts up to 12 months
3 True HEPA filter		Can NOT be WASHED	

- Interval between filter replacement may vary depending on environment
- For optimal use, Pre-filter should be cleaned toward 14 days which does extend the life of other filters

## 2. Removing Filters

Turn the unit power OFF before removing filters.



- 1 Remove the front panel by grasping its upper edge and gently pulling forward.
- 2 Press on the Pre-filter tabs near the top of the filter, release and remove.
- 3 Pull out the AOC™ Carbon filter and True HEPA Filter

## 3. Preparing New Filters

- 1 Remove replacement filters from protective plastic wrap.
  - Opening the wrap without touching the filters pleats will help to avoid pleat damage. (do not touch the pleats)

