Oregon Department of Environmental Quality
Jan. 24-25, 2019
Oregon Environmental Quality Commission Meeting
Agency Staff Report
Rulemaking, Action Item B

Amendments to Oregon Smoke Management Plan and the Oregon State Implementation Plan for Air Quality

Table of Contents

Accessibility Information

You may review copies of all documents referenced in this announcement at:
Oregon Department of Environmental Quality
700 NE Multnomah St., Ste. 600
Portland, OR, 97232

To schedule a review of all websites and documents referenced in this announcement, call Peter Brewer, 541-633-2004, (or 800-452-4011, ext. 5622 toll-free in Oregon).

Please notify DEQ of any special physical or language accommodations or if you need information in large print, Braille or another format. To make these arrangements, contact DEQ, Portland, at 503-229-5696 or call toll-free in Oregon at 1-800-452-4011, ext. 5696; fax to 503-229-6762; or email to deqinfo@deq.state.or.us. Hearing impaired persons may call 711.

DEQ Recommendation to the EQC

DEQ recommends that the Environmental Quality Commission:

Approve incorporating the rule amendments as seen on pages 27 through 60 into the Oregon Clean Air Act State Implementation Plan under OAR 340-200-0040, with the date updated as shown on page 26; and

Direct DEQ to submit the SIP revision to the U.S. Environmental Protection Agency for approval.

Proposed EQC motion language:

I move that the Oregon Environmental Quality Commission:

- *Approve incorporating the rule amendments as seen on pages 27 through 60 of the staff report for this item into the Oregon Clean Air Act State Implementation Plan under OAR 340-200-0040, making the change of date as seen on page 26 of the staff report for this item, and*
- *Direct DEQ to submit the SIP revision to the U.S. Environmental Protection Agency for approval*

Overview

Short summary

DEQ proposes that the Oregon Environmental Quality Commission approve updates to the Oregon Smoke Management Plan and associated updates to the Oregon Clean Air Act State Implementation Plan.

History

The Oregon Department of Forestry oversees prescribed forest burning in Oregon to eliminate unwanted forest debris, restore forest health and reduce the potential for major wildfires. Each year, ODF burns approximately 150,000 acres of Oregon forests through the practice of prescribed burning. Smoke from this burning can occasionally pose a risk to public health and result in air quality levels exceeding the federal air quality standard for fine particulate matter, also called PM2.5. Even brief exposures to smoke can cause health problems for persons with asthma, emphysema, congestive heart disease and other existing medical conditions. People who are elderly, pregnant and young children are especially high-risk groups. Smoke from forest burning also affects visibility in national parks and wilderness areas, as well as general outdoor recreation activities.

State law ORS 477.013 directs ODF to develop a smoke management plan for prescribed forestry burning in Oregon and to promulgate rules to carry out this plan. Consistent with the law, ODF developed the Oregon Smoke Management Plan, which consists of rules under OAR 629-048 and the Operational Guidance for the Oregon Smoke Management Program in directive 1-4-1-601. ODF implements the plan through a smoke management program for prescribed burning on federal, state and private forestland.

Adopted as a regulatory program in 1972, the objective of the smoke management program is to maximize burning opportunities, reduce the risk of wildfire, and minimize smoke impacts on the public. Most of the larger cities and heavily populated areas in Oregon are designated as Smoke Sensitive Receptor Areas by ODF, and have greater restrictions on prescribed burning to prevent smoke intrusions. ODF's smoke management office in Salem conducts daily weather forecasts to determine areas in the state suitable for forestry burning, then issues daily burning instructions for those areas that include size limits in tons, how far apart to space the burning and distance from Smoke Sensitive Receptor Areas. The forest district-level offices make the actual decision on which units to burn based on the burning instructions. Each burn unit has a burn plan and pays burn fees. After burning, the district reports back to State Forestry in Salem on the burning accomplished.

As directed under state law, ODF adopts all rules associated with the plan through its Board of Forestry. State law ORS 477.013 provides DEQ with joint approval authority of the plan and cites the need to "meet the air quality objectives of the federal Clean Air Act." To ensure prescribed burning meets the federal Clean Air Act, DEQ previously adopted the plan into the

Oregon Clean Air Act State Implementation Plan as provided in DEQ rule OAR 340-200-0040, and any changes to the Oregon Smoke Management Plan require DEQ approval as a State of Oregon Clean Air Act Implementation Plan revision.

ORS 477.552 states the need to "improve the management of prescribed burning as a forest management and protection practice" and to "minimize emissions from prescribed burning consistent with the air quality objectives of the federal Clean Air Act and the State of Oregon State Implementation Plan." In order to improve the management of prescribed burning, every five years DEQ and ODF conduct a review of the plan to evaluate the effectiveness of the smoke management program. The last plan review was in 2012.

ODF's proposed rulemaking primarily affects private forest landowners, and state and federal land managers who conduct prescribed burning under the Oregon Smoke Management Plan. DEQ's proposed amendment to OAR 340-200-0040 incorporates ODF rule changes into State of Oregon Clean Air Act Implementation Plan, and does not change the regulated parties.

Proposed Amendments to the Oregon Smoke Management Plan under ODF Rule OAR 629-048

About every five years, ODF conducts a periodic plan review with an advisory committee and DEQ participation. For the most recent review, ODF convened the Smoke Management Review Committee that met five times during 2017 and 2018. Committee recommendations and input from the ODF Board of Forestry are the basis for ODF's proposed amendments to the Oregon Smoke Management Plan.

Highlights of the committee's recommendation and additional recommendations by the Board of Forestry include:

1. Editing the language of the Smoke Management Plan Objectives to read:
    a. Minimize smoke emissions resulting from prescribed burning as described by ORS 477.552;
    b. Provide maximum opportunity for essential forestland burning;
    c. Protect public health by avoiding intrusions;
    d. Coordinate with other state smoke management programs;
    e. Comply with state and federal air quality and visibility requirements; and
    f. Promote the further development of techniques to minimize emissions by encouraging cost-effective utilization of forestland biomass, alternatives to burning, and emission reduction techniques.

2. Revising the definition of smoke intrusion (OAR 629-048-0005) to include a one-hour threshold at or above 70 ug/m3 and a 24-hour average at or above 26

micrograms per cubic meter, measured midnight to midnight on the first day of smoke entrance into a community.

3. Adding a "smoke incident" definition, which means the verified entrance of smoke from prescribed burning into a Smoke Sensitive Receptor Area at levels below a smoke intrusion, other areas sensitive to smoke, or a community other than an Smoke Sensitive Receptor Area.

4. Including a Community Response Plan and Exemption Request process:
    a. ODF Salem headquarters will develop and distribute a communication framework that will include at least: (1) the purpose and importance of prescribed burning, (2) the health risks of wildfire and prescribed fire smoke, (3) how smoke sensitive receptor areas (SSRA designated communities) residents can find out about daily burn plans, and (4) notification of potential prescribed burn smoke impacts.

    b. ODF and DEQ will recommend that Smoke Sensitive Receptor Areas that have experienced repeated smoke incidents and intrusions develop a community response plan lead by the local health department, and in coordination with the local ODF or federal forest district office, on how to respond when notified that prescribed burning smoke may enter their community.

    c. Communities that develop a community response plan may request an exemption to the one-hour intrusion threshold through their local governing body and County Commission. The request for exemption will be considered for approval by ODF and DEQ under the advisement of Oregon Health Authority.

5. Updating some Special Protection Zone requirements adopted in 1992 to provide extra smoke management protection during the winter months for communities that exceeded federal air quality health standards:

    a. Modify the SPZ for the Medford, Lakeview, Klamath Falls, and Oakridge area to have the SPZ boundaries better fit the natural ridgelines and features of the areas impacted instead of straight boundaries across the varied landscape. The proposed revised SPZs will better protect the areas by conforming to the natural boundaries of the respective air basins. Inside the boundary, prescribed burning would continue to follow the daily green, yellow, and red woodstove restrictions. Outside the boundary, prescribed burning would be prioritized to reduce burning on "red" woodstove days, by only allowing smaller burn units that are farther away from the areas.

6. Adding an alternative to burning recommendation of removing or minimizing large fuel concentrations and heavy fuel loadings to minimize smoldering;

7. Allowing increased usage of polyethylene sheeting on burn piles by removing the size limitation of 100 square feet and allowing the size of the sheeting to vary as necessary to achieve rapid ignition and combustion of the pile. A study of the emissions resulting from burning a wet forest biomass pile and a similar one covered with a polyethylene sheet showed the emission levels from combustion of the piles to be less when the pile was well covered and a portion dry than from the non-covered pile.

8. Other miscellaneous revisions to the ODF rules concerning the Oregon Smoke Management Plan.

Regulated parties

The proposed amendment of Oregon Administrative Rule 340-200-0040 to incorporate the Oregon Smoke Management Plan into the State of Oregon Clean Air Act Implementation Plan does not change the currently regulated parties. The regulated parties are private forest landowners and state and federal land managers who conduct prescribed burning under the Oregon Smoke Management Plan.

Request for other options

During the public comment period, DEQ requested public comment on whether to consider other options for achieving the rules' substantive goals while reducing the rules' negative economic impact on business and negative impacts on people in areas of potential exposure to smoke from prescribed fire activities.

Statement of Need

What need would the proposed rule address?

The Oregon Smoke Management Plan consists of both ODF-developed rules under OAR 629-048, and guidance under directive 1-4-1-601, Operational Guidance for the Oregon Smoke Management Program. State law (ORS 477.013) requires the plan and any changes to the plan be approved by both the State Forester and the Oregon Environmental Quality Commission, DEQ's policy and rulemaking body.

In order to ensure prescribed burning meets the federal Clean Air Act, the EQC previously adopted the plan into the Oregon Clean Air Act State Implementation Plan (SIP), under OAR 340-200-0040, and EPA incorporated the plan into the federally-approved SIP. When the plan is amended, the EQC must adopt the change into the SIP by amending OAR 340-200-0040. DEQ then would submit this SIP revision to EPA for approval and incorporation into the federally-approved SIP.

How would the proposed rule address the need?

The proposed rulemaking would adopt changes to the Oregon Smoke Management Plan into the Oregon Clean Air Act State Implementation Plan, and thereby meet DEQ's responsibility to maintain compliance with the Clean Air Act.

How will DEQ know the rule addressed the need?

DEQ will know the need has been addressed when EPA reviews and approves the changes to the Oregon Clean Air Act State Implementation Plan.

Rules Affected, Authorities, Supporting Documents

Lead division
Air Quality
Program or activity
Planning Section, Smoke Management Program
Chapter 340 action

Rules Amended – OAR 340

340-200-0040

Statutory Authority - ORS

468.020 468.065 468A

Statutes Implemented - ORS

468A.035 468A.135

Other authority
ORS 477.013, 477.552,477.554, and 183.335(2)(b)(C)

Documents relied on for rulemaking

Document title	Document location
OAR 629-048-0001 through 629-048-0500	https://secure.sos.state.or.us/oard/view.action?ruleNumber=629-048-0001
Proposed Amended ODF Rules: OAR 629-048-0001, 629-048-0005, 629-048-0010, 629-048-0020, 629-048-0110, 629-048-0120, 629-048-0140, 629-048-0150, 629-048-0200, 629-048-0210, 629-048-0220, 629-048-0230, 629-048-0310, 629-048-0320, 629-048-0450 and 629-048-0500 **Proposed New ODF Rules:** OAR 629-048-0021, 629-048-0135, 629-048-0137, 629-048-0180	Provided on pages 28 through 61 of this document
Operational Guidance for the Oregon Smoke Management Program – Directive 1-4-1-601	Provided as Supporting Document 3

Fee Analysis

DEQ's rulemaking does not involve fees. ODF's rulemaking makes a clarification to burn fees for different types of burn treatments. Please see ODF proposed rule amendments at the end of this document for that information.

Statement of Fiscal and Economic Impact

Fiscal and Economic Impact

This proposed DEQ rulemaking does not have a fiscal or economic impact on the public, units of local government, or state agencies. This proposal would adopt ODF amendments to the Oregon Smoke Management Plan into the Oregon Clean Air Act State Implementation Plan (SIP), as referenced in DEQ rules under OAR 340-200-0040. This document addresses the fiscal and economic impact of the EQC adopting into the SIP the plan amendments approved by ODF. ODF has prepared a similar document that addresses the fiscal and economic impact of the plan amendments they are proposing to adopt, as part of this joint rulemaking effort. The ODF fiscal impact statement is attached at the end of this document.

Statement of Cost of Compliance

This proposed rulemaking does not have any significant economic effect on businesses nor will small businesses incur any costs of compliance because it is an administrative action whereby the EQC would adopt ODF plan amendments into the SIP. For a description of the economic effects and costs of compliance of ODF's rulemaking, see the ODF fiscal impact statement attached.

Impact on other government entities other than DEQ

a. Local governments: No significant impact
b. State agencies: No significant impact

Public

There is no significant fiscal or economic impact on the general public.

Large businesses - businesses with more than 50 employees

This proposal would have no significant fiscal or economic impact on large businesses.

Small businesses – businesses with 50 or fewer employees

a. Estimated number of small businesses and types of businesses and industries with small businesses subject to proposed rule.

This proposal does not affect small businesses.

b. Projected reporting, recordkeeping and other administrative activities, including costs of professional services, required for small businesses to comply with the proposed rule.

As this proposal does not affect small businesses, no additional activities apply to small businesses.

c. Projected equipment, supplies, labor and increased administration required for small businesses to comply with the proposed rule.

As this proposal does not affect small businesses, small businesses do not need additional resources to comply.

d. Describe how DEQ involved small businesses in developing this proposed rule.

As this proposal does not affect small businesses, small businesses were not involved in developing this proposal.

Documents relied on for fiscal and economic impact

DEQ did not rely on any documents to develop this statement of fiscal and economic impact other than the fiscal impact developed by ODF for their proposed rules, ODF's proposed rules themselves, and implementing Directive. ODF's fiscal impact, proposed rules, and implementing Directive are included with this document.

Advisory committee

DEQ did not appoint an advisory committee; however, ODF did convene the Smoke Management Review Committee in the development of their changes to the Smoke Management Program rules. ODF relied on this committee for evaluating economic impacts of its rulemaking. The amendments being proposed to the plan are based on recommendations developed by this committee.

Housing cost

As ORS 183.534 requires, DEQ evaluated whether the proposed rules would have an effect on the development cost of a 6,000-square-foot parcel and construction of a 1,200-square-foot detached, single-family dwelling on that parcel. DEQ determined the proposed rules would have no effect on the development costs because the proposed plan amendments and adoption into the SIP does affect housing or related costs.

Federal Relationship

ORS 183.332, 468A.327 and OAR 340-011-0029 require DEQ to attempt to adopt rules that correspond with existing equivalent federal laws and rules unless there are reasons not to do so.

The proposed rules are not different from or in addition to federal requirements. By adopting ODF's plan amendments into the SIP, this rule proposal does not impose requirements different from or in addition to federal requirements. This action would ensure the Oregon Smoke Management Plan continues to comply with federal requirements in the Clean Air Act and is federally enforceable.

What alternatives did DEQ consider if any?
Since this action is necessary to comply with the requirements of the Clean Air Act, DEQ did not consider other options for this proposal.

Land Use

Land-use considerations

In adopting new or amended rules, ORS 197.180 and OAR 340-018-0070 require DEQ to determine whether the proposed rules significantly affect land use. If so, DEQ must explain how the proposed rules comply with statewide land-use planning goals and local acknowledged comprehensive plans.

Under OAR 660-030-0005 and OAR 340 Division 18, DEQ considers that rules affect land use if:

- The statewide land use planning goals specifically refer to the rule or program, or
- The rule or program is reasonably expected to have significant effects on:
    - Resources, objectives or areas identified in the statewide planning goals, or
    - Present or future land uses identified in acknowledged comprehensive plans

To determine whether the proposed rules involve programs or actions that affect land use, DEQ reviewed its Statewide Agency Coordination plan, which describes the DEQ programs that have been determined to significantly affect land use. DEQ considers that its programs specifically relate to the following statewide goals:

Goal	Title
5	Open Spaces, Scenic and Historic Areas, and Natural Resources
6	Air, Water and Land Resources Quality

9 Ocean Resources
11 Public Facilities and Services
16 Estuarial Resources

Statewide goals also specifically reference the following DEQ programs:

- Nonpoint source discharge water quality program – Goal 16
- Water quality and sewage disposal systems – Goal 16
- Water quality permits and oil spill regulations – Goal 19

Determination

DEQ determined that this rulemaking and the proposed revision to the SIP under OAR 340-200-0040 does not affect land use under OAR 340-018-0030 or DEQ's State Agency Coordination Program.

EQC Prior Involvement

DEQ shared information with the commission about this rulemaking through an information item at the Sept. 13-14, 2017, meeting in Bend, the May 11, 2018, meeting in The Dalles, and at the Nov. 15-16, 2018, meeting in Portland.

Advisory Committee

Advisory committee

DEQ did not convene an advisory committee. However, ODF convened the Smoke Management Review Committee. The committee met five times in 2017 and 2018. Both ODF and DEQ relied on this committee for evaluating the smoke management program. Committee recommendations are the basis for the proposed plan amendments. The Committee's primary focus was to review the smoke management policy and ensure program implementation is balanced in achieving the two program goals (ORS 477.552):

> *"To improve the management of prescribed burning as a forest management and protection practice; and*
>
> *To minimize emissions from prescribed burning consistent with the air quality objectives of the federal Clean Air Act and the State of Oregon Clean Air Act Implementation Plan developed by the Department of Environmental Quality."*

The committee included representatives from Oregon local government, public health agencies and associations, Forestry and Forest Industry Associations, US EPA, USFS, BLM, Forest Collaboratives and Conservancy, Oregon Tribes, Lane Regional Air Pollution Authority, a Citizen at Large and the Sierra Club.

Smoke Management Advisory Committee	
Name	**Representing**
Gregory McClarren	Public Rep, SMAC Committee Chair
Dave Cramsey	Industrial Landowner Rep
Scott Hanson	Non-Industrial Landowner Rep
Willie Begay	Bureau of Land Management
Rick Graw	U.S. Forest Service
Kirsten Aird	Oregon Health Authority
Ken Kestner	Lake County Commissioner
Courtney Vanbragt	Klamath County Public Health
Mike McGown	Environmental Protection Agency
Merlyn Hough	Lane Regional Air Protection Agency.
Carrie Nyssen	American Lung Association

John Stromberg	City of Ashland Mayor
David Stowe	The Sierra Club
Bob Palzer	Private Citizen
Mike White	Protection Associations
Amy Patrick	Oregon Forest & Industries Council
Rex Storm	Associated Oregon Loggers
Colin Beck	Coquille Indian Tribe
Pete Caligiuri	The Nature Conservancy
Mark Webb	Forest Collaboratives
Jim James	Oregon Small Woodlands Association
Project Sponsors	
David Collier, until May 1, 2018	DEQ
Michael Orman, April 2018 and onward	DEQ
Doug Grafe	ODF
Project Staff Support	
Name	**Role**
Dan Thorpe	Facilitator
Nick Yonker	ODF Project Manager
Rachel Sakata	DEQ Nonattainment Area Coordinator
Jim Gershbach	ODF Public Affairs
Chrystal Bader	ODF Support
Peter Brewer	DEQ Attainment Area Coordinator

Public Hearing

Public notice

DEQ provided notice of the proposed rulemaking and rulemaking hearings by:

- On July 18, 2018, filing notice with the Oregon Secretary of State for publication in the August 2018 Oregon Bulletin;
- Notifying the EPA by mail;
- Posting the Notice, Invitation to Comment and Draft Rules on the web page for this rulemaking, located at: Smoke Management 2018;
- Emailing approximately 10,529 interested parties on the following DEQ lists through GovDelivery:
    - Rulemaking
    - Smoke 2018
    - Air Quality Maintenance Plans
    - DEQ Public Notices
- Emailing the following key legislators required under ORS 183.335:
    - Senate President Peter Courtney
    - Speaker of the House Tina Kotek
    - Senator Michael Dembrow
    - Representative Ken Helm
    - Representative Brian Clem
- Postings on Twitter and Facebook
- Posting on the DEQ event calendar: DEQ Calendar

Public hearings

DEQ held five public hearings in August 2018. The details of these public hearings are listed below. The public attended the hearings in person or by teleconference.

DEQ considered all written comments received at the hearings listed below. A summary of all comments and DEQ's response to comments is included in this staff report.

Hearing 1	
Date	Aug. 21, 2018
Time	7-8:30 p.m.
Street Address	OSU Extension Service 10507 N. McAlister Rd
City	La Grande, 97850
Presiding Officer	Peter Brewer

Staff Presenter	Michael Orman
Call-in Phone Number	888-278-0296
Participant ID	8040259

Hearing 2	
Date	Aug. 22, 2018
Time	7-8:30 p.m.
Street Address	Deschutes Service Building 1300 NW Wall St Barnes and Sawyer Meeting Room
City	Bend, 97701
Presiding Officer	Peter Brewer
Staff Presenter	Michael Orman
Call-in Phone Number	888-278-0296
Participant ID	8040259

Hearing 3	
Date	Aug. 23, 2018
Time	7-8:30 p.m.
Street Address	Oregon Institute of Technology Campus, CU, Mt Thielsen Room, 3201 Campus Dr.
City	Klamath Falls, 97601
Presiding Officer	Michael Orman
Staff Presenter	Michael Orman
Call-in Phone Number	888-278-0296
Participant ID	8040259

Hearing 4	
Date	Aug. 28, 2018
Time	7-8:30 p.m.
Street Address	Lane Regional Air Protection Agency 165 East 7th Avenue, Suite 100
City	Eugene, 97401
Presiding Officer	Peter Brewer

Staff Presenter	Michael Orman
Call-in Phone Number	888-278-0296
Participant ID	8040259

Hearing 5	
Date	Aug. 29, 2018
Time	7-9:30 p.m.
Street Address	Smullin Health Education Center 2825 E Barnett Rd
City	Medford, 97504
Presiding Officer	Peter Brewer
Staff Presenter	Michael Orman
Call-in Phone Number	888-278-0296
Participant ID	8040259

Summary of Public Comments and DEQ Responses

Public comment period

DEQ accepted public comment on the proposed rulemaking from July 18, 2018, until 5 p.m. on Sept. 14, 2018. ODF changed the proposed rules in response to comments described in the response sections below.

Summary of comments received
The majority of commenters voiced support for the program, with less than 10 percent expressing opposition to such burning. A number of people had various other suggestions for managing slash or conducting pre-burning treatment operations in the woods.

Some commenters pointed out how small overall the emission inventory from prescribed fire is compared with wildfire, and since it is so much better controlled, DEQ should support the activity while still protecting human health.

Others voiced their concern over additional levels of smoke and the expected impacts to human health. Some commenters expressed concern over the additional economic impacts any given area may feel with the addition of smoke in the communities. Yet others expressed that even though they have asthma or breathing problems they do support the proposed rule changes. The full text of comments received, and agency responses, is included as Supporting Document 1, with a summary of comments seen below.

Summary table of stakeholder comments and DEQ responses by primary comment theme

200 total comments (162 written, 38 provided at public hearing)

Primary Comment Theme	Comment/Response #	DEQ Response
Support the Smoke Management Plan without any stated stipulations 74 of 200 responses; **37 percent**	*Written Comments*: 3, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 24, 25, 26, 27, 28, 29, 30, 31, 33, 34, 35, 39, 40, 42, 43, 45, 48, 51, 55, 57, 60, 61, 62, 80, 81, 83, 85, 88, 89, 90, 91, 92, 98, 99, 100, 101, 106, 107, 110, 112, 114, 115, 117, 118, 119, 132, 140, 147, 150, 153	Thank you for your comment.

	Public Hearing Comments: 1, 18, 19, 20, 21, 24, 28, 33	
Support components of the Smoke Management Plan but are concerned with the 1-hour standard and want a clear, simple and attainable process to obtain an exemption from the 1-hour standard 80 of 200 responses; **40 percent**	*Written Comments:* 1, 4, 22, 23, 36, 37, 47, 53, 54, 58, 59, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 93, 95, 97, 102, 108, 111, 113, 120, 123, 124, 128, 129, 130, 133, 134, 135, 139, 141, 142, 144, 145, 146, 151, 154, 155, 156, 157, 158, 160, 162 *Public Hearing Comments*: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 22, 27, 29, 30, 32, 35, 36, 37	The proposed rule language allows for an estimated increase of prescribed fire use by 80 percent. Guiding legislation for the Smoke Management Program directs DEQ and ODF to seek a balance of the use of prescribed fire as a forest management practice, with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to meet that balance. Furthermore, the increased potential for smoke entering communities comes with the increased need for proactive communications about prescribed fires and the potential impacts. The proposed rules require ODF and DEQ to develop a communication framework for prescribed fires to be used throughout Oregon. This framework will include information that the public can use to protect their health.
Against the Smoke Management Plan due to health or environmental concerns associated with increased use of prescribed burning 18 of 200 responses; **nine percent**	*Written Comments*: 21, 38, 41, 44, 49, 52, 56, 86, 121, 122, 126, 127, 136, 143, 152, 159 *Public Hearing Comments*: 31, 38	DEQ agrees that smoke impacts health, no matter the concentration. Guiding legislation for the Smoke Management Program directs DEQ and ODF to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to meet that balance. With the increased potential for smoke entering communities comes the increased need for proactive communications about prescribed fires and their potential impacts. The proposed rules require ODF and DEQ to develop a communication framework for prescribed fires to be used throughout Oregon. This framework will include information that the public can use to protect their health from smoke.
Do not want any regulations limiting the use of prescribed burning	*Written Comments:* 84, 109, 116, 161	Thank you for your comment.

4 of 200 responses; **two percent**		
Request that other strategies be considered to reduce fuel-loads (mulching, grazing, thinning, etc.) Five of 200 responses; **three percent**	*Written Comments:* 9, 32, 104 *Public Hearing Comments*: 23, 25	Thank you for your comment. The existing Smoke Management program seeks to implement alternatives to prescribed fire, but is otherwise outside of the scope of this rulemaking.
Other 15 of 200 responses; **nine percent**	*Written Comment*: 2, 46, 50, 82, 87, 94, 96, 105, 125, 131, 137, 138, 148, 149 *Public Hearing Comments*: 14, 17, 26, 34	Thank you for your comment.

In addition to the primary comment themes, some people commented on the use of polyethylene plastic used as cover over burn piles. Of the 200 respondents, four percent were either against the expanded use of plastic, or wanted more research on kraft paper and two percent in support of expanding the use of polyethylene.

Implementation

Notification

The proposed rules would become effective upon filing on approximately Jan. 25, 2019. DEQ would notify affected parties by:

Public

- Sending a GovDelivery to the Smoke Management topic group
- Filing the rules with the Secretary of State with notice being published in the February 2019 edition of the Secretary of State's Oregon Bulletin

Systems

- Website – Updating DEQ's webpage with the updated Smoke Management Plan

Five-year review

Requirement

Oregon law requires DEQ to review new rules within five years after EQC adopts them. The law also exempts some rules from review. DEQ determined whether the rules described in this report are subject to the five-year review. DEQ based its analysis on the law in effect when EQC adopted these rules.

Exemption from five-year rule review

The Administrative Procedures Act exempts all of the proposed rules from the five-year review because the proposed rules would:

- Amend or repeal an existing rule. ORS 183.405(4).

Draft Rules – With Edits Highlighted

Key to Identifying Changed Text:
~~Strikethrough: Deleted Text~~
Underline: New/inserted text

DEPARTMENT OF ENVIRONMENTAL QUALITY

Division 200
GENERAL AIR POLLUTION PROCEDURES AND DEFINITIONS

340-200-0040
State of Oregon Clean Air Act Implementation Plan

(1) This implementation plan, consisting of Volumes 2 and 3 of the State of Oregon Air Quality Control Program, contains control strategies, rules and standards prepared by DEQ and is adopted as the State Implementation Plan (SIP) of the State of Oregon under the FCAA, 42 U.S.C.A 7401 to 7671q.

(2) Except as provided in section (3), revisions to the SIP will be made under the EQC's rulemaking procedures in OAR 340 division 11 of this chapter and any other requirements contained in the SIP and will be submitted to the EPA for approval. The SIP was last modified by the EQC on ~~November 16, 2018.~~Jan. 24, 2019.

(3) Notwithstanding any other requirement contained in the SIP, DEQ may:

(a) Submit to the EPA any permit condition implementing a rule that is part of the federally-approved SIP as a source-specific SIP revision after DEQ has complied with the public hearings provisions of 40 CFR 51.102; and

(b) Approve the standards submitted by LRAPA if LRAPA adopts verbatim, other than non-substantive differences, any standard that the EQC has adopted, and submit the standards to EPA for approval as a SIP revision.

(4) Revisions to the State of Oregon Clean Air Act Implementation Plan become federally enforceable upon approval by the EPA. If any provision of the federally approved State Implementation Plan conflicts with any provision adopted by the EQC, DEQ must enforce the more stringent provision.

Statutory/Other Authority: ORS 468.020 & 468A
Statutes/Other Implemented: ORS 468A.035 & 468A.135

ODF Draft Rules – With Edits Highlighted

Key to Identifying Changed Text:

Changes made pre-notice:

- ~~Strikethrough: Deleted Text~~
- **Bolded: New/inserted text**

Changes made post-notice:

- ~~Strikethrough: Deleted Text~~
- **Bolded and Underline: New/inserted text**

DIVISION 48

SMOKE MANAGEMENT

629-048-0001

Title, Scope and Effective Dates

(1) OAR 629-048-0001 through 629-048-0500 are known as the Smoke Management rules.

(2) The Smoke Management rules apply to prescribed burning of forest fuels for forest management purposes within any forest protection district in Oregon as described by OAR 629-041-0500 to 629-041-0575. ~~In addition, the rules apply to forestland outside any forest protection district in Oregon as described by ORS 527.620(7) at the discretion of the Oregon Department of Forestry and Department of Environmental Quality defined in a joint agreement.~~

(3) The Smoke Management rules are effective ~~July 11, 2014~~ **March 1, 2019**.

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0005

Definitions

Unless otherwise defined below, terms used in this rule division shall have the meaning provided in ORS 477.001:

(1) “Alternatives to burning” means any forest management activity that reduces the volume of material, rather than actually being burned.

(2) “Board” means the State Board of Forestry.

(3) “Burn boss” means the person, authorized by the owner (may include the owner) or a federal land management agency to conduct and make decisions regarding the practices involved in conducting a prescribed burning operation and who is responsible for compliance with all requirements under this rule division and related laws.

(4) “Burn registration” means the act or product of notifying the forester to the required level of detail, of intent to conduct a prescribed burning operation as required by OAR 629-048-0300.

(5) “Class I Area” means national parks and certain wilderness areas designated by Congress in 1977 as federal Class I Areas that are subject to visibility protection under the Environmental Protection Agency’s Regional Haze Rule and the federal Clean Air Act. Class I Areas in Oregon include: Crater Lake National Park, Diamond Peak Wilderness, Eagle Cap Wilderness, Gearhart Mountain Wilderness, Hells Canyon Wilderness, Kalmiopsis Wilderness, Mountain Lakes Wilderness, Mount Hood Wilderness, Mount Jefferson Wilderness, Mount Washington Wilderness, Strawberry Mountain Wilderness and Three Sisters Wilderness.

(6) “Class 1 forestland” has the same meaning as given in ORS 526.324 to “timber class” and includes all forestland primarily suitable for the production of timber.

(7) “Class 2 forestland” has the same meaning as given in ORS 526.324 to “timber and grazing class” and includes all forestland primarily suitable for joint use for timber production and the grazing of livestock, as a permanent or semi-permanent joint use, or as a temporary joint use during the interim between logging and reforestation.

(8) “Class 3 forestland” has the same meaning as given in ORS 526.324 to “agricultural class” and includes all forestland primarily suitable for grazing or other agricultural use.

(9) “Department” means the ~~State Forestry Department~~ **Oregon Department of Forestry (ODF)**.

(10) “Eastern Oregon” means the eighteen Oregon counties lying east of Multnomah, Clackamas, Marion, Linn, Lane, Douglas, and Jackson Counties.

(11) “Emission reduction technique” means any forest management activity that allows for a lower volume of particulate to be produced from a given volume of burning.

(12) “Emissions” means the gaseous and particulate combustion products in smoke resulting from burning forest fuels.

(13) “Federal land management agency” means the United States Department of Agriculture’s Forest Service; the United States Department of the Interior’s Bureau of Land Management, National Park Service, United States Fish and Wildlife Service, or Bureau of Indian Affairs; or any other federal agency that may conduct prescribed burning within a forest protection district.

(14) “Field administrator” means an **ODF** employee ~~of the State Forestry Department~~, a forest protective association, or federal land management agency who has, among other responsibilities, an official role in determining whether a prescribed burn should proceed, continue or be suspended.

(15) “Forester” means the State Forester or authorized representative including but not limited to fire wardens appointed under ORS 477.355.

(16) “Forest fuels” means any flammable woody material, grass or other plant matter that may constitute a wildfire hazard or that is intended for disposal by prescribed burning, but does not include products that have had secondary processing such as boards, posts or paper.

(17) “Forest protection district” means an area of forestland designated by the State Forester for protection from fire pursuant to ORS 477.225. Detailed descriptions of the forest protection districts may be found in OAR 629-041-0500 to 629-041-0575.

(18) “Ground level” means at or close to the surface of the earth such that smoke at “ground level” could be inhaled by persons going about their normal business, in or out of doors. It does not include smoke that passes overhead when prescribed burning is conducted in accordance with the Smoke Management forecast and instructions.

(19) “Level 1 regulation” means the program of requirements that apply to all forestland managed by a federal land management agency statewide, and all Class 1 forestland in western Oregon within a forest protection district (OAR 629-048-0100(2). These requirements include burn registration at least seven days in advance (OAR 629-048-0300), fee administration (OAR 629-048-0310), compliance with Smoke Management forecast instructions (OAR 629-048-0230), and reporting of accomplishments (OAR 629-048-0320).

(20) “Level 2 regulation” means the program of requirements that apply to all non-federal forestlands in eastern Oregon, and all Class 3 forestland in western Oregon within a forest protection district (OAR 629-048-0100(3). These requirements include burn registration (OAR 629-048-0300) and reporting of accomplishments (OAR 629-048-0320).

(21) “Mop-up” means action, usually involving the application of water or other means to eliminate heat, remove fuel or reduce the supply of oxygen, sufficient to make a fire safe or reduce residual smoke.

(22) “Other areas sensitive to smoke” means specific recreation areas not listed as SSRAs in OAR 629-048-0140 but that are intended to receive consideration for focused forecasting

attention for limited times during periods of heavy use by the public such as coastal beaches on holidays and other areas during special events.

(23) "Prescribed burning" means the use of fire ignited as a planned management activity on forestland to meet specific objectives involving the reduction or removal of forest fuels. Prescribed burning does not include impromptu fires ignited for purposes such as warming fires, burn-out or backfire operations used in wildfire suppression, or lightning ignited "wildland fire use" as practiced by federal land management agencies.

(24) "Regional haze" means air pollution transported over long distances into Class I Areas that reduces visibility in those areas.

(25) "Residual smoke" means smoke produced after the initial fire has passed through the fuel.

(~~28~~**26**) "Smoke Sensitive Receptor Area or SSRA" means an area designated for the highest level of protection under the Smoke Management Plan, as described and listed in OAR 629-048-0140.

(~~26~~**27**) "Smoke intrusion" means the verified entrance of smoke from prescribed burning into a**n** ~~Smoke Sensitive Receptor Area~~ **SSRA** at ground level **that** ~~**meets or exceeds**~~**averages at or above 70 micrograms per cubic meter of particulate matter of 2.5 microns or less (PM2.5) for any one-hour period and/or averages at or above 26 micrograms per cubic meter for a 24-hour period, measured from midnight to midnight** ~~**beginning on the first day of smoke entrance**~~.

(28) "Smoke incident" means the verified entrance of smoke from prescribed burning into an SSRA, other areas sensitive to smoke, or a community other than an SSRA at levels below a smoke intrusion (see "Smoke intrusion" definition~~**), other areas sensitive to smoke, or a community other than an SSRA**~~**.**

(~~27~~**29**) "Smoke Management forecast unit" means any or all of the persons appointed or assigned by the State Forester to develop and interpret weather forecasts and produce Smoke Management instructions, usually operating from the department headquarters in Salem.

(~~29~~**30**) "Underburning" means low-intensity prescribed burning to maintain forest health through reduction of fuels in the understory of a forest stand while maintaining the overstory stand characteristics.

(31) "Vulnerable populations" means people with specific sensitivities including, but not limited to, those with heart diseases, coronary artery disease, congestive heart failure, or those with lung and respiratory diseases, such as chronic obstructive pulmonary disease (COPD), and those with asthma, older adults, pregnant women, and children.

~~(30) "Verified smoke incident" means an entrance of prescribed burning smoke into a community, other than an SSRA, investigated by the forester to:~~

~~(a) Validate claims that smoke did, in fact, enter the area described, at ground level;~~

~~(b) Determine if the smoke or a portion of it, in fact, derived from forest management prescribed burning from a legally conducted operation; and~~

~~(c) If (a) and (b) of this section were affirmed, determine the intensity and approximate duration of the smoke incident as described in OAR 629-048-0110.~~

(~~31~~32) "Western Oregon" means the eighteen Oregon counties lying west of Hood River, Wasco, Jefferson, Deschutes and Klamath Counties.

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0010

Purpose

(1) ORS 477.013 requires the State Forester and the Department of Environmental Quality **(DEQ)** to approve a plan for managing smoke in areas that they are to designate, for the purpose of maintaining air quality. The plan must designate areas within which all burning must comply with the plan.

(2) The Smoke Management rules are intended to establish the areas required by ORS 477.013; describe the objectives of the Smoke Management Plan; establish procedures to be followed in administering prescribed burning; educate the public as to the necessity of prescribed burning and the measures being taken to protect air quality, public health and visibility; and to provide enforceable mechanisms to ensure the requirements of the Smoke Management Plan are met.

(3) The Smoke Management rules, promulgated by the State Forester, together with Department Directive 1-4-1-601, "Operational Guidance for the Oregon Smoke Management Program," shall comprise the Smoke Management Plan upon approval by DEQ and filing with the Secretary of State.

(4) The objectives of the Smoke Management Plan are to:

(a) ~~Prevent~~ **Minimize** smoke **emissions** resulting from prescribed burning **as described by ORS 477.552;** ~~on forestlands from being carried to or accumulating in SSRAs or other areas sensitive to smoke, and to provide maximum opportunity for essential forestland burning while minimizing emissions;~~

(b) Provide maximum opportunity for essential forestland burning;

(**c**) Protect public health **by avoiding intrusions**;

(~~b~~**d**) Coordinate with other state smoke management programs;

(~~c~~**e**) Comply with state and federal air quality and visibility requirements; and

~~(d) Protect public health; and~~

(~~e~~**f**) Promote the ~~reduction of~~ **further development of techniques to minimize** **or reduce** emissions by encouraging cost-effective utilization of forestland biomass, alternatives to burning and ~~alternative burning practices~~ **emission reduction techniques**.

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0020

Necessity of Prescribed Burning

(1) ~~All of Oregon's forestlands are flammable~~ ~~**can burn**~~ ~~under the right conditions of fuel dryness, heat and wind.~~ **ORS 477.005 declares that the public policy of the State of Oregon is to preserve forests "through the prevention and suppression of forest fires." Prescribed burning is an important tool used to reduce forest fuels, re-introduce fire on the landscape, and has been demonstrated to reduce the potential for a fire to start or reduce its severity. It has also been demonstrated that fire suppression actions are more effective and lower in cost in areas with a recent history of burning.**

(2) As a part of the natural ecology of forestlands, wildfire is neither necessarily good nor bad. **In fire-dependent ecosystems, frequent wildfire serves to limit spread of subsequent fires.** However, there are a number of **undesirable** characteristics of unplanned, uncontrolled fires ~~that are usually regarded by humans as undesirable~~. Among these are threats to public safety, destruction of **natural resources and** property, and the adverse health effects that can occur from breathing a significant amount of fine particulate matter associated with wildfire smoke.

(3) When areas do not experience fire or other means of reducing forest fuels for extended periods, ~~there is a greater~~ wildfire hazard ~~and~~ **increases**. **The** ~~the~~ likelihood increases ~~that~~ if unplanned ignitions occur, through whatever means, ~~that~~ the resulting wildfire will burn at greater intensity and be more difficult to suppress.

(4) Because wildfires typically burn during hotter, drier conditions than those usually planned for prescribed fires, forest fuels are more completely consumed, producing more emissions. Also, wildfires often occur during periods of atmospheric stability, ~~and thus air~~

~~stagnation~~ trapping smoke close to the ground where it's more likely to impact humans. ~~and less likely to be quickly carried away by higher altitude transport winds.~~

(5) Prescribed burning is ~~used as a management **tool** technique to reduce forest fuels either as the primary mechanism such as in grass and brush areas for maintenance of grazing, and underburning of open forest stands for forest health purposes; or as a secondary fuel reduction method following thinning or final harvesting~~ **an important forest management technique in all of Oregon's forests to reduce forest fuels for the purposes of both short term and long term fire prevention and to aid in fire suppression.** ~~It~~ **Prescribed burning** is typically conducted ~~at a time and under fuel and~~ **when** weather conditions ~~whereby the~~ **allow** fine fuels ~~that more~~ **to** readily ignite ~~and carry fire across the landscape are consumed but the~~ **while** larger fuels are consumed to a lesser degree than in ~~a~~ wildfire. Resulting emissions are ~~both~~ reduced ~~overall,~~ and ~~more likely carried into higher altitudes and~~ dissipate~~d by high level winds, away from concentrations of people.~~ quickly, before affecting populated areas.

(6) When ~~adequate~~ forest fuel reduction can be achieved economically without ~~the use of~~ using prescribed burning, ~~because of other fire associated risks,~~ that choice is usually favored. Even so, there are often silvicultural or agricultural advantages to prescribed burning such as site preparation, nutrient cycling and reduction of pests and disease that may not be achieved by simply removing the forest fuels. For all these reasons described above, the Legislative Assembly (ORS 477.552) and Board of Forestry have found it necessary to maintain ~~the viability of~~ prescribed burning as a forest management practice.

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0021

Necessity of Safeguarding Public Health

(1) Excessive smoke, no matter its source, can pose a serious health risk to the public, especially vulnerable populations.

(2) To help minimize the health risks to the public from prescribed burning, the program encourages prescribed burning emissions be minimized and smoke intrusions be avoided.

629-048-0100

Regulated Areas

(1) All lands classified as "forestland" under ORS 526.305 to 526.370 and all forestland managed by a federal agency regardless of whether or not classified, within a forest protection district, are subject to regulation of prescribed burning pursuant to ORS 477.013.

The level of regulation may vary according to specific classification; e.g., Class 1, 2 or 3 forestland as described in ORS 526.305 to 526.370.

(2) Class 1 forestland in western Oregon, and all forestland managed by a federal land management agency statewide, within a forest protection district, is subject to burn registration at least seven days in advance (OAR 629-048-0300), fee administration (OAR 629-048-0310), compliance with Smoke Management forecast instructions (OAR 629-048-0230), and reporting of accomplishments (OAR 629-048-0320). The forestlands and applicable regulations listed in this section may be referred to as "Level 1 regulation."

(3) All other non-federal forestland within a forest protection district, including, but not limited to, private forestlands in eastern Oregon and Class 3 private forestland in western Oregon is subject to burn registration (OAR 629-048-0300) and reporting of accomplishments (OAR 629-048-0320) but is not subject to fee administration or compliance with smoke management forecast instructions. The forestlands and applicable regulations listed in this section may be referred to as "Level 2 regulation."

(4) All prescribed burning on forestland within a forest protection district is subject to suspension of burning by the forester under ORS 477.520 due to conditions such as air stagnation or fire danger.

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0110

~~**Characterization of Smoke Incidents or Intrusions**~~ **Characterization and Response to Smoke Incidents, Smoke Intrusions, and National Ambient Air Quality Standards (NAAQS) Exceedances**

(1)(a) When investigating or collecting information on smoke incidents or **smoke** intrusions, the department will attempt to characterize the ~~incident or intrusion in terms of its intensity (light, moderate or heavy) and duration in hours or minutes.~~ ~~event~~ **impact** **as either a smoke intrusion or a smoke incident as defined in OAR 629-048-0005.** ~~To the extent it can reasonably do so, the department may also attempt to determine the amount of populated area affected (in square miles or acres) and an estimate of the number of people present during the incident or intrusion.~~

(b) As used in the Smoke Management rules, "smoke intrusion" refers only to ground level prescribed burning smoke that enters an SSRA at ~~ground level.~~ **particulate matter values defined in OAR 629-048-0005(27)**. ~~Nonetheless, the methods and descriptions described in this rule may be applied to the measurement of any smoke incident relevant to the Smoke Management Plan.~~

(2) When measurements or observations are available, **smoke** incidents or **smoke** intrusions are characterized ~~in the following manner~~ based on ~~nephelometer~~ **particulate matter** values ~~(averaged~~ over a one-hour **average** period, **or a 24-hour average period**~~)~~ ~~above the clean air background:~~ **from midnight to midnight** ~~beginning on the first day of smoke entrance~~**.**

~~(a) A light intensity incident or intrusion is characterized by light scattering measurement of less than 1.8 x 10-4 B-scat (Beta scatter);~~

~~(b) A moderate intensity incident or intrusion is characterized by a light scattering measurement of greater than or equal to 1.8 x 10-4 B-scat but less than or equal to 4.9 x 10-4 B-scat; and~~

~~(c) A heavy intensity incident or intrusion is characterized by a light scattering measurement of greater than 4.9 x 10-4 B-scat.~~

~~(3) The clean air background is the average nephelometer reading for the three hours prior to the incident or intrusion.~~

~~(4) When no nephelometer data are available, incident or intrusion intensity is characterized based on reduction in visibility (also averaged over a one hour period) using standard National Weather Service visibility observation criteria and a table of reductions keyed to various background visibility levels as displayed in department Directive 1-4-1-601, "Operational Guidance for the Oregon Smoke Management Program." As an example, on a day when background visibility has been greater than 50 miles, a light intensity incident or intrusion has reduced visibility to greater than or equal to 11.4 miles; a moderate intensity incident or intrusion has reduced visibility to less than 11.4 miles, but greater than or equal to 4.6 miles; and a heavy intensity incident or intrusion has reduced visibility to less than 4.6 miles.~~

(3) When no particulate matter data ~~is~~ are available, smoke incidents or smoke intrusions are determined based on reduction in visibility averaged over a one-hour period using standard National Weather Service visibility observation criteria (Federal Meteorological Handbook No. 1) and a table of reductions keyed to various background visibility levels as displayed in Department Directive 1-4-1-601, "Operational Guidance for the Oregon Smoke Management Program."

(4) Smoke incidents and smoke intrusions will be documented and used to assess annual program performance. Department Directive 1-4-1-601 "Operational Guidance for the Oregon Smoke Management Program" will describe applicable reporting requirements and actions to be taken.

(5) Smoke intrusions that ~~meet or exceed~~average at or above the 24-hour average PM2.5 value of 35 microgram per cubic meter (NAAQS exceedance) will be reported to DEQ as soon as possible. Department Directive 1-4-1-601 "Operational Guidance for

the Oregon Smoke Management Program" will describe applicable reporting requirements and adaptive management actions to be taken if this event occurs.

[ED. NOTE: Department Directive 1-4-1-601 "Operational Guidance for the Oregon Smoke Management Program." is available online at: http://www.oregon.gov/ODF/Documents/Fire/smd.pdf]

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0120

Air Quality Maintenance Objectives

(1) When prescribed burning is conducted **near** ~~in proximity to~~, but outside communities or areas designated as SSRAs, the objective of the Smoke Management Plan is ~~no~~ **to minimize emissions and avoid** smoke intrusions into the SSRA.

(2) When prescribed burning is conducted inside an SSRA, the Smoke Management Plan objective is to use best burn practices and prompt mop-up, as appropriate, along with tight parameters for burn-site conditions that are intended to vent the main smoke plume up and out of the SSRA and minimize residual smoke.

(3) In all other instances of prescribed burning it is the intent under the Smoke Management Plan to minimize the amount and duration of smoke that comes in contact with humans ~~at their places of residence or other places~~ where they ~~normally~~ **live, work**~~, play, exercise~~ **or** gather in ~~numbers such as to work, conduct commerce or participate in~~ public ~~events~~.

(4) The first element in minimizing smoke contact is encouraging forestland owners to burn only those units which cannot otherwise meet forest management objectives in cost-effective alternative ways such as wood or biomass utilization.

(5) When prescribed burning is used, owners are further encouraged to employ the emission reduction techniques described in OAR 629-048-0210 to ensure the least emissions practicable.

(6) In addition to compliance with Smoke Management instructions issued in the daily forecast and compliance with all conditions of the burn permit required under ORS 477.515, burn bosses and field administrators are encouraged to closely observe local conditions at the burn site ~~and to light, manage,~~. **They should alter or** suspend lighting if necessary, and mop-up burns, when appropriate, in a manner that takes into consideration the possible smoke effects from the main smoke plume or significant residual smoke on residences or businesses that may be **near** ~~in close proximity to~~ the burn site.

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0130

Visibility Objectives

(1) It is the intent under the Smoke Management Plan to comply with the Oregon Visibility Protection Plan (OAR 340-200-0040, Section 5.2).

(2) It is the intent under the Smoke Management Plan to operate in a manner consistent with the Oregon Regional Haze Plan, including the Enhanced Smoke Management Program (ESMP) criteria contained in the plan, for the purpose of protecting Class I Area visibility. These ESMP criteria include:

(a) Actions to minimize emissions;

(b) Evaluation of smoke dispersion;

(c) Alternatives to fire;

(d) Public notification;

(e) Air quality monitoring;

(f) Surveillance and enforcement;

(g) Program evaluation;

(h) Burn authorization; and

(i) Regional coordination.

(3) When prescribed burning is conducted outside any Class I Area, an objective of the Smoke Management Plan is to minimize any smoke that impairs visibility inside the Class I Area. In addition to compliance with Smoke Management instructions issued in the daily forecast and compliance with all conditions of the burn permit required under ORS 477.515, burn bosses and field administrators are encouraged to closely observe local conditions at the burn site to avoid the main smoke plume entering a Class I Area at ground level.

(4) When prescribed burning is conducted inside a Class I Area, the Smoke Management Plan objective is to use best practices along with tight parameters for burn-site conditions that will vent the main smoke plume up and out of the Class I Area and minimize residual smoke.

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0135

Special Protection Zone Requirements

Special Protection Zones (SPZ) have been established around certain communities (see maps located within Department Directive 1-4-1-601, "Operational Guidance for the Oregon Smoke Management Program, Appendix 5) requiring additional protection from particulates. Any burning in an SPZ, during its protection period, must have the approval of the meteorologist. These SPZ provisions apply from November 15 through February 15 to the following communities which are particulate matter (PM) nonattainment ~~and~~ or maintenance areas: Klamath Falls, Medford, Oakridge, and Lakeview.

(1) From November 15 through February 15, prescribed burning in the SPZ is allowed on "Green" and "Yellow" woodstove days (see OAR 340-262-0800 and local ordinances for communities listed above) if:

(a) The ODF Smoke Management meteorologist believes ~~there will be minimal measurable~~ smoke impacts will not exceed smoke intrusion levels.

(b) Landowners are responsible for intermittent monitoring for at least three days following ignition to ensure the smoke is not causing an impact that could exceed smoke intrusion levels. ODF can waive this provision if it believes monitoring is unnecessary on a specific burn unit due to limited smoke production.

(c) Landowners provide a level of mop-up, as directed by ODF, to minimize smoke impacts to levels below a smoke intrusion. Mop-up shall be included as an element of the burn plan.

~~(d) ODF believes that piles will not produce significant smoke after the third day.~~

(2) From December 1 through February 15, no prescribed burning is allowed on "Red" woodstove days in the SPZ. Prescribed burning on "Red" days from November 15 through 30 is allowed and subject to the same conditions for "Green" and "Yellow" days as described in section 1(a-~~d~~c) of this rule.

~~(3) Burning should be prioritized so units that are smaller and/or further from the SPZ boundary have higher priority to burn than units larger and/or closer to the SPZ boundary.~~

(43) Districts and Forests having jurisdiction in any SPZ will be responsible for monitoring restrictions in the nonattainment or maintenance area as described in section 1 and 2 of this rule.

(~~5~~4) SPZ provisions shall apply as long as the area is in PM nonattainment or is in maintenance of the PM standard. An SPZ shall be developed by DEQ or Lane Regional Air Protection Agency (LRAPA) for any newly declared PM nonattainment area, in consultation with ODF. For areas declared nonattainment from January 1 through May 31, the new SPZ requirements shall become effective on November 15 in the year the area is declared nonattainment. If the area is declared nonattainment from June 1 through December 31, the new SPZ shall be effective on November 15 of the following year.

629-048-0137

SPZ Contingency Plan Requirements

In the event communities listed in OAR 629-048-0135~~; as well as Eugene/Springfield, Grants Pass, and La Grande maintenance areas;~~ exceed the 24-hour average PM2.5 National Ambient Air Quality Standard value of 35 micrograms per cubic meter during the SPZ provision period and prescribed burning is determined to be a ~~significant~~ contributor using verification methods to include, but not limited to: ground, aerial, or equipment monitoring, the following contingency plan requirements shall be implemented:

(1) The SPZ boundary will be expanded to include the area from which prescribed burning could impact the PM nonattainment or maintenance area. Any boundary change will be jointly agreed to by ODF and DEQ.

(2) SPZ restrictions will apply from November 1 through March 1~~, except for Klamath Falls where they will apply from November 1 through April 1~~.

(3) The SPZ for Klamath Falls and Lakeview, as well as all future PM nonattainment or maintenance areas in areas of level 2 regulation under the Oregon Smoke Management program, shall be subject to burning reporting requirements of Level 1 regulation during the time when the SPZ is in effect.

(4) ODF and DEQ will take adaptive management steps described in OAR 629-048-0110(5).

[ED. NOTE: Language in OAR 629-048-0135 and 0137 was previously in the Department Directive 1-4-1-601 "Operational Guidance for the Oregon Smoke Management Program."]

629-048-0140

Smoke Sensitive Receptor Areas

An SSRA is an area designated by the board, in consultation with DEQ, which is provided the highest level of protection under the Smoke Management Plan ~~because of~~. **This is due to** its past history of smoke incidents, density of population or other special legal status

related to visibility such as the Columbia River Gorge Scenic Area. The following are SSRAs:

(1) The area within the State of Oregon commonly understood to be the Willamette Valley that:

(a) Lies east of the forest protection district boundaries of the Northwest Oregon, West Oregon and Western Lane Forest Protection Districts, west of the forest protection district boundaries of the North Cascade and South Cascade Forest Protection Districts and north of where the Western Lane and South Cascade Forest Protection Districts come together in southern Lane County (for detailed district boundary descriptions, see OAR 629-041-0500 to 629-041-0575);

(b) Notwithstanding the actual location of the forest protection district boundaries, includes the area within the city limits of the following cities that straddle, or are within but immediately adjoin, the forest protection district boundary:

(A) Carlton;

(B) Corvallis;

(C) Cottage Grove;

(D) Dallas

(E) Eugene;

(F) McMinnville;

(G) Portland;

(H) Sheridan;

(I) Silverton;

(J) Springfield;

(K) St. Helens;

(L) Stayton;

(M) Sublimity;

(N) Veneta;

(O) Willamina; and

(P) Yamhill;

(2) Within the acknowledged urban growth boundaries of the following cities:

(a) Astoria;

(b) Baker City;

(c) Bend;

(d) Burns;

(e) Coos Bay;

(f) Enterprise;

(g) Grants Pass;

(h) John Day;

(i) Klamath Falls;

(j) La Grande;

(k) Lakeview;

(l) Lincoln City;

(m) Newport;

(n) North Bend;

(o) Oakridge;

(p) Pendleton;

(q) Redmond;

(r) Roseburg;

(s) The Dalles; and

(t) Tillamook;

(3) The area within the Bear Creek and Rogue River Valleys described in OAR 629-048-0160, including the cities of Ashland, Central Point, Eagle Point, Jacksonville, Medford, Phoenix and Talent; and

(4) The area within the Columbia River Gorge Scenic Area, as described in 16 U.S.C. Section 544b, (2003).

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0150

Criteria for Future Listing of Smoke Sensitive Receptor Areas

To ensure continued accomplishment of the Smoke Management Plan objectives, additional SSRAs may be listed according to the following procedures:

(1) Not more than once per calendar year, the board must consider additional SSRA listings if:

(a) **ODF** ~~The department~~ recommends consideration of a community for SSRA listing based on observations of repeated ~~verified~~ smoke incidents as described in section (5) of this rule;

(b) **DEQ** ~~The Department of Environmental Quality~~ recommends consideration of a community for SSRA listing based on evidence of airborne particulate concentrations in the community at levels that make periodic ~~exceedance of ambient air quality standards~~ **NAAQS exceedances** a significant possibility; or

(c) The governing body of a city, or county for an unincorporated area, requests by official action consideration of a community for SSRA listing, and cites the reasons for its request upon:

(A) The occurrence of a ~~verified~~ smoke incident **as described in section (5) of this rule** lasting more than four hours;

(B) ~~More than one~~**Repeated** ~~verified~~ smoke incident**s as described in section (5) of this rule** in the same calendar year; or

~~(C) Repeated verified smoke incidents as described in section (5) of this rule that have occurred within the five years immediately preceding the request.~~

(2) When considering whether to list a community as an SSRA, the board shall evaluate the evidence presented to it, including any information received at one or more public meetings.

(a) Specifically, the board shall consider information regarding:

(A) The frequency, duration and ~~intensity~~ **magnitude** of ~~verified~~ smoke incidents;

(B) Population of the community;

(C) The results, if any, of mechanical or systematic monitoring of airborne particulate concentrations, or other verifiable information regarding existing air quality problems in the community under consideration;

(D) The nature and performance of any local programs addressing airborne particulate concentrations;

(E) Recent trends in, and future plans for, prescribed burning activity on surrounding forestlands;

(F) Any local topographic or meteorological effects that may influence the frequency, duration or ~~intensity~~ **magnitude** of smoke incidents;

(G) Evaluation of the local and regional effect that listing the community as an SSRA will have on the Smoke Management Plan's objectives of maintaining air quality and accomplishing necessary prescribed burning;

(H) The reasons cited in a request received under subsection (1)(c) of this rule;

(I) The joint recommendations of the department and DEQ regarding whether the community should be listed and why; and

(J) Any other information that is relevant to accomplishing the objectives of the Smoke Management Plan.

(b) If joint recommendations are not achieved under paragraph (2)(a)(I) above, the department shall prepare a report for the board detailing any differences in recommendations and its explanations for the differences.

(3) After considering the evidence presented to it, except as provided in section (4) of this rule, the board may take any one of the following actions:

(a) Reject the recommendation or request;

(b) Acknowledge that smoke incidents have occurred, but direct the department to pursue an alternate course of further information gathering, monitoring, operational modifications or other efforts aimed at reducing the likelihood of continuing smoke incidents; or

(c) Accept the recommendation or request by defining the applicable boundaries of the community to be listed, directing the department to begin treating the community as an SSRA and following a timely process to amend OAR 629-048-0140 accordingly.

(4)(a) The board's choice of actions shall be limited to those described in either subsections (b) or (c) of this section, if it finds that all of the following circumstances exist:

(A) The community proposed for listing has incurred repeated ~~verified~~ smoke incidents as described in section (5) of this rule, that have occurred within the five years immediately preceding the request or recommendation in section (1) above;

(B) The community is a city with a population in excess of 10,000 within the incorporated city limits, according to the most recently published population estimate of the Population Research Center, Portland State University; and

(C) There is a likelihood of continuing frequent use of prescribed burning as a forest management activity on forestland within 30 miles of the city limits.

(b) For communities with no air quality monitoring data, the board may delay a final action determining whether to list the community as an SSRA if monitoring equipment is installed in the community to gather information leading to a final determination; or

(c) The board may define the applicable boundaries of the community to be listed, direct the department to begin treating the community as an SSRA and follow a timely process to amend OAR 629-048-0140 accordingly.

(5) "Repeated ~~verified~~ smoke incidents" as used in this rule refers to ~~any of the following combinations of verified smoke incidents resulting from lawfully conducted prescribed burning on forestland in any continuous period of three years or less:~~ **two or more smoke incidents that meet or exceed the level of a smoke intrusion in one calendar year.**

~~(a) One heavy intensity smoke incident and one moderate or light intensity smoke incident, the latter lasting at least one hour;~~

~~(b) Two moderate intensity smoke incidents, both lasting at least one hour; or~~

~~(c) Three or more smoke incidents of any combination of intensity for a combined duration of at least three hours (using the intensity parameters described in OAR 629-048-0110 for all of the above).~~

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0160

Bear Creek/Rogue River Valley SSRA

The Bear Creek and Rogue River Valley smoke sensitive receptor area listed in OAR 629-048-0140 (3) is defined as beginning at a point approximately one mile NE of the town of

Eagle Point, Jackson County, Oregon, at the NE corner of Section 36, T35S, R1W; thence south along the Willamette Meridian to the SE corner of Section 25, T37S, R1W; thence SE to the SE corner of Section 9, 39S, R2E; thence SSE to the SE corner of Section 22, T39S, R2E; thence south to the SE corner of Section 27, T39S, R2E; thence SW to the SE corner of Section 33, T39S, R2E; thence west to the SW corner of Section 31, T39S, R2E; thence NW to the NW corner of Section 36, T39S, R1E; thence west to the SW corner of Section 26, T39S, R1E; thence NW to the SE corner of Section 7, T39S, R1E; thence west to the SW corner of Section 12, T39S, R1W; thence NW to the SW corner of Section 20, T38S, R1W; thence west to the SW corner of Section 24, T38S, R2W; thence NW to the SW corner of Section 4, T38S, R2W; thence west to the SW corner of Section 5, T38S, R2W; thence NW to the SW corner of Section 31, T37S, R2W; thence north to the Rogue River, thence north and east along the Rogue River to the north boundary of Section 32, T35S, R1W; thence east to the point of beginning.

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0180

Communication, Community Response Plans, and Exemption Requests

(1) ODF Salem headquarters office shall develop and distribute a best-practices communication framework for dissemination through local ODF and federal district offices to their respective local public health authority. The communications framework shall include general information regarding: ~~(1) the purpose and importance of prescribed burning, (2) the health risks of wildfire and prescribed fire smoke, (3) how local officials and the public can find out about daily burn plans and emission reduction actions in their area, and (4) notification of smoke anticipated entering into specific SSRAs.~~

(a) The purpose and importance of prescribed burning,

(b) The health risks of wildfire and prescribed fire smoke,

(c) Recommendations for the public and vulnerable populations to reduce their exposure to smoke,

(d) How local officials and the public can find out about current and upcoming prescribed burns planned in their area, and

(e) How residents of an SSRA and other interested persons can get up-to-date information about anticipated smoke impacts in specific SSRAs.

(2) ODF and DEQ recommend ~~that~~ communities that are SSRAs ~~which~~ and have experienced repeated smoke incidents and/or intrusions in the past collaboratively

develop a community response plan and program. ~~This plan shall be in coordination with local ODF or federal district offices with jurisdictional responsibilities for prescribed burns, to determine how an SSRA will respond when notified of a potential smoke incident or intrusion into their area.~~

(a) The information in the plan and program includes, but is not limited to the following:

~~(a) The community response plan should be coordinated through the local public health authority but developed collaboratively with input from community officials, agencies, businesses, and other interested parties.~~

(A) A description of populations in an SSRA community that are vulnerable to the health effects of short-term smoke;

(B) 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;

(C) Adequate options for protecting the health of vulnerable populations (or helping such populations to protect themselves) from short-term exposure to smoke; and

(D) 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.

(b) The community response **plan** ~~shall include education about prescribed burning for local residents so they understand potential health impacts from smoke and what steps they can take to reduce their risk of exposure. The plan shall also outline how the community will be alerted whenever smoke from prescribed burning appears likely to impact it, and what local agencies can do to protect community residents, especially vulnerable populations~~ should be coordinated through the local public health authority, but developed collaboratively with members or representatives of vulnerable populations, community officials, representatives from entities that have responsibility for prescribed fire, forest restoration collaborative groups, local businesses, and other interested members of the public.

(c) The plan shall include a public communication and education strategy as outlined in the communication framework in (1).

(3) SSRA ~~Communities~~ communities **that develop and implement such a plan**~~, which proactively alert the public of likely prescribed fire smoke impacts (as described above) and provide actions to mitigate exposure to vulnerable populations and support citizens who may not have the means to take mitigation efforts may request an exemption from the one-hour smoke intrusion threshold. This exemption is intended to provide maximum opportunity for essential forestland burning in the Wildland Urban~~

~~Interface where wildfire risk to forests, communities, and firefighters is greatest. The request for exemption must be approved by the community's local governing body in coordination with the County Board of Commissioners. The request for exemption will be considered for approval by ODF and DEQ under the advisement of Oregon Health Authority~~ that meets the criteria outlined in (2) may request an exemption from the one-hour average smoke intrusion threshold. An exemption to the one-hour smoke intrusion threshold means that smoke impacts that surpass the one-hour threshold, but not the 24-hour average threshold, shall be deemed smoke incidents, not smoke intrusions, in the SSRA.

(a) The request for exemption must be made by the community's local governing body in coordination with their County Board of Commissioners.

(b) The request for exemption will be considered for approval by ODF and DEQ under the advisement of Oregon Health Authority. The exemption shall be granted within 30 days of submission unless ODF and DEQ agree that the plan does not comply with the criteria in (2).

(c) If ODF and DEQ determine the plan does not comply with the above criteria, they shall, within 30 days of submission, provide a written explanation of the reasons for denial.

(d) ODF and DEQ may revoke the exemption if there are repeated (three or more in five years) smoke intrusions that exceed the 24-hour average threshold or prescribed burning contributes to two or more NAAQS exceedances.

(e) ODF and DEQ will revoke the exemption if the SSRA is within one exceedance of a NAAQS violation. SSRAs that are in a NAAQS violation (nonattainment) will not be eligible for an exemption.

(f) In addition, SSRAs that have received an exemption must demonstrate they are implementing their community response plan through an annual report provided by the local health authority detailing:

(A) Compliance with requirements in (2);

(B) A summary of methods used to communicate to the public and vulnerable populations;

(C) A log of dates and times the community initiated their response plan;

(D) A record of local meetings to discuss or update the community response plan.

(g) An SSRA that has their exemption revoked may reapply for the exemption after a year provided all conditions stated in (3) have been met.

629-048-0200

Alternatives to Burning

(1) When planning forest management prescriptions and particularly final harvests (prior to reforestation), owners are encouraged to use practices that will eliminate or significantly reduce the volume of prescribed burning necessary to meet their management objectives. Some practices to consider include, but are not limited to:

(a) Maximizing the cost-effective use of woody material for manufacture of products;

(b) Where cost-effective, using wood or other biomass for energy production or mulch;

(c) Lopping and scattering limbs and other woody material, or operating heavy machinery over the wood to maximize contact with the soil in order to speed its breakdown; or

(d) Re-arranging woody materials, as necessary to accomplish reforestation through the slash (from a fire prevention standpoint, this may not be desirable in areas of heavy fuel concentrations or where soil moistures are not conducive to breakdown of fuels).

(e) Removing or minimizing large fuel concentrations and heavy fuel loading to minimize smoldering.

(2) When prescribed burning is determined to be necessary to achieve forest management objectives, owners are encouraged to use emission reduction techniques as described in OAR 629-048-0210.

(3) Prior to registration, forestland managers are strongly encouraged to consult the following:

(a) "Non-burning Alternatives to Prescribed Fire on Wildlands in the Western United States" at http://www.wrapair.org/forums/fejf/tasks/FEJFtask3.html (Western Regional Air Partnership, February, 2004);

(b) The Oregon Forest Industry Directory website provides information on potential markets for woody material at www.orforestdirectory.com/; and

(c) "~~Oregon Forest Biomass Estimate~~ **Forest Biomass Analysis for Western States** by County" by Phillip S. Cook and Jay O'Laughlin (Western Governors' Association, January 24, 2011), ~~on the Woody Biomass Utilization Database at Oregon Department of Energy's website~~ **at**:
https://www.researchgate.net/profile/Jay_Laughlin/publication/266451188_Forest_Biomass_Supply_Analysis_for_Western_States_by_County_Final_Report_to_the_Western_Governors%27_Association/links/55b0ead208ae9289a0849d62/Forest-Biomass-Supply-Analysis-for-Western-States-by-County-Final-Report-to-the-Western-

Governors-Association.pdf
~~www.oregon.gov/energy/RENEW/Biomass/Pages/Bioenergy_maps.aspx~~

(4) As described in 629-048-0450(2)(c), the department shall complete an annual report summarizing the use of alternatives to burning.

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0210

Best Burn Practices; Emission Reduction Techniques

(1) "Best burn practices" as used in this rule refers to those practices designed to minimize emissions from prescribed burning or accomplish burning at times and under such conditions as to minimize the likelihood that emissions will have adverse effects to the air quality maintenance or visibility objectives (OAR 629-048-0120 and 629-048-0130). Additional practices not described in this rule may be necessary to ensure against the escape of fire or protection of forest resources.

(2) In general, best burn practices involve methods that ensure the most rapid and complete combustion of forest fuels while nearby, "non-target" fuels are prevented from burning, such as:

(a) Physical separation of "target" and "non-target" fuels;

(b) Burn prescriptions, particularly for broadcast burns, that recognize and utilize the natural differences in fuel moistures of larger and smaller pieces of woody material; or

(c) Covering of piles sufficient to facilitate ignition and complete combustion, and then burning them at times of the year when all other fuels are damp, when it is raining or there is snow on the ground.

(3) Rapid combustion is well served by rapid ignition which may involve the use of petroleum accelerants (with appropriate safety precautions) and by maintaining an adequate air supply to the forest fuels being burned. Piles and windrows should be mostly free of soil, rocks and other non-combustible materials and should be loosely stacked to promote aeration. Where practicable, re-stacking or "feeding" the burn pile is encouraged to complete combustion and avoid smoldering.

(4) When piles are covered as a best burn practice and the covers are to be removed before burning, any effective materials may be used, as long as they are removed for re-use or properly disposed of. When covers will not be removed and thus will be burned along with the piled forest fuels, the covers must not consist of materials prohibited under OAR 340-

264-0060(3), except that polyethylene sheeting that complies with the following may be used:

(a) Only polyethylene may be used. All other plastics are prohibited;

(b) The size of each polyethylene cover ~~must not exceed 100 square feet. For small piles, covering only an area~~ **may vary as** necessary to achieve rapid ignition and combustion. ~~instead of the entire pile, is encouraged;~~

~~(c) The thickness of the polyethylene cover must not exceed 4 mil; and~~

~~(d) Layering or multiple covers (exceeding 100 square feet combined) within a pile is prohibited, unless authorized in writing by the forester to meet ignition and combustion needs.~~

(5) The use of petroleum accelerants and polyethylene covers as "best burn practices" described in this rule is expressly intended as an exception to OAR 340-264-0060(3) as allowed by 340-264-0060.

(6) In general, rapid mop-up of prescribed burning is not needed to meet the objectives of the prescribed burn and protect air quality. However, in instances of prescribed burning within an SSRA or when conditions change significantly from those forecasted or present at the time of ignition, rapid mop-up may become necessary to prevent ~~excessive residual~~ **a** smoke ~~or entry of smoke into an SSRA or other area sensitive to smoke.~~ **intrusion**. Burn plans required under OAR 629-043-0026(4), prescribed fire plans required by federal land management agency policy, or burn permits required under ORS 477.515, when appropriate, should address conditions that may require mop-up of the prescribed burn and to what extent.

(7) When local conditions for smoke dispersal appear to be better than forecasted, burn bosses and field administrators are encouraged to communicate such information to the Smoke Management forecast unit, to further the objective of accomplishing burning during the most favorable conditions.

(8) As described in 629-048-0450(2)(c), the department shall complete an annual report summarizing the use of emission reduction techniques.

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0220

Forecast Procedures

(1) There are several concepts and procedural steps involved in accomplishing the Smoke Management Plan objectives, designed to maximize opportunities for accomplishing burning

while minimizing the likelihood of public health effects or visibility impairment in Class I Areas. The following sections of this rule attempt to explain some of these concepts.

(2) The basic underlying mechanism in smoke management is the use of an understanding of atmospheric dynamics and combustion processes, in concert with current weather forecasts, to ensure that the bulk of emissions from prescribed burning are transported to areas of low or no adverse effect by:

(a) In the case of broadcast or large pile burning, generating heat rapidly so that the fuel is quickly consumed and emissions rise sufficiently above ground level to either:

(A) Become diluted and dispersed in the atmosphere via transport winds to areas of minimal impact; or

(B) Mix with the moisture in clouds and fall back to earth as precipitation; or

(b) In the case of low-intensity underburning or small piles under the forest canopy, managing the volume of material burned per unit of time and paying careful attention to surface winds to keep total emissions low and disperse the smoke to relatively unpopulated areas.

(3) For each day that prescribed burning is planned on forestland with Level 1 regulation, a weather forecast is prepared by meteorologists specializing in smoke management. By examining the atmospheric conditions predicted for the burn day, such as vent heights, mixing layers, wind speed and direction, as well as information about what level of pollutants may already be present in a given area, the meteorologists determine if and where conditions will be favorable to accomplish burning.

(4) In addition to the weather forecast, specific information is required on the location of planned burns, and the tonnage of fuel that is expected to be consumed in a burn. This information is provided on a per unit basis at the time that burns are registered and planned with the forester (see OAR 629-048-0300).

(5) With knowledge of the information described above, and based on dispersion models that have been developed through time and experience, forecasters are able to reasonably predict how much smoke ~~and at what locations~~ can be put into the atmosphere**, and at what locations,** without likelihood of threat to air quality objectives. This information is then converted into instructions to field administrators and burn bosses as to what tonnages, in what weather zones and at what distances from SSRAs prescribed burning may be permitted.

(6) The forecast and instructions are made available to field administrators and any interested parties by 3:15 p.m. each day, as necessary. Locally, planned burns are compared against the forecast and instructions, as well as any local prioritization of burns, to determine which burns, if any, will be permitted on the following day. If there are any changes in the forecast for the day of the burn, the Smoke Management forecast unit will make every effort to place a message on an automatic answering phone by 8 a.m.

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0230

Burn Procedures

(1) Before any prescribed burning is initiated, burn bosses should have a well thought out plan that takes into account:

(a) How weather will be monitored and changes in conditions will be communicated;

(b) Resources needed and actions taken to reduce pre-burn fuel loadings to minimize emissions.

(~~b~~**c**) Resources necessary to accomplish ignition and ignition sequences;

(~~c~~**d**) Resources and methodology necessary to contain and control the fire and prevent its escape, including communications to access additional resources, if necessary; and

(~~d~~**e**) **The Smoke Management forecast and how** the burn will be conducted to ~~avoid~~ **minimize** smoke entering SSRAs, ~~or~~ other areas sensitive to smoke**, and other communities**. ~~and to minimize smoke effects on other communities.~~

(2) The forester may require that a written burn plan be prepared for approval under OAR 629-043-0026(4), prior to issuance of a burn permit. A prescribed fire plan is required under federal policy for all prescribed burning on federal lands.

(3) Prescribed burn operations with large tonnages (2000 tons or more) or burns that will occur over multiple days should be adequately planned and monitored to provide opportunities to cease lighting and hold the existing burn within smaller compartments **in orde**r to mitigate undesirable smoke effects or changes in the actual burn conditions from those that were forecasted.

(4) For prescription burn units on forestland subject to Level 1 regulation, burn bosses must provide specific information to be transmitted to the Smoke Management forecast unit in a standard format acceptable to the forester, regarding unit location, method of burning, and fuel loading tonnages by the day of the burn. If additional burning is deemed possible after 10 a.m. in consultation with the forecast unit, the plan deadline may be extended.

(5)(a) Before ignition of any prescribed burning in a fire season (as designated by the forester under ORS 477.505), the burn boss must obtain a permit to burn from the forester as required by ORS 477.515 (not required for federal land management agencies). Federal land management agencies must follow agency policies that provide for an affirmative "go-no go

decision" before ignition of any prescribed burning as documented and approved by the federal land management agency's line officer.

(b) A permit to burn from the forester is also required for all prescribed burning on non-federal Class 1 forestland in western Oregon at any time of the year.

(c) Under ORS 477.515(1)(a), the forester may waive the requirement for a burn permit in instances of burning other than described in subsections (a) and (b) of this section, so burn bosses should check with the forester locally to determine whether permits are required outside fire season.

(6) Before ignition of any prescribed burning on forestland subject to Level 1 regulation, the burn boss must obtain the current Smoke Management forecast and instructions and must conduct the burning in compliance with the instructions. Burn bosses must make provisions to be informed if the forecast or instructions are subsequently changed. Through communication among the burn boss, field administrator and the Smoke Management forecast unit, based on information specifically relevant to the burn location, a burn boss may obtain a variance from the instructions, but must document the time and method of communication and adhere strictly to the conditions of the variance.

(7) For prescribed burn operations with large tonnages (greater than 2000 tons) or burns that will occur over multiple days, burn bosses may request at least two days in advance that a special forecast and instructions be issued to ensure adequate attention to meeting Smoke Management Plan objectives. Issuance of a special forecast and instructions will be solely within the discretion of the Smoke Management forecast unit based on workload and sufficient local information to support the forecast.

(8) The Smoke Management forecast unit, in developing instructions, and each field administrator issuing burn permits are directed to manage the prescribed burning on forest land in connection with the management of other aspects of the environment in order to maintain a satisfactory atmospheric environment in SSRAs. This direction is to be applied to situations in which prescribed burning may impact SSRAs or other areas sensitive to smoke.

(9) Each burn boss or field administrator must validate that forecasted weather conditions are consistent with actual on-site conditions prior to ignition of burns.

(10) A burn boss is required to **stop** ~~terminate~~ ignition, in a manner that does not compromise worker safety or the ability to prevent escape of the burn, if either of the following occurs:

(a) The burn boss determines, or is advised by a field administrator, that an SSRA, or other area sensitive to smoke is already adversely affected by the burn or would likely become so with additional burning; or

(b) The burn boss receives notice from the forester, through the Smoke Management forecast unit, or following consultation with **DEQ** ~~the Department of Environmental Quality~~, that air in the entire state or portion thereof is, or would likely become adversely affected by smoke.

(11) Upon **stopping** ~~termination of~~ ignition required by section (10) of this rule, any burning already under way should be completed, residual burning should be extinguished as soon as practicable, and no additional burning may be attempted until approval has been received from the forester.

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0300

Registration of Intent to Burn

(1) In all instances of prescribed burning on forestland within a forest protection district, the operator, federal land manager, landowner, or timber owner must first register with the forester all forestland that is intended to be burned. For forestland subject to Level 1 regulation, burn registration must be completed at least seven days before the first day of ignition.

(2) The forester may waive the seven-day waiting period required in section (1) of this rule contingent upon the forester's approval of a burn plan or conditions of federally prescribed fire policies having already been met.

(3) Information provided for burn registration must be complete and recorded in a standard format approved by the forester.

(4) No operator, federal land management agency, landowner or timber owner shall be allowed to register additional forestland for burning if payment for their previous registration or burning, when required pursuant to OAR 629-048-0310, is more than 90 days past due.

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0310

Fees for Prescribed Burning

(1) Any prescribed burning on forestland subject to level 1 regulation (OAR 629-048-0100) requires payment of a non-refundable registration fee of $.50/acre and upon accomplishment (see section (3) of this rule), a burn fee as further described in sections (2), (3), (5), (6) and (8) below.

(2) Burn fees for all forms of prescribed burning, including but not limited to, broadcast burning and burning of piles (whether in-unit, on landings, or from rights-of-way) shall be assessed (where required) against the total acres in the unit from which the forest fuels were accumulated, as described in the burn registration.

(3) The first time that fire is applied to a prescribed burn unit, regardless of actual accomplishment, payment of a burn fee is required. Burn fees shall be charged according to the following schedule:

(a) If the registration of planned burning includes only landing or right-of-way piles, the burn fee shall be $.50 per acre registered. Subsequent attempts to improve accomplishment only in landing or right-of-way piles in the same unit, in the same calendar year or the two following calendar years, shall not incur additional fees.

(b) If the registration of planned burning includes other than landing or right-of-way piles, the burn fee shall be $3.10 per acre registered. Subsequent attempts to improve accomplishment in any portion of the same unit, in the same calendar year or the two following calendar years, shall not incur additional fees.

(c) If the registration of planned burning includes any combination of burn treatments that include landing or right-of-way piles with broadcast or in-unit pile burning, the burn fee shall be $2.60 per acre for each in-unit treatment registered upon the first attempt of each treatment. Landing or right-of-way piles will be $.50 per acre registered upon the first attempt **to burn** ~~of burning~~ any of those piles. Subsequent attempts to improve accomplishment in any portion of the same unit, in the same calendar year or the two following calendar years, shall not incur additional fees.

(4) (a) As used in this rule, "landing" means any location logs are yarded to for processing (trimming ends or limbs and tops remaining after yarding) and assembling for forwarding or loading onto trucks, including each loading site that may occur along a road. Consequently, a landing pile contains only those residues resulting from the processing, and not additional forest fuels accumulated from growth on the site or the felling process.

(b) As used in this rule, "right-of-way piles" means any accumulated forest fuels that come only from the area cleared in the pioneering stage of road construction after appropriate utilization.

(5) Areas burned as a result of escaped fires that are outside the description of the registered burn area shall not be assessed fees if the fire outside of the described area is immediately attacked for wildfire suppression. If the fire outside of the described area is managed as a prescribed fire then every additional acre burned shall incur a registration fee of $.50 per acre and a burn fee of $3.10 per acre.

(6) Notwithstanding section (3) of this rule, forest health maintenance burning on forestland subject to Level 1 regulation, where significant fuel reduction has been accomplished

through underburning within the last five years and where there are no piled forest fuels on the site, shall be charged a burn fee of $.50 per acre.

(7) The forester shall prepare monthly billings to collect the appropriate registration and burn fees from the operator, federal land manager, landowner or timber owner whose name is recorded on the registration form for billing purposes.

(8) Notwithstanding sections (1) and (3) of this rule, each burn unit requires a minimum combined registration and burn fee of $30. To reduce processing costs, the forester may elect to collect both registration and burn fees prior to accomplishment, for **landing, right-of-way, or maintenance** units less than ~~20~~ **30** acres on one combined billing. **The forester may elect to collect both registration and burn fees prior to accomplishment, for broadcast, underburning, or in-unit piles units less than 9 acres on one combined billing.**

(9) Notwithstanding sections (1), (3) and (7) of this rule, in accordance with ORS 477.562(6), a federal land management agency may enter into a cooperative agreement with the forester for payment of registration and burn fees at an annual flat rate. The rate shall be based on estimated acres to be treated as a percentage of total acres on all ownerships, applied against the overall annual estimated operating cost of the Smoke Management Plan. Any such agreement shall have a provision that allows for periodic adjustment of the rate based on actual experience.

(10) Notwithstanding section (7) of this rule, any person or entity described in ORS 477.406(1) with a prior record of timely payment may, at the discretion of the forester, enter into a cooperative agreement for the efficient administration and payment of registration and burn fees provided all payments equal no less than the registration rate described in section (1) of this rule times the number of acres registered plus the burn fee rate in sections (3) or (6) of this rule, as appropriate, times the number of acres accomplished.

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0320

Reporting of Accomplishments

(1) Accomplishment information for all prescribed burning that takes place on forestland within the regulated area described in OAR 629-048-0100 must be recorded in a manner that details the amount of burning ~~and emissions produced for~~ each day ~~of burning~~ and must be reported to the department according to the schedule described below and in standard formats prescribed by the forester.

(2) Prescribed burning on forestland subject to Level 1 regulation must be reported the next business day following each day's ignition as described in Department Directive 1-4-1-601, “Operational Guidance for the Oregon Smoke Management Program, Appendix 1.”

(3) Prescribed burning on forestland subject to Level 2 regulation must be reported by the first business day of the week following ignition as described in Department Directive 1-4-1-601, "Operational Guidance for the Oregon Smoke Management Program, Appendix 1."

~~[ED. NOTE: Appendix referenced is available from the agency.]~~

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0330

Emission Inventories

(1) In addition to the emissions information collected from prescribed burning under OAR 629-048-0320, the forester will annually estimate, using appropriate models and the best available information on acres burned and fuel type, the emissions produced by wildfires in Oregon. At a minimum, the forester will attempt to collect information about wildfires that burn on forestlands within a forest protection district.

(2) Emissions information from prescribed burning and from wildfires will be maintained as distinct inventories, in appropriate forms, for analysis and distribution to improve the overall understanding of the relationships of wildfire versus prescribed fire emissions.

(3) The forester may include as much information on wildfires as may be readily available from the various protection agencies and other cooperators, provided that gathering of such information does not create an unfunded cost to the Smoke Management program.

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0400

Coordination with Other Regulating Jurisdictions and for Other Pollutants

(1) In order to meet the air quality maintenance and visibility objectives of the Smoke Management Plan (OAR 629-048-0120 and 629-048-0130), it is important that the forester, field administrators and other cooperators be well informed as to the existence of, or potential for smoke or other airborne pollutants other than that which will be produced by any planned prescribed burning in the affected airshed. Local field administrators are encouraged to maintain working relationships with other local jurisdictions that authorize open burning or monitor air quality so that all parties may be adequately informed of planned burns or conditions that cumulatively might exceed standards or objectives.

(2) The forester is required to report the weather forecast, planned and accomplished burning and smoke intrusions, if any, to the Department of Environmental Quality for each applicable day, on a timely basis.

(3) Any wildfire that has the potential for smoke input into an SSRA or other area sensitive to smoke must be reported immediately by the local unit of the state or federal agency with jurisdiction for fire suppression to the State Forester's office.

(4) The Smoke Management forecast unit will communicate periodically with appropriate prescribed burning regulators in the surrounding states for the purpose of coordination and information sharing, as appropriate.

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0450

Program Evaluation and Adaptive Management

(1) The department is responsible for analysis and evaluation of the prescribed burning operations conducted under the Smoke Management Plan.

(2) Reports summarizing annual activities of the program shall be published by the department addressing:

(a) The level of burning activity;

(b) ~~Results with regard to avoiding entrance of smoke into SSRAs and other areas sensitive to smoke and reports of any smoke intrusions~~ **Smoke intrusions and smoke incidents**;

(c) PM2.5 NAAQS exceedances caused by prescribed burning and actions taken to prevent reoccurrence as described in OAR 629-048-0110(5).

(~~c~~**d**) Accomplishment of alternatives to burning and the use of emission reduction techniques;

(~~d~~**e**) Evaluation of overall Smoke Management Plan accomplishment;

(~~e~~**f**) Evaluation of adequacy of listed SSRAs and protection measures;

(~~f~~**g**) Any other pertinent information related to Smoke Management Plan evaluation and improvement; and

(~~g~~**h**) Revenues generated from burn fees and related Smoke Management Plan costs.

(3) Copies of the reports described in section (2) of this rule will be made available to all interested parties.

(4) Upon publication of a report in accordance with section (2) of this rule, the forester will consult at least annually with the Smoke Management Advisory Committee created under ORS 477.556. Topics will include, but are not limited to, Smoke Management Plan implementation, status of the Oregon Forest Smoke Management Account (ORS 477.560), and any fee changes that may be appropriate based on the balance in this account.

(5) **ODF** ~~The Department of Forestry~~ and **DEQ** ~~the Department of Environmental Quality~~ will jointly review the Smoke Management Plan every five years unless there is agreement by both agencies that the plan can be reviewed at an earlier or later date, not to exceed 10 years from the previous review. Results of the review will be presented to the State Forester and the Director of Environmental Quality for joint consideration and approval. Representatives of affected agencies may assist the review at the discretion of the State Forester.

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

629-048-0500

Enforcement

(1) Violations of the Smoke Management Plan may be enforced either as violations of the fire prevention statutes and rules (ORS 477.980 to 477.993) or as violations of the forest practice rules (ORS 527.680 to 527.690, 527.990 to 527.992 and OAR 629-670).

(2)(a) When, in the judgment of the forester, a violation is related primarily to an act or omission that has caused or might cause fire to burn uncontrolled, enforcement under the provisions of the fire prevention statutes and rules is appropriate.

(b) When, in the judgment of the forester, a violation is related primarily to an act or omission that has caused or might cause deterioration of air quality, enforcement under the provisions of the Forest Practices Act and rules (specifically, OAR 629-615-0300) is appropriate.

(3) Enforceable standards within the Smoke Management Plan include requirements to:

(a) Register burns prior to ignition (OAR 629-048-0230(4) and 629-048-0300);

(b) Obtain approval for and follow a burn plan (OAR 629-048-0230(2) and 629-043-0026(4);

(c) Obtain a burn permit and comply with any conditions included therein (OAR 629-048-0230(5) and ORS 477.515);

(d) Obtain and comply with daily Smoke Management instructions and updates (OAR 629-048-0230(6);

(e) Comply with restrictions regarding use of ~~polyethylene~~ covers on burn piles (OAR 629-048-0210(4);

(f) Cease burning when directed by the forester (OAR 629-048-0100(4) and 629-048-0230(10);

(g) Report accomplishments (OAR 629-048-0320); and

(h) Pay fees (OAR 629-048-0310).

(4) Section 118 of the federal Clean Air Act provides for enforcement of state air quality regulations against federal agencies. It will be the policy of the Board of Forestry, in the event of a failure of a federal land management agency to comply with the Smoke Management Plan, that the forester will first inform the responsible agency of the failure and coordinate efforts to ensure timely correction of any breakdowns in procedure that may have resulted in the failure. However, if this method does not appear in the judgment of the State Forester to result in necessary correction of procedures, or under other circumstances that in the judgment of the State Forester warrant further action, enforcement action may be taken as with any other responsible party.

Stat. Auth: ORS 477.013, 477.562, 526.016, 526.041
Stats. Implemented: ORS 477.013, 477.515, 477.562
Hist.: DOF 4-2007, f. 12-31-07, cert. ef. 1-1-08

ODF Fiscal Impact Statement

Secretary of State

STATEMENT OF NEED AND FISCAL IMPACT

A Notice of Proposed Rulemaking Hearing or a Notice of Proposed Rulemaking accompanies this form.

Oregon Department of Forestry – Fire Protection Division 629

Agency and Division Administrative Rules Chapter Number

Oregon Smoke Management Plan Revision and Update

Rule Caption (Not more than 15 words that reasonably identifies the subject matter of the agency's intended action.)

In the Matter of: Revision of the Oregon Smoke Management Plan

Statutory Authority: ORS 477.013 and 477.562

Other Authority: ORS 526.016 and 526.041

Stats. Implemented: ORS 477.013, 477.515 and 477.552 to 477.562

Need for the Rule(s): The federal Clean Air Act requires states to periodically update their state implementation plans to demonstrate continued progress toward meeting federal air quality standards. One part of the state's implementation plan is the management of forestry prescribed burning through the Oregon Smoke Management Plan administered by the State Forester. The plan was recently reviewed and determined to need updating to examine the state policy of prescribed burning as used to mitigate wildfire and improve forest health. Changes to the rule include changing the definition of a smoke intrusion to match a health-based standard, developing a community response plan to notify residents of Smoke Sensitive Receptor Areas that smoke may impact their community at greater intervals, expanded use of polyethylene sheeting to keep burn piles dry for burning later in the fall season, and other related alterations based on the above major changes.

Documents Relied Upon, and where they are available: The rule changes are based on recommendations provided by both Oregon Department of Forestry and Department of Environmental Quality informed by a Smoke Management Review Committee. They are found in a staff report and draft update to OAR 629-048, presented at the June 6th, 2018 Board of Forestry meeting. Copies of the report and Board minutes can be viewed or made available by contacting Jenna Nelson, Rules Coordinator, 2600 State St. Salem, Oregon 97310; telephone (503) 945-7444; or email at jenna.a.nelson@oregon.gov.

Fiscal and Economic Impact: While there are a number of rule changes, only one appears like it may have an indirect fiscal impact. A new rule will allow for an increase in prescribed burning because of a change in the "smoke intrusion" definition. This change will allow for a greater amount of smoke to enter Smoke Sensitive Receptor Areas (SSRAs) before it's considered a smoke intrusion. To mitigate the effects of increased smoke, community response plans will be implemented in SSRAs vulnerable to prescribed burning smoke.

Statement of Cost of Compliance:

1. Impact on state agencies, units of local government and the public (ORS 183.335(2)(b)(E)): Expect some additional workload on forest districts that have SSRAs within or near their protection boundaries as they assist in the development of community response plans. Additional workload would be absorbed by the affected district with minimal fiscal impact. However, the local government, especially local public health authorities, may have additional fiscal impact as a part of notifying health vulnerable citizens of SSRAs that have increased risk of prescribed burning smoke exposure. It's difficult to determine the costs of

additional communication to notify vulnerable populations but estimates could range up to a few thousand dollars.

2. Cost of compliance effect on small business (ORS 183.336):
a. Estimate the number of small businesses and types of business and industries with small businesses subject to the rule: There are more than 2500 small landowners who have forestland and occasionally pay registration and burn fees.

b. Projected reporting, recordkeeping and other administrative activities required for compliance, including costs of professional services: To set up a community response plan would likely require administrative activities of coordinating between several governmental agencies, businesses, and other stakeholder interests in developing a plan. Potential costs could range up to a few thousand dollars.

c. Equipment, supplies, labor and increased administration required for compliance: Costs to develop and implement a plan may range up to a few thousand dollars.

How were small businesses involved in the development of this rule? Rule development was discussed routinely with the Smoke Management Review Committee as well as receiving a final review by the Smoke Management Advisory Committee (required under ORS 477.556). Both the Review Committee and Advisory Committee included representatives from industrial forest landowners and non-industrial forest landowners. In addition, all meetings of both committees were open to the public with public comment periods available.

Administrative Rule Advisory Committee consulted? Yes. The Smoke Management Review Committee was established for the purpose of recommending changes and improvements to the Oregon Smoke Management Plan. Rule development was reviewed by the Smoke Management Advisory Committee.

Signature Printed name
Date

Administrative Rules Unit, Archives Division, Secretary of State, 800 Summer Street NE, Salem, Oregon 97310.

Supporting Documents

Document 1: Full text of public comments and agency responses

Document 2: Atmospheric Environment: Emissions from prescribed burning of timber slash piles in Oregon

Document 3: Oregon Department of Forestry Directive 03/19 1-4-1-601, Operational Guidance for the Oregon Smoke Management Program

- Document in redline, showing the proposed edits to be voted upon by the Oregon Board of Forestry Jan. 9, 2019

Public comments and agency responses
Oregon Smoke Management Plan updates

Table 1: Summary table of stakeholder comments and DEQ responses by primary comment theme

200 total comments (162 written, 38 provided at public hearing)

Primary Comment Theme	Comment/Response #	DEQ Response
Support the Smoke Management Plan without any stated stipulations 74 of 200 responses; **37 percent**	*Written Comments*: 3, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 24, 25, 26, 27, 28, 29, 30, 31, 33, 34, 35, 39, 40, 42, 43, 45, 48, 51, 55, 57, 60, 61, 62, 80, 81, 83, 85, 88, 89, 90, 91, 92, 98, 99, 100, 101, 106, 107, 110, 112, 114, 115, 117, 118, 119, 132, 140, 147, 150, 153 *Public Hearing Comments*: 1, 18, 19, 20, 21, 24, 28, 33	Thank you for your comment.
Support components of the Smoke Management Plan but are concerned with the 1-hour standard and want a clear, simple and attainable process to obtain an exemption from the 1-hour standard 80 of 200 responses; **40 percent**	*Written Comments:* 1, 4, 22, 23, 36, 37, 47, 53, 54, 58, 59, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 93, 95, 97, 102, 108, 111, 113, 120, 123, 124, 128, 129, 130, 133, 134, 135, 139, 141, 142, 144, 145, 146, 151, 154, 155, 156, 157, 158, 160, 162 *Public Hearing Comments*: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 22, 27, 29, 30, 32, 35, 36, 37	The proposed rule language allows for an estimated increase of prescribed fire use by 80%. Guiding legislation for the Smoke Management Program directs DEQ and ODF to seek a balance of the use of prescribed fire as a forest management practice, with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to meet that balance. Furthermore, the increased potential for smoke entering communities comes with the increased need for proactive communications about prescribed fires and the potential impacts. The proposed rules require ODF and DEQ to develop a communication framework for prescribed fires to be used throughout Oregon. This framework will include information that the public can use to protect their health.
Against the Smoke Management Plan due to health or environmental concerns associated with increased use of prescribed burning	*Written Comments*: 21, 38, 41, 44, 49, 52, 56, 86, 121, 122, 126, 127, 136, 143, 152, 159 *Public Hearing Comments*: 31, 38	DEQ agrees that smoke impacts health, no matter the concentration. Guiding legislation for the Smoke Management Program directs DEQ and ODF to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to meet that balance. With the

18 of 200 responses; **nine percent**		increased potential for smoke entering communities comes the increased need for proactive communications about prescribed fires and their potential impacts. The proposed rules require ODF and DEQ to develop a communication framework for prescribed fires to be used throughout Oregon. This framework will include information that the public can use to protect their health from smoke.
Do not want any regulations limiting the use of prescribed burning 4 of 200 responses; **two percent**	*Written Comments:* 84, 109, 116, 161	Thank you for your comment.
Request that other strategies be considered to reduce fuel-loads (mulching, grazing, thinning, etc.) Five of 200 responses; **three percent**	*Written Comments:* 9, 32, 104 *Public Hearing Comments*: 23, 25	Thank you for your comment. The existing Smoke Management program seeks to implement alternatives to prescribed fire, but is otherwise outside of the scope of this rulemaking.
Other 15 of 200 responses; **nine percent**	*Written Comment*: 2, 46, 50, 82, 87, 94, 96, 105, 125, 131, 137, 138, 148, 149 *Public Hearing Comments*: 14, 17, 26, 34	Thank you for your comment.

In addition to the primary comment themes, there were some stakeholders commenting on the use of polyethylene plastic over burn piles. Of the 200 respondents, four percent were either against the expanded use of plastic, or wanted more research on kraft paper (Written Comments: 59, 66, 93, 108, 127, 130 and Public Hearing Comments # 14, 30). Of respondents, two percent were in favor of the expanded use of polyethylene (Written Comments 101, 146, and Public Hearing Comments 19, 23).

Full text of comments and agency responses

Comment #1

I am writing concerning the Smoke Management 2018 Rulemaking. Recent fires across the West have demonstrated the importance of active fire management for the benefit of our communities and the health of our ecosystems. Decision-makers, managers, and the public increasingly support management actions such as the use of prescribed burning. This tool has many benefits and has been part of Oregon's wildlands since time immemorial, given its historic and continued use by Oregon's Tribes. It is important that legislation support the increasing use of prescribed burning for society to reap its many benefits, including reducing emissions by preventing large wildfires. For this reason, I am concerned about the inclusion of the 1-hour standard as a basis for an intrusion.

The transient negative impacts of emissions from prescribed burning must be weighed against the massive emissions from large wildfires, not to mention industrial and agricultural sources. For example, all emissions from 2 weeks of prescribed burning during a training event in the Klamath-Siskiyou Mountains last year were estimated to be equivalent to 0.02% of the emissions during a single large wildfire event. Yet these intentional burns can reduce the potential of more severe wildfire and smoke events. The cost to air quality of prescribed burning must be mitigated, but regulations that stifle its use risk incurring much greater costs to air quality and to numerous other values that Oregonians care about. I urge you to consider eliminating the 1-hour standard as a basis for an intrusion. Restoring forest and grassland health on private and public lands, as well as community protection, depends on management tools such as prescribed burning, and therefore on a supportive regulatory environment.

While awareness of the need to use fire for ecosystem health is growing, numerous obstacles remain to its effective implementation. I trust you will align your rulemaking with the broad societal consensus in favor of restoring fire-prone habitats.

Christopher Adlam, McMinnville, OR

Response #1

Thank you for your comment. The proposed rule language allows for an estimated increase of prescribed fire use of about 80%. Guiding legislation for the Smoke Management Program directs DEQ and ODF to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to meet that balance.

Comment #2

My property is land locked and surrounded by unmanaged land. My ½ mile driveway is my only evacuation route and is not fire safe because the residents nor counties manage it. Rough and Ready land, recently logged and now over grown, is adjacent to my yard space. The Siskiyou National Forest is also adjacent to my property and I was one evacuated this 2018 fire. (You can understand my concern and requests.) 1) Require residents or counties to maintain shared driveways which would also provide a fire break. 2) Require Rough and Ready to provide and maintain an evacuation route and maintain a defensible area and/or fire break where adjacent to residential properties. 3) Require Siskiyou National Forest to provide and maintain an evacuation route and a defensible area and/or fire break where adjacent to residential properties.

Evelina Yoder

Response #2

Thank you for your comments. The issue of fire breaks or defensible space are outside of the

scope of the Smoke Management Program rulemaking effort, but DEQ understands your concern with defensible space setbacks near residential properties.

Comment #3

Just seeking cleaner air. I live downtown and want the diesel fumes gone and anything else you can do to limit the health stealing air pollution of my new Portland home.

Holly Hansen

Response #3

Thank you for your comment.

Comment #4

To Whom It May Concern:

On behalf of the Oregon Wild, we thank you for the opportunity to provide comments to the Oregon Department of Forestry (ODF) and Oregon Department of Environmental Quality (DEQ) concerning the proposed rule changes to Oregon's Smoke Management Plan. This summers' fire season in Oregon and across the West is yet another reminder that there is more work to be done reducing potentially unnaturally intense fires through the use of prescribed fire. In Central Oregon, we and our partners are taking proactive steps to reduce the risk of wildfires near communities, including the strategic use of prescribed fire in the forests immediately around our communities. To continue this work we need a holistic and forward-thinking smoke management policy in Oregon.

We appreciate the work by ODF and DEQ staff in leading the smoke management plan review and we support the effort to align Oregon's smoke management rules with the federal Clean Air Act 24-hour National Ambient Air Quality Standards (NAAQs). We believe that using the NAAQS (including the proposed buffer of 75% of the NAAQS) to define smoke intrusions strikes is a step in the right direction. We support a healthy balance between protecting public health and allowing critical prescribed burning to occur as we work together to confront the very real wildfire threat facing our communities.

For this reason, we have significant concerns with the 1-hour threshold, which runs counter to our interest in a smoke management policy that accounts for the short and long-term consequences of wildfire. Data shows that the 1-hour threshold would impose a significant limitation on the very prescribed burning priority areas that are most critical to our community wildfire protection efforts here in Central Oregon.

We also support a clear, simple, and attainable process to obtain an exemption from the 1-hour smoke threshold when communities have implemented a smoke communication and mitigation plan.

Thank you for the opportunity to provide comment on the proposed rules. The fire-prone forests of Central Oregon will burn sooner or later. We can however influence to some degree when and how they will burn: in a controlled manner during carefully planned and implemented prescribed fire or during out- of-control wildfires. In light of the science on this topic, we believe that the short-term smoke impacts of prescribed fire will be far less than the impacts of wildfire in the long-run and we urge you to adopt the proposed rules so we can do what is needed to protect our forests, communities, and firefighters now and in the future.

Respectfully,

Erik Fernandez

Wilderness Program Manager Oregon Wild

Response #4

Thank you for your comment. The proposed rule language allows for a theoretical increase of prescribed fire use of about 80%. Guiding legislation for the Smoke Management Program directs DEQ and ODF to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to meet that balance.

Comment #5

The prolonged periods of smokiness in Portland and Eugene are exposing millions of residents to extremely poor air quality and smoke related health hazards annually, due to poor forest management and a public fear of controlled burning. Studies show these controlled burns do not lower air quality like a wildfire. Residents who live in secluded parts of the woods without adequate escape routes should know the risk that they are taking and have no right to affect policy that would improve quality of life and life expectancy for millions of residents in urban zones. Protecting the rights of relatively wealthy landowning people at the expense of diverse and lower income populations in urban zones is at best problematic and at worst emblematic of this region's history of systemic racism. My complaints are that the majority of people who this will affect will never see this announcement or have the opportunity to express their support. My complaint is that too often policy is built on comment instead of prevailing scientific evidence. This has taken at least 30 years too long. Make the changes, make them now, and please tell the wealthy owners of homes in vulnerable areas that they are fully capable of paying to add exit routes, etc., and we the people of urban zones will no longer choke on pollution they are complicit in creating.

Adrian Levick

Response #5

Thank you for your comment.

Comment #6

I’m definitely in support of prescribed burning to prevent the buildup of fuels that cause such a huge amount of smoke along with wildfires. I do have asthma but would much prefer this better management alternative despite that.

Rachel Winters

Response #6

Thank you for your comment.

Comment #7

I support this rule change. I live in Ashland Oregon and the smoke this year is unbearable. We need more fire to get the wildfire under control. We must change tactics, the status quo is not working.

Jonathan Willing

Response #7

Thank you for your comment.

Comment #8

I support revising the rules to allow more burning under proscribed conditions.

Gary Holeman

Response #8

Thank you for your comment.

Comment #9

Bring back logging with proper forest management and grazing to reduce fuels so the fires don't burn so hot and fast.

Donald Cochran

Response #9

Thank you for your comment. The existing Smoke Management program seeks to implement alternatives to prescribed fire, but is otherwise outside of the scope of this rulemaking.

Comment #10

Sounds like a good idea to me! Better a little smoke in winter than what we have now!

tangrena@mind.net

Response #10

Thank you for your comment.

Comment #11

We deal with private timber companies burning whenever they want during the fall and spring and I see no reason to federal or state to burn when possible. We need to take care of our over-stocked forests so I'm all for this!

Shirley Nickell

Response #11

Thank you for your comment.

Comment #12

I support the rewriting of the rules governing prescribed fires to provide increased forest management and strategically reducing the over-forested lands in Oregon.

I also support air quality standards that could be flexible for limited periods of time, to allow prescribed burning for this purpose.

In communities particularly vulnerable to wildfire, programs should be developed to protect vulnerable populations. This could include such steps as providing community warnings of prescribed fires and indoor locations providing filtered air.

I would also support improved logging opportunities – that which would NOT include clear cutting, but a more strategic, surgical logging to thin the forests, while keeping healthy older specimens that are more fire resistant.

Sincerely, Geraldine Ventura

Response #12

Thank you for your comment.

Comment #13

I support prescribed burning as a means of lowering emissions from potential wildfires. I take air quality issues quite seriously because of the studying I've done on PM2.5 and its health effects. I'd rather have a controlled dose of smoke from a prescribed fire than a very high dose from a wildfire.

Anonymous

Response #13

Thank you for your comment.

Comment #14

I support prescribed burning to reduce hazardous fire risk to our communities and public lands and resources.

Kathryn Bulinski

Response #14

Thank you for your comment.

Comment #15

Yes to more controlled burns during the rainy season.

Gabi Ford

Response #15

Thank you for your comment.

Comment #16

I am supportive of these changes to the ODF Smoke Management Plan. As a professional forester in Oregon experienced in forest management and firefighting I see the need for increased

flexibility to conduct prescribed burning in Oregon to help subdue the opportunity for wildland fire. Not all fire will be eliminated by proactive wildfire fuel reduction efforts. But many fires will burn less intense sending out less smoke during the summer and allowing wildland fire professionals better opportunity to control them. A smoke management system as described here will allow for more opportunity while keeping our air healthy. This is a positive change in ODF rules that should be lauded as an example for others to follow.

Ted Reiss

Response #16

Thank you for your comment.

Comment #17

Controlled burns during optimal weather is infinitely superior to the unknowns wildfire risks both in terms of healthy/ safety and of the costs incurred.

Anne Clarke

Response #17

Thank you for your comment.

Comment #18

Let's use common sense here rather than antiquated notions of fire suppression and unwillingness to see smoke in our skies. To limit smoke beyond state and federal clean air guidelines (e.g. visible smoke) and thus prevent or limit controlled burns that we so desperately need is incredibly short sighted and counterproductive. Those who want to limit the smoke and thus the implementation of controlled burns will suffer far worse smoke from the higher intensity wildfires that result from decades of fire suppression. And their short sightedness will inflict this impact on others who will suffer because of this lack of common sense. Look at the science - without controlled burns and in the face of climate change driven hotter, drier weather patterns we are doomed to larger and more frequent wildfires and the resultant plumes of smoke. It will take decades or even generations to right the past mistakes of fire suppression. We need to be tackling this problem today in a substantial and urgent manner so that our children or at least our grandchildren don't suffer the consequences of our short sightedness today.

Geoff Weaver

Response #18

Thank you for your comment.

Comment #19

I am concerned about future large wildfires and so, I support prescribed burning prevention measures. Please allow wildfires to burn when possible, and increase restoration and prevention measures to prevent future catastrophic wildfires. While a little smoke is inconvenient now, it is much preferred to destructive wildfires in the future.

Lisa Foster

Response #19

Thank you for your comment.

Comment #20

Regarding wildfire smoke, I strongly support *long term* approaches to this increasingly important issue. If we must suffer more smoke in the short term in exchange for a brighter tomorrow, so be it. We cannot continue to treat fires as single, short-term events. The trajectory of such short-sighted action is not good.

Doug Viner

Response #20

Thank you for your comment.

Comment #21

I am commenting on Smoke Management 2018 Rulemaking. These proposed new rules (weakening air quality standards) would make a bad situation even worse. There are better ways to deal with overgrown forests. PROBLEMS WITH PROPOSAL: The following statement, supposedly a "solution", appears to be short-sided: “(State Forester) Daugherty said in some cases, the new standards could be breached for one-hour periods in communities particularly vulnerable to wildfire if they develop programs to protect vulnerable populations. This includes such steps as providing community warnings of prescribed fires and indoor locations providing filtered air." First off, "one-hour"? Since when can smoke levels be predicted with that kind of accuracy? Secondly, "Vulnerable populations”? Cities throughout Oregon already regulate wood smoke, since it’s unhealthy to ALL populations". We have had smoke warnings of "unhealthy", or worse, in areas all over the state, especially in SW areas of the state. Smoke is HAZARDOUS. When smoke is present, it WILL affect our fellow citizens. Thirdly, this statement does not address people who HAVE TO BE outside all day, or parts of days, in order to earn a living.

Examples-and I'm sure we can think of others, if we put our minds to it-are farm workers; carpenters, roofers, masons, and others in the building trades; landscape workers; surveyors, road construction workers; house painters; park rangers; life guards; hydrologists/hydrologic technicians; UPS drivers; US Postal Service workers. These people cannot simply stop working, and race over to a building with filtered air. As a former carpenter/framer/general contractor, I can tell you how hard it would be to do so, even for one hour. We could le never simply leave a building site unattended, even for one hour. Tools and materials tend to grow legs! And does the mail carrier simply stop delivering mail on smoky days? ALTERNATIVE SOLUTIONS Alternative 1. A) Fight fires as we’ve done for over 100 years; readopt the USFS mantra “Every Fire Out By 10:00(a.m.)”. B) Increase readiness, increase standby fire fighting forces and equipment. Reinstate Smoke Jumpers bases. Hit fires hard and fast! C) Allow commercial trees to naturally overtake brush species; the forest will eventually recover from excess brush, if we allow commercial trees to grow, and not be killed by fires. When forests become overstocked with timber species, do some commercial thinning. D) Outlaw clear cutting, at least in dry areas, e.g. SW Oregon forests, where clearcuts almost always result in highly flammable brushfields. E) Harvest only percent of forest canopy which can be harvested without resulting in brushfields. Alternative 2. A) Everything in Alternative 1. B) Also, utilize wood chippers, slash-busters, etc. to turn undesirable understory species into mulch. Mulch -unlike fires-adds nutrients to soil, keeps soil

cooler, and retains soil moisture, all of which increase rate of tree growth. C) Utilize lop-and-scatter in areas inaccessible to slash-busters, wood chippers, etc. Alternative 3 A) Everything in Alternative 1. B) Utilize Slash-Busters, Bulldozers, and/or firefighters to cut strategic firelines, for use in future wildfires. (NOT like the excessively wide fire lines used on the Biscuit Fire, the Taylor Creek Fire, the Klondike Fire, etc.) Alternative 4) A) Utilize/pay suitable prisoners who volunteer to clear brush using various hand tools. B) Require suitable recipients of unemployment insurance to work at clearing brush, in order to continue receiving benefits, while paying them a "living wage".

Malcom Drake

Response #21

Thank you for your comment. DEQ agrees that smoke impacts health, no matter the concentration. Guiding legislation for the Smoke Management Program directs DEQ and ODF to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to meet that balance. With the increased potential for smoke entering communities comes the increased need for proactive communications about prescribed fires and their potential impacts. The proposed rules require ODF and DEQ to develop a communication framework for prescribed fires to be used throughout Oregon. This framework will include information that the public can use to protect their health from smoke.

Comment #22

Ms. Nelson and Ms. Hniddy:

After careful review and study the La Pine Rural Fire Protection District wishes to comment for the record on the arbitrary and non-science based proposed restrictions to smoke thresholds for prescribed burning, especially near vulnerable wildfire communities. This fire district strongly supports prescribed burning as a necessary and essential tool to promote public safety and health as well as forest health and asks that Oregon DEQ not to place restrictions, such as the "1-hourrule",that impedes those benefits.

One does not need to look far this year to see the size and destruction of wildfires in and near our communities. As this letter is being composed this community is choking in moderate to unhealthy air quality from these uncontrollable mega wildfires near and far and has for the past three weeks with no end in sight.

Central Oregon and the Eastern Slope of the Cascade is historically a natural fire habitat in which frequent small and lower intense fire was part of the biological balance maintaining forest health. Over the last100 years grazing, logging, fire suppression (of the small fires), and now with changing climate conditions, have changed the forest environment to where now almost every wildfires a conflagration and destroying almost everything in its path. These mega fires also put millions tons (100 years' worth at once) of particulate matter, CO2, poisonous CO and other toxins into the air we all breathe. These hazardous situations often lasting for days if not weeks all season long canceling events, outside activities, closing schools and with our 911ems services seeing a dramatic increase (300%) in breathing problems and other medical issues of our vulnerable populations.

Prescribe fire, along with forest thinning and mechanical fuel reduction are needed together to replace the natural healthy balance of our forest and communities. Most prescribe burns and any resulting natural smoke is completed in just one or two operational periods- not the weeks and months of the wildfires, they also do not burn unwanted manmade materials that will produce toxins. However, the acreage that needs to be treated by prescribed fire to make this positive difference needs to be increased not decreased. Thus this public safe agency advocates for science based rules that look at the whole

public safety picture and that meets that end.

LA PA RURA PROTECTION DISTRICT

Mike Supkis, La Pine Rurual Fire Protection Agency

Response #22

Thank you for your comment. DEQ agrees that smoke impacts health, no matter the concentration. Guiding legislation for the Smoke Management Program directs DEQ and ODF to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to meet that balance. With the increased potential for smoke entering communities comes the increased need for proactive communications about prescribed fires and their potential impacts. The proposed rules require ODF and DEQ to develop a communication framework for prescribed fires to be used throughout Oregon. This framework will include information that the public can use to protect their health from smoke.

Comment #23

I support the proposed Smoke Management Plan revision calling for the elimination of the arbitrary 1- hour threshold and instead replacing it with the federal Clean Air Act 24-hour National Ambient Air Quality Standards (NAAQs). My understanding of the intent and purpose of the 1-hour standard was to protect society from smoke hazards with particular focus on the most vulnerable populations. This was and still is a worthy goal, which I understand the 24-hour NAAQs will provide this protection. Adopting this revision also provides more opportunity to address hazardous fuel loads in and adjacent to Wildland Urban Interface areas where people, infrastructure, and commerce are concentrated. Reduction in hazardous fuels will increase firefighter safety, community protection, and potentially reduce hazardous smoke caused by wildfire. During the Smoke Management Plan revision discussions it came to light that there was a need to do a better job coordinating prescribed fire activities with local health organizations to provide better means for vulnerable populations to protect themselves from smoke, which would apply for both prescribed and wildfire smoke. The Deschutes Collaborative Forest Project (DCFP) took on this challenge resulting in a single source website where pertinent information can be obtained. My understanding is that there is an exemption to the 1-hour standard for those communities who implement a plan such as Deschutes County has, and yet the metrics a community has to meet to quality are missing. Given the large difference in communities and their ability to develop said plan I suggest the exemption metrics not be cumbersome with approval by the local County Commission. All could use the website for Deschutes County as their base, with more local information provided as appropriate.

What I see as the greater achievement with the rule change is two fold:

It provides opportunities for communities vulnerable to wildfire to better protect their firefighters, communities, and commerce from wildfire, and

It increases coordinated effort between fire services and health services to devise means to better protect the community at large; in particular vulnerable populations from smoke during short duration prescribed fire activities and the longer more impacting wildfire events.

Thank you for the opportunity to comment,

Glen Ardt

Response #23

Thank you for your comment.

Comment #24

I'm in favor of reevaluating the smoke management plan. I think it makes sense to use controlled fires to decrease the magnitude of wild fires.

Jennifer Pom

Response #24

Thank you for your comment.

Comment #25

I have bad asthma. I would rather have a few days of light smoke from prescribed fires than miss the entire summer because the whole state is on fire. It didn't use to be this bad in the early 90s when logging and pre-burns kept things in better check.

Tim Jensen

Response #25

Thank you for your comment.

Comment #26

Supports more prescribed burning in our forests to eliminate the build-up of fuels.

Angelina McClean

Response #26

Thank you for your comment.

Comment #27

I'm unable to attend my local meeting, but I want to convey my strong support for modifying the existing rules to allow for more prescribed burning.

Leslie Edwards

Response #27

Thank you for your comment.

Comment #28

I support the proposed rule revisions, and I support additional use of prescribed fire as a forest management tool. As a member of Eastern Oregon Climate Change Coalition, a 501c3 nonprofit group, I

know that eastern Oregon's fire seasons have experienced a significant trend of increasing temperatures during the summer months, and this trend is projected to worsen in coming decades as the climate continues to change. As fire seasons lengthen with warming temperatures, then periods during the year when prescribed fire would be suitable may become fewer. This means that it is even more important to have smoke management rules supporting use of prescribed fire because weather windows in which to use it will be smaller.

David Powell

Response #28

Thank you for your comment.

Comment #29

Any and all rule changes which lengthen the burning season in both the spring and the fall and allow more fuel to be consumed in prescribed fire. Especially in fires associated with eco- silvicultural harvest or industrial harvest are welcome by me. The more we can reduce fuels especially in dry forest areas the better and the minor smoke intrusions from prescribed fire are far overshadowed by the heavy intrusions in the summer. Public acceptance of smoke is going to have to happen one way or another but there will be much fewer repercussions from prescribed fire than wildfire. Thanks for the opportunity to comment.

Rick Sohn

Response #29

Thank you for your comment.

Comment #30

I am for relaxing smoke rules in order to remove fuel that can lead to major fires. I have asthma, and am more than willing to be inconvenienced by prescribe burns. I am also a cyclist, and have spend a total or 4 hours on my bike in the last 4 weeks. Prior to the Carr fire, I was driving 2 hours to get to clear air.

John Chapman

Response #30

Thank you for your comment.

Comment #31

I am 100% in favor of controlled burns, locally and elsewhere. The smoke from controlled burns is far less than that of major fires, and controlled burns make it likely that future fires will be less severe.

Controlled burns are the smart thing to do.

Charles Whitaker

Ashland

Response #31

Thank you for your comment.

Comment #32

Increase mowing and thinning. Decrease burning.

George Myers

Response #32

Thank you for your comment. The existing Smoke Management program seeks to implement alternatives to prescribed fire, but is otherwise outside of the scope of this rulemaking. DEQ will continue to investigate and seek the implementation of alternatives to burning, such as biomass utilization for the development of products.

Comment #33

Thank you for this opportunity to comment. Increasing prescribed burning into Oregon's forest is our best opportunity to reduce the hazardous air quality that results from large wildland fires. As a resident of southern Oregon, I believe that smoke from wildland fires is the most oppressive effect of climate change that we are now experiencing. For the past 3 summers, August has become a new season to restrict outdoor activity. I teach a summer field biology class for the local high school, and have had problems with student exposure to smoke (and this year, evacuations due to wildfires). July and August should be the prime months for outdoor activities, so this seems particularly offensive. Besides educational events, tourism and even farmstands are negatively impacted by many weeks of unsafe air. My husband is exposed to unhealthy particulates every working day during smoke season, and suffers from coughing, inflamed eyes, and an increased susceptibility to bronchitis. As a result, we're both very concerned and believe that the best solution is increased opportunities for controlled burns during the winter and spring. We live less than a quarter mile from the Garner Fire complex lines and know firsthand how brushy and overly dense our watershed has become.. Although we applaud the work done along roadsides and close to residential areas for fuel reduction, we have also seen how quickly brush such as poison oak grows back in after that expensive treatment is completed. So as taxpayers as well as citizens who have health concerns with smoke, we feel that increased fire prescriptions are necessary. I do think that language addressing watershed health should be added to balance the emphasis on maximizing burning for commercial timber management. I'm not convinced that huge slash piles that result from clear cuts are beneficial either for the soil, air quality, or reducing the wildfire risks for large plantations of young trees.

Marie Reeder

Response #33

Thank you for your comment. The existing Smoke Management program seeks to implement alternatives to prescribed fire, but is otherwise outside of the scope of this rulemaking. DEQ will continue to investigate and seek the implementation of alternatives to burning, such as biomass utilization for the development of products.

Comment #34

It has been a practice for thousands of years to burn areas when the humidity was high and the temperature low. This is a necessary component of healthy ecosystems in the Western U.S. backed by thousands of years of traditional indigenous ecological knowledge as well as modern science. The suppression of these ways in part is responsible for many of the predicaments we are in, including mega fires and our new, normal smoke season. We need to implement prescribed burns and ecological diversity in a big way.

Robert Fossek II

Response #34

Thank you for your comment.

Comment #35

I believe it's time to make a change to the Oregon Smoke Management Plan. This proposed rulemaking is an excellent plan for moving forward. By providing flexibility for forest land owners to do prescribed burning while protecting public health is a win-win for everybody. Removing excess fuels protects our forests from catastrophic fires that release millions of tons of pollution. This common sense approach accomplishes this goal.

Adam Stinnett

Response #35

Thank you for your comment.

Comment #36

The letter would not copy to this document. The original letter is on file and can be made available upon request. Below is a summary of the letter:

- Supports the alignment of the rules to be consistent with the 24-hr standard, but does not support the 1-hr threshold because the agencies have not supplied the scientific foundation justifying the need for the proposed 1-hr threshold to protect public health and the 1-hr threshold will severely limit burning where they need to accomplish it most, next to communities. Support the exemption process however and the mitigation strategy already being implemented in Deschutes County and across Central Oregon.
- Supports the use of the prescribed burning tool of thinning followed by prescribed fire.

Deschutes County Commissioners

Anthony DeBone, Chair; Philip Henderson; Tammy Baney

Response #36

Thank you for your comment. DEQ encourages the commenter to review comments provide by the Oregon Health authority, which sites multiple papers on the short-term health impacts from smoke. The proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-

hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implementation mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

Comment #37

On behalf of the Deschutes County Rural Fire Protection District #2, we thank you for the opportunity to provide comments to the Oregon Department of Forestry (ODF) and Oregon Department of Environmental Quality (DEQ) concerning the proposed rule changes to Oregon's Smoke Management Plan. This summers' fire season in Oregon and across the West is yet another indication that wildfires are becoming larger, more frequent, and more intense. In Central Oregon, we and our partners are taking proactive steps to reduce the risk of such extreme wildfires, including through the strategic use of prescribed fire in the forests immediately around our communities. We know that to continue this work to significantly reduce wildfire risk to our forests, communities and firefighters, we need a holistic set of smoke management rules in Oregon.

We appreciate the work by ODF and DEQ staff to conduct a robust smoke management review process. We applaud the effort to align Oregon's smoke management rules with the federal Clean Air Act 24-hr National Ambient Air Quality Standards (NAAQS) for fine particulate matter. We believe that using the NAAQS (including the proposed buffer of 75% of the NAAQS to define smoke intrusions addresses our interests in protecting pubic health, minimizing smoke entering communities and allowing critical prescribed burning to occur to address the very real wildfire threat we face.

However, we are concerned that the proposed rules do not appropriately account for the short and long-term consequences of wildfire on our forests, local economies, community safety and public health and wellbeing. For that reason, we have significant concerns with the 1-hour smoke threshold proposed in addition to the 24-hour NAAQS. Experience with prescribed burning around our communities has shown us that this proposed rule will severely limit the very prescribed burning that is most critical to our community wildfire protection efforts. Consequently, our support of the overall smoke management rule package is contingent upon the inclusion of the provision allowing communities a clear and simple process to obtain an exemption from the 1-hour smoke threshold when they have implemented a smoke communication and mitigation plan.

Thank you for the opportunity to provide comment on the proposed rules. The fire-prone forests of Central Oregon will burn sooner or later. Our choice is when and how they will burn: in a controlled way during carefully planned and implemented prescribed fire or during out-of-control wildfires. We believe that the short-term impacts of prescribed fire will be far less than the impacts of wildfire in the long-run and we urge you to adopt the proposed rules so we can do what's needed to protect our forests, communities, and firefighters now and in the future.

Respectfully,

Ray Miao, President, Deschutes Rural Fire Protection District #2

Response #37

Thank you for your comment.

Comment #38

I am firmly against any changes to the smoke management regulations in Southern Oregon. The rogue valley is now getting a reputation of a place to avoid in summer because of smoke. Lets not extend that beyond summer. We all need to get a break from the smoke and fires . My health has been affected the last few summers. And I am a lucky one who can hunker down with a filtered air HVAC house. I recommend more strategic use of existing forest roads made into wider and shoulder thinned logging.

Bryce Leppek

Response #38

Thank you for your comment. DEQ agrees that smoke impacts health, no matter the concentration. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to meet that balance. With the increased potential for smoke entering communities comes the increased need for proactive communications about prescribed fires and their potential impacts. The proposed rules require ODF and DEQ to develop a communication framework for prescribed fires to be used throughout Oregon. This framework will include information that the public can use to protect their health from smoke.

Comment #39

I fully support relaxing smoke rules in order to increase the use of prescribed fires, in particular in the fall and winter

Richard Clayton

Response #39

Thank you for your comment.

Comment #40

I wholeheartedly (and lung-edly) support these changes. They adequately address community concerns regarding air quality by providing a clarified definition of "smoke intrusion" based on the amount of measurable pollutants over time (rather than a simple presence/absence test over the course of an hour). The community notification provisions and involvement of health authorities convince me that these changes will lead to a net decrease in the amount of smoke Oregonians have to breathe over the long term. I am curious as to why the removal of this section is proposed: "In addition, the rules apply to forestland outside any forest protection district in Oregon as described by ORS 527.620(7) at the discretion of the Oregon Department of Forestry and Department of Environmental Quality defined in a joint agreement."

Leigh Ahlgren

Response #40

Thank you for your comment. The proposed edits to OAR 629-048-001 (2) align the rule language of that section with ODF's legal authority.

Comment #41

I am horrified by the idea that controlled burns will send more smoke into our cities. Already, I suffer any time there is a controlled burn which sends smoke into Bend. With news reports talking about increased health problems and deaths from smoke, surely we don't need more.

Elizabeth Stanley

Response #41

Thank you for your comment. DEQ agrees that smoke impacts health, no matter the concentration. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to meet that balance. With the increased potential for smoke entering communities comes the increased need for proactive communications about prescribed fires and their potential impacts. The proposed rules require ODF and DEQ to develop a communication framework for prescribed fires to be used throughout Oregon. This framework will include information that the public can use to protect their health from smoke.

Comment #42

Please allow these changes to the program. This can be one step in the right direction to help manage our forests and allow more control when wildfires to arise.

Skyler Conner-Coash

Response #42

Thank you for your comment.

Comment #43

I support prescribed burning prevention measures. Let's burn out the underbrush during the Spring or Winter. Better a little smoke then, to decrease the intensity and duration of Summer wildfires.

Anonymous

Response #43

Thank you for your comment.

Comment #44

Please do not lessen the restrictions regarding burning and smoke in our area. We have immune impaired individual living in our home and live right against logging land. We already deal with herbicides spread by helicopter, we don't need to add smoke on top of that. In general, our air quality is going down thanks to climate change. It's time to be more rigorous in protecting air quality, not less.

Michelle Clark

Response #44

Thank you for your comment. DEQ agrees that smoke impacts health, no matter the concentration. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health

from prescribed fire smoke. The proposed rulemaking is an effort to meet that balance. With the increased potential for smoke entering communities comes the increased need for proactive communications about prescribed fires and their potential impacts. The proposed rules require ODF and DEQ to develop a communication framework for prescribed fires to be used throughout Oregon. This framework will include information that the public can use to protect their health from smoke.

Comment #45

Utilize fire crews and the tool of prescribed fire in the wet season to reduce fuels for next summer's fire season.

Stuart Smith

Response #45

Thank you for your comment.

Comment #46

The situation with wildfire smoke has become simply untenable for Oregonians, particularly in Southern Oregon. The impact on our physical and mental health is very hard, not to mention the hit our economy takes when we are so reliant on tourism dollars during the summer months. Many residents "save" during this time to get through the dead months in winter. It's time for ODF to take some meaningful, progressive steps in thinning out the dead trees in our forests and ALSO putting out these fires when they start in the first place.

Nicolle Aleman

Response #46

Thank you for your comment.

Comment #47

On behalf of the Central Oregon Fire Chiefs Association we thank you for the opportunity to provide comments to the Oregon Department of Forestry (ODF) and Oregon Department of Environmental Quality (DEQ) concerning the proposed rule changes to Oregon's Smoke Management Plan. This summers' fire season in Oregon and across the West is yet another indication that wildfires are becoming larger, more frequent, and more intense. In Central Oregon, we support our partners who are taking proactive steps to reduce the risk of such extreme wildfires, by implementing the strategic use of prescribed fire in the forests immediately around our communities. To continue this work the Central Oregon Fire Chiefs Association believes in pursuing a holistic and forward-thinking smoke management policy in Oregon.

We appreciate the work by ODF and DEQ staff in leading the smoke management plan review and we applaud the effort to align Oregon's smoke management rules with the federal Clean Air Act 24-hour National Ambient Air Quality Standards (NAAQs). We believe that using the NAAQS (including the proposed buffer of 75% of the NAAQS) to define smoke intrusions strikes an appropriate balance by addressing our shared interest in protecting public health, minimizing smoke entering communities, and allowing critical prescribed burning to occur as we work together to confront the very real wildfire threat facing our communities. Increasing the pace and scale of prescribed burns creates a safer environment for the public we serve who live in the Wildland Urban Interface and firefighters to carry out their suppression activities.

For this reason, we have significant concerns with the 1-hour threshold, which runs counter to our interest in a smoke management policy that accounts for the short and long-term consequences of wildfire. Data shows that the I-hour threshold

would impose a significant limitation on the very prescribed burning priority areas that are most critical to our community wildfire protection efforts here in Central Oregon. The ability, or lack thereof, to implement prescribed fire in strategic areas in the Wildland Urban Interface in our community has a direct impact on life safety for our personnel and constituents.

Consequently our support for smoke management rule package is contingent upon the inclusion of the provision providing communities a clear, simple, and attainable process to obtain an exemption from the 1-hour smoke threshold when they have implemented a smoke communication and mitigation plan.

Thank you for the opportunity to provide comment on the proposed rules. The fire-prone forests of Central Oregon will burn sooner or later. Our choice is when and how they will burn: in a controlled way during carefully planned and implemented prescribed fire or during out-of-control wildfires. In light of the science on this topic, we believe that the short-term impacts of prescribed fire will be far less than the impacts of wildfire in the long-run and we urge you to adopt the proposed rules so we can do what is needed to protect our forests, communities, and firefighters now and in the future.

Central Oregon Fire Chief's Association membership includes: Alfalfa Fire District, Bend Fire & Rescue, Black Butte Ranch Rural Fire Protection District, Cloverdale Rural Fire Protection District, Crook County Fire & Rescue, Crooked River Ranch Rural Fire Protection District, Deschutes County, Deschutes Country Rural Fire Protection District #2, La Pine Rural Fire Protection District, Oregon Department of Forestry, Oregon Military Department, Redmond Fire and Rescue, Sisters Camp Sherman Rural Fire Protection District, Sunriver Fire Department, Lake Chinook Fire Department, Crescent Rural Fire Protection District, Walker Range Rangeland Patrol Association, and Warm Springs Fire & Safety.

Matt Smith, Central Oregon Fire Chiefs Association

Response #47

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implementation mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

Comment #48

I am in complete support of the modifications, but actually think they do not go far enough to enable prescribed burns to reduce potential wildfire fuels. Smoke and particulates from wildfires dramatically exceed these levels for days and weeks during the season. There is little to indicate the number and scale of wildfires is going to diminish going forward. By comparison, the smoke from prescribed burns is relatively inconsequential. Ben Franklin's aphorism got this one right: "An ounce of prevention is worth a pound of cure." We actually need much more aggressive fuel reduction management, and modified regulations to make that possible.

Mark Smolenski

Response #48

Thank you for your comment.

Comment #49

I'm concerned that in our haste to lessen wildfires and smoke, we have begun a type of mass hysteria or collective obsessional delusional behavior. If you step back and think about it, forest thinning or slash- and-burn as we used to say or logging the watershed plans that are being put forward as a solution to wildfire is the same as spreading out the burning to year around so that the smoke is diluted and that when the forest conflagration does come it burns a little slower. Perhaps. There are scientific studies that show that this unnatural management actually makes things worst. But leaving that argument aside, what this scenario leaves out is that we are not living in the 1960s. Climate scientists say we are already in human- caused climate change now and the increased temperatures and drought we are suffering now are a major cause of the horrific wildfires burning here in the West. The scientists further say that to have any chance for our society to survive, we can't put ANY MORE carbon dioxide into the atmosphere. Forest thinning does the opposite of that. Get your mind around that - if we go forward with this we are guaranteeing our demise. Fine, you say. What do you propose? Are starters and at a minimum, I propose that our elected representatives as an emergency measure NOW in a bi-partisan effort triple current funding for firefighting efforts: tripling the number of firefighters on the ground and in the air who are dedicated to one thing - putting fires out as soon as they start. And in their downtime they can plant more trees to put oxygen back into the air. And how do we pay for this? How about instead of paying for a 14th aircraft carrier at $13 billion we shift the money to this? How about taking back the $1.5 trillion tax break we gave to the already richest people in the world?

John Anastasio

Response #49

Thank you for your comment. The existing Smoke Management program seeks to implement alternatives to prescribed fire, but is otherwise outside of the scope of this rulemaking. DEQ will continue to investigate and seek the implementation of alternatives to burning, such as biomass utilization for the development of products, grazing, etc.

Comment #50

More than 30 years of field experience have taught me: Habitat restoration involving controlled burns result in unacceptable atmospheric conditions during the early years. But, as the process evolves over time the controlled burns become cleaner, easier to control, and much less intense by various measures. Fire Science is Complex in its Details (I am not a biologist) but Straightforward Conceptually (I am a physicist). Selective Thinning and Prescribed Burns designed to create a resilient, sustainable ecosystem are feasible, desirable, and imperative as a response to the ongoing disastrous Anthropogenic Climate Change. Industry-Oriented Harvesting and Cropping Practices have been undeniable failures creating conditions that intensify forest fires into conflagrations killing rather than reinvigorating our vital forest ecologies. A variegated population unique to each part of the ecology is vital … literally. Only with well vetted science and proper funding will we be able to reverse decades of malpractice and economic greed. Regulators need to fine tune their regulations to influence individuals (and through them agencies and corporations) to do "right" by the forest. Unfortunately, an Insidious Lie has become Endemic in public discourse. The false notion that Federal Taxes fund Federal Programs has lead to stifling needed scientific research, institutional regulation, and project development nationwide. Speaking as a Scientist, I am appalled by the actions of politicians and corporation owners that have, through willful ignorance, created the present crisis.

Robert I. Price, PhD

Response #50

Thank you for your comment.

Comment #51

I am in favor of your proposed amendments regarding prescribed burns in Jackson County. I believe amending the Smoke Management Plan and allowing more prescribed burns will reduce some incidence of high intensity wildfires.

Susan Stone

Response #51

Thank you for your comment.

Comment #52

Please no more burning! Forests can be thinned with wild mustang horses and logging. Medford is filled with toxic smoke year round. I am suffering terribly and cannot afford to move. Ask anyone in Medford how horrible this smoke has been. Medford is in a small valley and with air inversion, the smoke just hangs over Medford. I am 70 years old and have been a prisoner in my house due to all of the toxic smoke.

Anita O'Rourke

Response #52

Thank you for your comment. DEQ agrees that smoke impacts health, no matter the concentration. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. With the increased potential for smoke entering communities comes the increased need for proactive communications about prescribed fires and their potential impacts. The proposed rules require ODF and DEQ to develop a communication framework for prescribed fires to be used throughout Oregon. This framework will include information that the public can use to protect their health from smoke.

Comment #53

I am an Extension Forester with Oregon State University and a member of the Southern Oregon Forest Restoration Collaborative. I have more than 20 years of experience in forest management in western Oregon. My comments in this letter represent my personal views.

I appreciate that the fact that ODF and DEQ are considering revisions to the rules regarding prescribed fire and smoke. Reducing net aggregate smoke impacts from wildfires and prescribed fire is a critical public health issue. Here in the Rogue Basin we have suffered through two consecutive summers of horrendous wildfire smoke from local and regional wildfires. Unfortunately, given the facts that our dry, fire-prone forests have experienced an unnatural buildup of fuels over the past century, and that the climate is warming, it is certain that more large, hard to control wildfires will occur in the future.

What can we do about this? We will continue to suppress summer wildfires, but this alone won't be enough. The best available science as well as ample recent experience around the western United

States demonstrate that forest restoration treatments, including thinning followed by prescribed burning, can significantly reduce the intensity and duration of summer wildfires, with reduced negative impacts to forests and communities, including less smoke production.

Prescribed burning is an essential tool for fuels reduction, and we need to greatly increase the use of prescribed fire to accomplish our restoration goals. However, there are many constraints on the use of prescribed fire, including the current smoke rules which greatly limit available burn windows. While increasing the use of prescribed fire will unavoidably result in some smoke impacts, the potential benefits include greater protection of communities, reduced fire severity, and fewer future summer smoke emissions in the long run.

In revising Oregon's smoke management rules, I urge you to consider these tradeoffs between short term reductions in air quality occurring with prescribed burning, with the potential for long term air quality improvements resulting from increased use of prescribed fire in the context of forest restoration. I believe we need increased flexibility and opportunity to implement prescribed fire in prioritized high-risk and high- value treatment areas. This includes aligning Oregon's smoke policy with EPA's 24-hour air quality standard and eliminating the one-hour smoke threshold in the proposed new rules, or, at a minimum, creating a process for exemption from the one-hour standard.

Thank you.

Max Bennett

Response #53

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implementation mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

Comment #54

RE: Support for the proposed smoke management rules, contingent upon the inclusion of the provision allowing an exemption from the 1-hour smoke threshold.

Dear Jenna,

I support, and urge the State to adopt, the proposed smoke management rules with an exemption from the 1-hour smoke threshold in communities where prescribed fire smoke communication and mitigation plans are adopted.

I have personally been involved with a prescribed burn on private land and have seen firsthand the benefits that this fire mitigation provides in helping to make our forests healthier, reduce the wildfire risk to communities and our fire fighters, and protect our wildlife habitat, our recreation areas, and timber.

Prescribed burning is one of the most effective fuel treatments in our forests. I've learned through the Deschutes Collaborative Forest project that reducing Wildfire severity reduces amount of material burned per acre, which has been linked to the higher concentrations of wider range of pollutants found in wildfire smoke than prescribed fire smoke.

All Oregonians have been subjected to wildfire smoke at dangerous levels and for extended periods of time over the last several years due to wildfires burning hotter and longer than in the past. With the absence of consistent and successful fire fuel mitigation work in our forests, we are suffering on many levels.

I strongly support the use of prescribed burning to mitigate fire fuels and have first-hand experience with a successful prescribed burn on private land in Bend, OR at The Tree Farm in 2015. The impacts to a community from prescribed burns are minimal in comparison to the impacts resulting from wildfires in our forests. Forest thinning followed by prescribed burning strategic areas has been shown to reduce future wildfire severity. This is a goal we all share.

Thank you for accepting my support for important changes to the rules governing prescribed fire smoke.

Romy Mortensen, Brooks Resources

VP, Sales and Marketing for Brooks Resources Corporation

Project Manager and Firewise Committee Member, The Tree Farm

Central Oregon Cohesive Strategy Advisory Board Member

Response #54

Thank you for your comment.

Comment #55

I would like to comment in support of allowing regulations to be changed to allow more prescribed burns.

Elizabeth Weltin

Response #55

Thank you for your comment.

Comment #56

Oregon has about 6,500 mountain lions that are eating a lot of the deer which used to eat the fire fuels. We need to thin out the mountain lions which have been protected for decades. I was born and raised in Southern Oregon and this horrible smoke in recent years needs to be abated. With 32 million acres of forests, we need to bring in the wild mustang horses to eat the brush until the deer and elk populations can be rebuilt. Stop the burning. The smoke is killing us in Medford. Most of us cannot afford to move.

Who is going to pay the medical bills for all of the damage to our bodies from all of the smoke? Put the fires out! Stop this "let it burn" policy!

Anita O’Rourke

Response #56

Thank you for your comment. DEQ agrees that smoke impacts health, no matter the

concentration. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. With the increased potential for smoke entering communities comes the increased need for proactive communications about prescribed fires and their potential impacts. The proposed rules require ODF and DEQ to develop a communication framework for prescribed fires to be used throughout Oregon. This framework will include information that the public can use to protect their health from smoke.

Comment #57

In support of the proposed changes. By allowing more flexibility for the ODF prescribed burn techniques, our overall forest health may improve.

Nicole Mardell

Response #57

Thank you for your comment.

Comment #58

I write as co-facilitator of Southern Oregon Climate Action Now, an organization of over 1400 Southern Oregon who are concerned about global warming and its climate change consequences. I also write as a retired ecologist and conservation biologist at Southeast Missouri State University who has spent considerable time undertaking restoration and conservation research in the bottomland hardwood forests of Southeast Missouri and tropical moist forests of Northwestern Costa Rica.

Our concern relates both to the impact of climate change on forests and the potential impact of forests on climate change through their capacity to store carbon.

In relation to the smoke proposal, three critical considerations concerning the forests of Southwestern Oregon are important to appreciate:

Mediterranean climates around the world are characterized by winter wet / summer dry conditions. As a result, soil conditions inevitably dry out towards the end of the growing season. Vegetation communities, having developed under that set of growing conditions with the high inevitable fire frequency that such situations produce, are fire-prone, fire-adapted, and fire- dependent. This means that the maintenance of healthy resilient forest in SW Oregon requires the relatively frequent intervention of fire. Indeed, prior to the imposition of fire suppression some

80 years ago, the median fire return interval in the dry forests of SW Oregon, was some 8 - 10 years. This means that 100 years ago, all other things being equal, some 10 - 12.5% of the forests burned every year. Interestingly, according to then Forest Supervisor Rob MacWhorter, during the purportedly bad fire year of 2017, some 14.5% of the Rogue River-Siskiyou National Forest burned, an area not substantially different from possible historic values. The implication is that current fire losses (in terms if area burned) are comparable to those prior to fire suppression, even as fire suppression is still in effect. Probably for the reasons discussed under 3 below, it seems fire suppression is no longer a viable mechanism for reducing fire risk / fire losses even if it were advisable.

The evidence indicates that since fire suppression has been imposed on these forests, the structure and composition has adjusted substantially. As a result of fire suppression, fire intolerant, shade tolerant species such as Douglas fir and White fir have been able to invade and produce an unusually dense understory / sub-canopy. This changes the response of the forest to fire. Previously, with open forests, fires tended to be low intensity ground fires burning the grassland and eliminating seedling trees thus maintaining the open understory. With increased seedling density, the potential for ground fire to

climb into the canopy has increased thus turning relative low smoke ground fires into crown fires that generate more smoke. The impact of this transition is a shift from fire tolerant to fire intolerant species.

But, from the perspective of this issue, the transition from less to more smoke production is relevant. As suppressing fire suppression has become ever more difficult as a result of global warming, the increasing fire risk is resulting in more smoke. Restoring fire to the system during seasons when fire is not historically as frequent may nit be the perfect solution since fire at different seasons than those historically experienced will likely have an unknown and slightly different ecological consequence. But, given that we cannot eliminate humans from the region, and the extensive summer smoke poses serious health and economic consequences, the implication is that we should do that which is likely to cause the least harm.

The third issue of great importance is the trend in global warming. As warming has continued (especially during the last 4 - 5 decades), a range of climate consequences follow that increase fire risk. These include a reduction in high elevation snowpack that reduces river flow during late summer and fall, advancing spring snowmelt causing late summer water flow even further. Adding to this, the higher summer temperatures ae inducing greater evaporation again leading to increased evaporative deficit and thus reduced soil moisture. The result of these trends is drying soil and vegetation. Once fire is initiated, whether by natural or human causes, the result increasing the risk of higher intensity fires. The result of the global warming trend is the increase of fire risk which means unless we address global warming, the potential for increased fire risk is inevitable meaning suppressing fire would be ever more difficult and untenable as a strategy.

The point is that fire is an essential and inevitable component of our SW Oregon forests. Even if fire suppression were achievable, it would have a negative impact on our forests. Fire suppression would further enhance the invasion of fire intolerant / shade tolerant species to the detriment of some critical species in our regional forest association with decreased viability of native fire tolerant / shade intolerant species.

From an ecological perspective, this means it is critically important to maintain fire in the forest and restore it where it has been suppressed. As a consequence, we must recognize the need to impose management on our forests that allows the reintroduction of fire. The question is: How?

One option is to manage those fires that occur in such a way that they impose minimal threat to human life and infrastructure.

For this reason, I support the proposal to adjust the particulate matter standards to allow more extensive use of controlled fire. However, I note the following:

The proposal comprises a 1-hour 70 μg/m3 standard and a 24-hour 26 μg/m3 standard. I note that the California Air Resources Board standards for Pm 2.5 Annual average are12 μg/m3 and the 24 Hour Average is non-existent (https://www.arb.ca.gov/research/aaqs/pm/pm.htm). Meanwhile, Federal EPA standards are 24-Hour Average 35 μg/m3 with an annual average of 12 μg/m3. https://www.epa.gov/criteria-air-pollutants/naaqs-table)

Meanwhile, according to the Jackson County Health and Human Services Climate and Health Action Plan (https://www.oregon.gov/oha/ph/HealthyEnvironments/climatechange/Documents/AdaptationPlans/adaptation-plan-jackson.pdf), Unhealthy conditions for an hourly count are defined as 94.3 to 120 μg/m3 whereas Very Unhealthy conditions are 120.1 - 250 μg/m3 which suggests that the proposal for μg/m3 is rather arbitrary. Since the purpose of the proposal is to permit prescribed burns that, in the long term, would reduce extended wildfire incidents and the seriously compromised air quality that such events impose, it would seem appropriate either to eliminate the 1-hour standard, or raise it to a value defined as hazardous (250 μg/m3) since short-term exposure (especially when residents are warned ahead of time that such conditions are likely and they can plan accordingly) is less serious than long-term exposure. It would seem illogical to set the one-hour standard at such a low level that it precludes the imposition of controlled fire even on the limited number of occasions when all other necessary conditions are

favorable.

Respectfully Submitted

Alan Journet, Southern Oregon Climate Action Now

Response #58

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implementation mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

Comment #59

As a resident of Southern Oregon, I would like to submit comments on proposed changes to the smoke management rules, under OAR 629-048. While the use of prescribed fire should be used as a tool to reduce the wildfire risks we face annually, areas of concern must be shared with the planning and approving agencies.

As 2018 has starkly illustrated, it is imperative we address the issue of public health as it relates to wildfire smoke. Living in the smoke for weeks, nearly without end, made it contrastingly clear that we must be proactive to preserve the quality of life so vital to us all. By working with federal, and other state agencies as well as landowners and interested organizations, ODF must pursue science-based and common sense rules that allow prescribed burning use in our forests and wildlands to manage fuels which otherwise become kindling for wildfires. This is not only essential for protecting communities but also for long term forest health. I am concerned that a 1-hour threshold limits the amount of prescribed burning; it will impose unnecessary restrictions on critical prescribed burning priority areas.

While sitting at a public hearing in Medford I heard a few members of the public lauding logging as the answer to wildfire hazards. I'm not against logging (I live in a wood frame house), but it is clear that nearly two centuries of logging have not reduced our fire hazard. One of the contributors of logging to wildfire is the slash left behind. This slash must be managed to reduce its footprint as a fire hazard and potential smoke problem. One idea that I frankly know little about is the use of biochar as method of burning slash. Please consider other methods of reducing slash piles in the forest. One point here is ODF's proposal to use polyethylene plastic for curing burn piles. While I'm not a scientist, use of a hydrocarbon material just seems like a bad idea. How about using materials such as "kraft" paper to keep piles dry before ignition? Let's reduce our use of oil-based solutions as much as possible.

A big concern I have is the outreach component of this rule change. It is good to know ODF feels public information is an important aspect of success. However, it is unclear how this will be funded to achieve its goals of notifying residents of the purpose and importance of prescribed burning, the health risks of wildfire and prescribed fire smoke. Local officials and the public must have a straight forward way to find out about daily burn plans and emission reduction actions in their area. This should include notifications when smoke is anticipated to enter smoke-sensitive areas. How will community response plans be funded? Please make every effort to keep the public informed on the beneficial use of prescribed fire.

Manuel De Aquino

Response #59

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implementation mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

DEQ also encourages the commenter to review the research paper provided in the EQC briefing for this proposed rulemaking.

Comment #60

Dear Oregon Department of Forestry and Department of Environmental Quality:

To reduce the fire risk to communities, I would like to write in support of rules changes that would allow for more controlled burning flexibility during the spring and winter. Citizens in the Rogue Valley are depending on land managers to use every tool available for the health of our forests.

Thank you for considering rule changes which favor keeping important land management practices more available sour communities can enjoy intact habitats and beautiful landscapes that deliver our drinking water.

Sara Jones, City of Ashland Fire & Rescue

Response #60

Thank you for your comment.

Comment #61

I strongly support revision of OAR 340-200-0040 in order to facilitate more controlled burning. A nominal and manageable amount of smoke during the cooler seasons is a very small price to pay in exchange for unhealthy volumes of smoke and unmanageable wildfires during the summers. Further, I believe additional controlled burns will not only contribute to long-term achievement of DEQ's air quality standards, but will also contribute to the long-term achievement of DEQ's water quality standards as they pertain to sediment and turbidity. We've certainly learned by now that destructive wildfires denude the landscape and ultimately contribute to landslides and smaller-scale mobilization of sediment from uplands into Waters of the State. The restrictive air quality standards currently in effect are pointless and even counter-productive when they contribute to further degradation of air quality and water quality.

Kaylea Kathol

Response #61

Thank you for your comment.

Comment #62

Starker Forests, headquartered in Corvallis, Oregon strongly supports the Oregon Smoke Management Plan proposed rule changes. These are common sense changes that should allow us to get more fuel reduction accomplished via prescribed fire, reducing the risk of much more damaging wildfire.

Gary Springer

Response #62

Thank you for your comment.

Comment #63

On behalf of the Deschutes County Public Health Advisory Board, we thank you for the opportunity to provide comments to the Oregon Department of Forestry (ODF) and Oregon Department of Environmental Quality (DEQ) concerning the proposed rule changes to Oregon's Smoke Management Plan.

Once again, this summer's fire season in Oregon and across the West is yet another indication that wildfires are becoming larger, more frequent, and more intense. The trend is clear and it's imperative we acknowledge this fact and plan accordingly. We need only to look at our southern neighbor in California which is experiencing its second record setting year in a row of acreage burned with homes destroyed and lives lost, including eleven firefighters to date this year. Consequently, this is much more than a public health issue, it's a major public safety issue too. Central Oregon contains some of the most dangerous wildfire risks in the state, if not the west, with a populated center abutting a heavily forested area posing imminent danger of a wildfire running into town the same way it has happened in Santa Barbara, Santa Rosa, Redding and Lake Elsinore in California. It should be stressed, too, that the health impacts of controlled burns are magnitudes smaller than that posed by recent local fires such as the Mille Fire last year or the Substation Fire this year.

In Central Oregon, we and our partners are taking proactive steps to reduce the risk of such extreme wildfires, including the strategic use of prescribed fire in the forests immediately around our communities. To continue this work we need a holistic and forward-thinking smoke management policy in Oregon.

We appreciate the work by ODF and DEQ staff in leading the smoke management plan review and we applaud the effort to align Oregon's smoke management rules with the federal Clean Air Act 24-hour National Ambient Air Quality Standards (NAAQs). We believe that using the NAAQS (including the proposed buffer of 75% of the NAAQS) to define smoke intrusions strikes an appropriate balance by allowing critical prescribed burning to occur as we work together to confront the very real wildfire threat facing our communities.

For this reason, we have significant concerns with the 1-hour threshold, which runs counter to our interest in a smoke management policy that account for the short and long-term consequences of wildfire. Data shows that the 1-hour threshold would impose a significant limitation on the very prescribed burning priority areas that are most critical to our community wildfire protection efforts here in Central Oregon.

Consequently, our support for smoke management rule package is contingent upon the inclusion of the provision providing communities a clear, simple, and attainable process to obtain an exemption from the 1-hour smoke threshold when they have implemented a smoke communication and mitigation plan.

Thanks you for the opportunity to provide comment on the proposed rules. The fire-prone forests of Central Oregon will burn sooner or later. Our choice is when and how they will burn: in a controlled way during carefully planned and implemented

prescribed fire or during out-of-control wildfires. In light of the science on this topic, we believe that the short-term impacts of prescribed fire will be far less than the impacts of wildfire in the long-run and we urge you to adopt the proposed rules so we can do what is needed to protect our forests, communities, and firefighters now and in the future.

Keith Winsor, Deschutes County Public Health Advisory Board

Response #63

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implementation mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

Comment #64

I am writing to express my support for proposed changes in Oregon's Smoke Management Plan. I am retired after a career in federal land management, focusing on the use of fire in restoring ecosystems, and over my career I have seen first-hand the lost opportunities for the use of fire because of the potential for putting "nuisance" smoke into communities. I have seen these very same communities subject to weeks on end of unhealthy air due to wildfires in the summer. The irony is the trade-off was obvious – a small amount of smoke from prescribed fires in the spring, or heavy concentrations of wildfire smoke for longer periods of time.

I believe that the use of the NAAQS standard to define smoke intrusions is reasonable and workable for all parties. Therefore, I am not in favor of the proposal to use a 1-hour threshold to define an intrusions. Communities need to have a process in place to seek an exemption to this standard, in order to accomplish more prescribed burning.

The research on the relationship between thinning, prescribed fires, and wildfires is rich with good lessons for land managers. One of these lesions is that thinning alone, without the use of prescribed fire in fire-adapted forests types, does little to reduce the risk of large, high-intensity, long-duration fires – the very fires that create unhealthy air. The backlog of prescribed burn acres after thinning is almost overwhelming, and I encourage you to do all possible to reduce the barriers to eliminating this backlog.

Lastly, we need recognize that it is a false choice to place wildfires against prescribed fires. It is not an either/or situations, as we will continue to have wildfires and prescribed fire. The target should be to change the proportion of wildfire and prescribed fire acres, and the health effects of smoke produced by all fires. In this way, we can have more prescribed fire with light smoke over short periods of time, and helping to restore forests, along with lower-intensity, less smoke-producing wildfires that accomplish many of the same objectives. That is a sound, modern, scientifically-informed fire management strategy.

William Aney

Response #64

Thank you for your comment.

Comment #65

I am writing to express my support for proposed changes in Oregon's Smoke Management Plan. I am retired after a career in federal land management, focusing on the use of fire in restoring ecosystems, and over my career I have seen first-hand the lost opportunities for the use of fire because of the potential for putting "nuisance" smoke into communities. I have seen these very same communities subject to weeks on end of unhealthy air due to wildfires in the summer. The irony is the trade-off was obvious – a small amount of smoke from prescribed fires in the spring, or heavy concentrations of wildfire smoke for longer periods of time.

I believe that the use of the NAAQS standard to define smoke intrusions is reasonable and workable for all parties. Therefore, I am not in favor of the proposal to use a 1-hour threshold to define an intrusions. Communities need to have a process in place to seek an exemption to this standard, in order to accomplish more prescribed burning.

The research on the relationship between thinning, prescribed fires, and wildfires is rich with good lessons for land managers. One of these lesions is that thinning alone, without the use of prescribed fire in fire-adapted forests types, does little to reduce the risk of large, high-intensity, long-duration fires – the very fires that create unhealthy air. The backlog of prescribed burn acres after thinning is almost overwhelming, and I encourage you to do all possible to reduce the barriers to eliminating this backlog.

Lastly, we need recognize that it is a false choice to place wildfires against prescribed fires. It is not an either/or situations, as we will continue to have wildfires and prescribed fire. The target should be to change the proportion of wildfire and prescribed fire acres, and the health effects of smoke produced by all fires. In this way, we can have more prescribed fire with light smoke over short periods of time, and helping to restore forests, along with lower-intensity, less smoke-producing wildfires that accomplish many of the same objectives. That is a sound, modern, scientifically-informed fire management strategy.

Monte Dammarell, Upper Deschutes River Coalition

Response #65

Thank you for your comment.

Comment #66

The Sisters Area Chamber of Commerce writes in strong support for the adoption of the national Environmental Protection Agency's 24 hour air quality standards.

We stand in opposition to the addition of a one hour intrusion standard that has no scientific basis and has the almost certain potential to reduce the amount of prescribed fire that can be implemented to reduce the threat of wildfires in the wildland urban interface, including to our infrastructure, residents, visitors and emergency services personnel.

As you may know, Sisters economic engine is tourism and we strongly encourage the committee to consider the Oregon Smoke Management Plan to follow federal standards under the Clean Air Act and the 24-hour National Ambient Air Quality Standards.

Thank you for all you are doing on the proposed rule changes and for the opportunity to comment on those

changes.

If you have any questions please feel free to contact me at my Sisters, Oregon office.

Judy Trego, Sisters Area Chamber of Commerce.

Response #66

Thank you for your comment. DEQ agrees that smoke impacts health, no matter the concentration. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to meet that balance. With the increased potential for smoke entering communities comes the increased need for proactive communications about prescribed fires and their potential impacts. The proposed rules require ODF and DEQ to develop a communication framework for prescribed fires to be used throughout Oregon. This framework will include information that the public can use to protect their health from smoke.

Comment #67

Prescribed Fire Letter of Support To Whom It May Concern: Thank you ODF and DEQ for the opportunity to comment on the proposed changes to the Oregon Smoke Management Plan. The 2018 fire season shows yet again that we need to increase the use of prescribed fire on our forested landscapes, especially near our homes and communities. A rule change that facilitates more prescribed burning across land ownerships will reduce the amount of fuels contributing to large scale intense wildfires. Prescribed fire provides an essential tool to take proactive steps to reduce the fire hazard around communities and restore forest conditions, especially in light of climate change. I support the work by ODF and DEQ in providing public meetings and comment opportunities. I support the agencies work to align Oregon's Smoke Management Rules with the Clean Air Act 24-hour National Ambient Air Quality Standards (NAAQS). It is important to maintain a balance between public health and reducing fire hazards in the lands that surround our homes and communities. I am concerned that the proposed 1-hour threshold limits the amount of prescribed burning conducted. This will impose unnecessary restrictions on critical prescribed burning priority areas that are most vital to reducing smoke effects from wildfires here in Southwest Oregon. I support a clear, simple, and attainable process to obtain an exemption from the 1- hour smoke threshold when communities have implemented a smoke communication and mitigation plan. Many of the fire prone forests of southern Oregon are arranged in a checkerboard ownership pattern with industrial land interwoven with Southern Oregon BLM Lands. Industrial timber plantations have been proven by science to burn faster, hotter, leading to more smoke production than natural forests. In addition to increasing prescribed fire and slash disposal, ODF should consider rules to ensure that private industrial forest practices do not increase future fire hazards and smoke production by limiting clearcutting and the production of activity slash. Also, aerial herbicides application and the practice of "hack and squirt" can cause widespread hardwood die-off, leaving senescent, dry vegetation on site and increase fire hazards on the landscape. I support the development of a community response plan that works with the community to determine its contents. We support the objectives of notifying residents of

(1) the purpose and importance of prescribed burning, (2) the health risks of wildfire and prescribed fire smoke, (3) how local officials and the public can find out about daily burn plans and emission reduction actions in their area, and (4) notification of smoke anticipated entering into specific sensitive smoke areas. I would like to see ODF, DEQ, and federal agencies do an assessment of kraft paper as an alternative to polyethylene plastic for curing burn piles. Kraft paper is a cleaner, less toxic burning alternative. Burning polyethylene is a health hazard to crews and the public. We can reduce public health impacts and encourage prescribed burning by using slash paper instead of polypropylene to

keep slash piles dry before their ignition date. I would also like to see ODF encourage the production of biochar in project as this method of burning can store far more carbon. As the affected public I have a vested interest in providing these comments to influence when and to what degree the lands within Southwestern Oregon will burn. Using prescribed fire in forest restoration projects under the correct weather conditions will allow smoke to penetrate into the atmosphere and not remained trapped, as it often does in the summer months. I would like ODF and DEQ to fund more weather balloon launches on burning days to help accurately understand the burning conditions of the geographically complex and rigid mountains and valleys of southern Oregon. A balloon launch from a single point in Medford is unlikely to provide substantive data to be able to accurately identify favorable atmospheric conditions for prescribed burning opportunities for the Applegate Valley, or the Upper Rogue, or the Illinois valley. I believe the short term impacts of prescribed fire will be far less than the smoke impacts of wildfire during hot and dry conditions when atmospheric temperature inversions trap smoke in the valley. Prescribed burning can offset the amount of fuels available when wildfire does strike in subsequent years. Sincerely

Barbara Allen

Response #67

Thank you for your comment.

Commenters #68 – 79, (same as Comment 66: Kevin Silvey, Eilenn Chieco, Robert Kaminski, James Lonergan, Alice Chung-MacCoubrey, Ashley Merrill, Line Ringgaard, Marie Wakefield, Robert Helm, Raja Anderson, Jan Rice, and Marion Hadden)

Response #68 – 79

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implementation mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

DEQ also encourages the commenters to review the research paper provided in the EQC briefing for this proposed rulemaking.

The existing Smoke Management program seeks to implement alternatives to prescribed fire, but is otherwise outside of the scope of this rulemaking. DEQ will continue to investigate and seek the implementation of alternatives to burning, such as biomass utilization for the development of products, grazing, etc.

Comment #80

Yes, we need much more control burns in the wet season, but I'm concerned about the 1 hour

measurement will limit opportunities. Thank you

Susie Stevens

Response #80

Thank you for your comment.

Comment #81

DEQ needs to loosen restrictions on prescribed burned so that we can reduce fuel loading when atmospheric conditions are favorable. It may make for a few smoky days in spring and fall, but will contribute greatly lessening wildfire risk overall and the weeks of unhealthy smoke that come with summer wildfires.

Jason Clark

Response #81

Thank you for your comment.

Comment #82

Prescribe fire to allow for fuel reductions in the forest understory. Focus fuels reduction and thinning projects near homes and communities. Protect big fire resilient trees from logging. Refrain from post fire logging and allow forests to naturally heal after wildfire. Avoid replanting dense single-species tree farms that may increase fire hazard. Retain undisturbed backcountry wildlands. Reduce the legacy sediment impacts of logging road networks. Thank you.

Matt Witt

Response #82

Thank you for your comment.

Comment #83

Spent 2 weeks this spring in Bend, OR area where managed burns were operated most every day. Made a lot of sense!

Bon Kuppler

Response #83

Thank you for your comment.

Comment #84

There should be no time limitation on the burning. Also we need to re-open road access to these areas to facilitate access all year long and provide fire breaks. Trials need to be upgraded and maintained for public and fire access.

Robert Moore

Response #84

Thank you for your comment.

Comment #85

Thank you ODF and DEQ for the opportunity to comment on the proposed changes to the Oregon Smoke Management Plan. The 2018 fire season shows yet again that we need to increase the use of prescribed fire on our forested landscapes, especially near our homes and communities. A rule change that facilitates more prescribed burning across land ownerships will reduce the amount of fuels contributing to large scale intense wildfires. Prescribed fire provides an essential tool to take proactive steps to reduce the fire hazard around communities and restore forest conditions, especially in light of climate change.

Harry Brindley

Response #85

Thank you for your comment.

Comment #86

To Whom It May Concern,

I grew up in Southern Oregon and we never had rampant fires and smoke that lasted all Summer.

Contributing factors to a sustained fire season are multiple years of drought, and yes to a lesser extent a denser forest, but we also have new 'extensive' lightning storms in our region that ignite the forests, also a product of global climate change, and also new to this valley.

I strongly oppose any rule change that facilitates more prescribed burning across land ownerships or in public lands. Lightning is indiscriminant, and to think that we can thin the entire forest to somehow magically reduce wildfires is to not see how vast the forests that surround us actually are.

We who live in the Rogue Valley suffer through the smoke choked summer to enjoy the months when it is not smoky. Many people I know are talking about moving because of the summer smoke. If that smoke continues through fall and spring they will certainly leave. Yes, summer smoke affects our tourist economy, but a mass exodus of residents due to year round smoke will certainly have a more profound affect.

The idea of sending up weather balloons to predict where and for how long the smoke will go in any certain direction is understandable, but wind is fickle and a reason why some 'controlled' burns get out of control. I can't tell you how many days the Rogue Valley sat in smoke last spring and fall, and quite frankly, we had enough smoke and no one was happy about the extra helping.

Allocating funds to thin forests in hopes of stopping summer smoke or wildfires in dense steep Roadless areas is futile and expensive in a time when we cannot even balance our school budgets. And denuding the surrounding forests around town eliminates wildlife habitat and corridors (unless done properly, which it's not) and so we get a large number of wildlife in town which presents its own problems.

This is arguably a very complex topic, but it is also one that can be addressed logically and without enormous resource allocation.

Everyone now acknowledges that the forests are 'too dense' and that it is a bi-product of anti-

logging activism and 100 years of fire suppression. It is time for Conservatives and Activists to meet in the middle on this issue. Helicopter thinning of medium sized trees in our 'too dense' forests should be allowed, and because everyone thinks that fires are happening because of 100 years of fire suppression. Stop suppressing the fires. Let them burn in areas that aren't affecting homes and businesses. Everyone is talking about how bad fire suppression is, and yet Millions are currently being spent on suppressing these very fires that surround us.

As harsh as this policy may sound, it is the best financial and ecologically correct decision to make. Yes we will still have summer smoke, but as our forest thin, so will the smoke that we all now breathe.

Thomas Sager

Response #86

Thank you for your comment.

Comment # 87

Industry led harvesting and cropping practices don't seem to be invigorating our vital forest ecologies. Together with current warmer and drier summers they have created conditions that intensify forest fires. And esthetically and effectively, clearcutting clearly is not a good solution. Citizens, forest industry and government bodies in charge of forests, all need to take this opportunity to cooperate to manage the forests with the realities of a warmer, drier climate and potentially ever-increasing fires foremost. This will cost everyone something. Citizens must understand that preventive burnings may be one of the solutions chosen. Care can and must be taken to minimize the possibility that smoke will accumulate in populated areas with the burns. Industry must harvest trees with both forest preservation and fire suppression a priority. And forest governing bodies must manage forests with preservation and fire and smoke suppression the priority, and, since industry will naturally consider profits first, tree harvesting for profit must be only a secondary consideration.

Robert Simpson

Response #87

Thank you for your comment.

Comment #88

We need to restore our degraded forests. We need more science based restoration including prescribed burns in wetter seasons.

C.A. Incze

Response #88

Thank you for your comment.

Comment #89

I support prescribed burning to reduce hazardous fire risk to our communities and public lands and resources.

Gloria and Bob Ziller

Response #89

Thank you for your comment.

Comment #90

This certainly looks like on the cover, a reasonable way to deal with smoke abatement. Let's explore this approach a little further.

John Altshuler

Response #90

Thank you for your comment.

Comment #91

We urgently need action to reduce the available fuel for these wildfires which are destroying the air quality. Controlled burns during wet season and much more active forest management is critical.

Carolyn Patten

Response #91

Thank you for your comment.

Comment #92

Too many summers here in Klamath Falls being stuck with very unhealthy air. We all need very active, forward thinking measures to reduce forest fires. And that means MORE PRESCRIBED BURNING. This and all new rules, regulations and policies need to strongly encourage and facilitate prescribed burning of forests. I strongly believe people will accept low levels of smoke over their towns if they understand it is to prevent bigger fires = dense smoke for too long in summer. Please avoid tangled bureaucratic issues that divert from the very needed effort: allow very much more prescribed burning, please! ...And force/require commercial logging companies to prescribe burn their lands much more timely.Thirdly, research shows that commercial forest "tree plantations" from clear cutting burn worse than mature, multi-structure, multi-species forests. Addressing this problem should also be done [like limiting size and locations of clear cuts.]

Dave Potter

Response #92

Thank you for your comment.

Comment #93

After decades of ill-conceived fire-suppression, we need more prescribed burns -- and without

the one- hour threshold. We must have more restrictive and enforceable rules on industrial forestlands to limit clearcutting and its resultant slash. We must prohibit the manufacture and use of all herbicides, everywhere. And the use of kraft paper as an alternative to polyethylene plastic for curing burn piles would have many benefits, especially the respiratory health of our firefighters.

Laura M. Ohanian

Response #93

Thank you for your comment. Kraft paper is an approved material for covering piles. Land owners and industry have a discretion on what material to use. ODF completed research, which is included as part of this rulemaking docket, that demonstrates emissions from the combustion of polyethylene covers. The research demonstrates that piles covered with polyethylene material stay dryer through the wet season, burn hotter and cleaner with less smoke, and complete combustion faster than a wet pile. Kraft materials have been researched by the Smoke Management Advisory Committee in the past, and were shown to be not as effective as polyethylene due to its increased tendency to rip and tear.

Comment #94

Please prioritize science-backed solutions that take into account long-term forest and community health such as prescribed burns, responsible thinning projects near populated areas, and protecting old growth from logging. Please reject reactionary calls for post-fire logging. This is a time to work together for Oregon's future, not for opportunistic giveaways to big timber corporations. Thank you.

Michelle Glass

Response #94

Thank you for your comment.

Comment #95

As Applegate Valley residents who live adjacent to BLM lands, we support more management on federal/state lands. However, the private landowner/resident adjacent to said lands has to be informed in advance of all burning activity. We react to smoke and flames in our forests all 12 months of the year; our lands are our future and so caution needs to prevail. So does a 'good neighbor' relationship. We attended the Medford ODF/DEQ meeting and was very disappointed, in that the speakers related to the audience very poorly. All they could/would address were the lines given to them. This does not bode well for good neighbor relations out on the land. We support the proposed changes above IF there are plans in place for informing the public in advance, especially the owners of adjacent federal/state lands to be treated. Please respond back if you do not understand the issue we are addressing. Thank you.

Sandy and Don Shaffer

Response #95

Thank you for your comment. The proposed rules require ODF and DEQ to develop a communication framework for prescribed fires to be used throughout Oregon. This framework will include information that the public can use to protect their health from smoke, the locations of planned burns, and when impacts may occur.

Comment #96

I support winter season prescribed burns only as they do present dangerous or unhealthy air quality. Southern Oregon is particularly susceptible to inversions during the winter months and burning during the low pressure inversions need to be monitored as to not coincide with burns. I would like to see the protocol and testing that will be done before authorizing prescribed burns.

Jared Cruce

Response #96

Thank you for your comment.

Comment #97

I thank you for the opportunity to provide comments to the Oregon Department of Forestry (ODF) and Oregon Department of Environmental Quality (DEQ) concerning the proposed rule changes to Oregon's Smoke Management Plan. This summers' fire season in Oregon and across the West is yet another indication that wildfires are becoming larger, more frequent, more intense, and more complicated.

I appreciate the work by ODF and DEQ staff in leading the smoke management plan review and we applaud the effort to align Oregon's smoke management rules with the federal Clean Air Act 24-hour National Ambient Air Quality Standards (NAAQs). I have been monitoring the conversations about updates to the smoke management plan, and from that I believe that using the NAAQS (including the proposed buffer of 75% of the NAAQS) to define smoke intrusions strikes an appropriate balance by addressing our shared interest in protecting public health, minimizing smoke entering communities, and allowing critical prescribed burning to occur as we work together to confront the very real wildfire threat facing our communities.

Based on my reading and discussions, I have significant concerns with the 1-hour threshold, which runs counter to our broader societal interest in a smoke management policy that account for the short and long- term consequences of wildfire. Data shows that the 1-hour threshold would impose a significant limitation on the very prescribed burning priority areas that are most critical to community wildfire protection efforts.

Consequently, my support for smoke management rule package is contingent upon the inclusion of the provision providing communities a clear, simple, and attainable process to obtain an exemption from the 1-hour smoke threshold when they have implemented a smoke communication and mitigation plan.

Thank you for the opportunity to provide comment on the proposed rules. The fire-prone forests of Oregon will burn sooner or later. Our choice is when and how they will burn: in a controlled way during carefully planned and implemented prescribed fire or during out-of-control wildfires. In light of the science on this topic, I believe that the short-term impacts of prescribed fire will be far less than the impacts of wildfire in the long-run and I urge you to adopt the proposed rules so we can do what is needed to protect our forest ecosystems, communities, and firefighters now and in the future.

Meg Krawchuk

Response #97

Thank you for your comment.

Comment #98

In order to lessen the impact of increasingly common and hot wildfires, all managing agencies and landowners need to implement rational, sustainable forest management practices. Controlled burns during the wet season, selective thinning of younger trees, and diversification of species planted will all help make our forests safer and healthier.

Scott Hoelscher

Response #98

Thank you for your comment.

Comment #99

I support burning during the wet season to help alleviate wildfires and their smoke during the fires season.

Mike Prinslow

Response #99

Thank you for your comment.

Comment #100

I strongly support increased efforts to use prescribed fire under moist conditions, establish fuel breaks around vulnerable communities, thin excessive fuel loads back to normal levels, and prevent post-fire commercial logging. We need to stop mindless fire suppression and restore more natural fire return intervals and fuel loads. Fire should be respected as a normal and ecologically necessary disturbance process. Past fire suppression has created the excessive fuel loads that now pose serious problems.

Through careful planning of fuel thinnings and prescribed fire, we should eventually be able to get back to where we belong in terms of fire ecology. Thank you for considering my comments.

Richard Spotts

Response #100

Thank you for your comment.

Comment #101

I am writing to express my broad support in the proposed rule changes to OAR 629. I strongly support the changes because it gives the reader a greater understanding of the benefit of prescribed burning. A practice which I hope to see utilized as a tool to reduce unmarketable forest fuel from the Oregon landscape. The use of polyethylene sheeting in slash burning, as some environmentalists have opposed, is also broadly supported by me (and I identify as an environmentalist). The reasons I support the use of polyethylene sheeting to keep slash piles dry for prescribed burning is that: 1. it is much safer to ignite these piles when all other fuels are damp from rain or snow, and the need to keep them dry until that time with polyethylene sheeting is a necessary move. 2. An uncontrolled fire sparked by lightning or otherwise ignited can easily burn cars, farming equipment, homes or other buildings which all contain far

worse chemicals and in vastly greater quantities. My only concern would be for those employed in the close monitor of such slash burning and that adequate respiratory protections are in place to protect those workers. The changes to the rule regarding smoke intrusions and incidents are all steps in the right direction. I am in favor of the documenting requirements so that the plan can be reviewed after implementation and affected communities can review such records and better coordinate public awareness systems for those living near any prescribed burn that may be categorized as a SSRA. Thank you for your time.

Jamie Morrison

Response #101

Thank you for your comment.

Comment #102

We appreciate the Oregon Dept. of Forestry and Environmental Quality stepping in the right direction to get more fire on the lands around our homes and communities, but we are concerned that the proposed 1- hour period of measurement will limit opportunities to burn.

Jim Yarbrough

Response #102

Thank you for your comment.

Comment #103

The invention of the helitorch seems to coincide with ridiculously giant wildfires that smoke out every other economy except the wildfire ignition economy. Here is a video about the helitorch.

Alden Moffatt

Response #103

Thank you for your comment.

Comment #104

We need to put people to work in Oregon. Projects to thin forest to reduce risks of wild fires is essential on many levels. I just returned from the coast and took the 7 Devils hwy. out of Bandon. I was horrified at the amount of clear cutting that had left huge portions of the environment ravaged next to forests so densely packed that no human could pass through. New growth areas were densely packed and looked more like carpet than trees. The State could create healthy and sustainable jobs to address Climate Change.

Patricia Browning

Response #104

Thank you for your comment.

Comment #105

Where is forest management, arborists told me that years ago in this area there was very good management which today is no longer done.

Nina Council

Response #105

Thank you for your comment.

Comment #106

I support the idea of controlled burns in the wet season as a way to decrease the seriousness of the summer fires, which are of particular concern to those of us who have pulmonary conditions.

Sarah Breckenridge

Response #106

Thank you for your comment.

Comment #107

I support the amendments to the smoke management rules that will allow more prescribed burning. Our forests need help!

Sarah Mowry

Response #107

Thank you for your comment.

Comment #108

As a resident of Southern Oregon and an avid hiker, I have long been a proponent of prescribed burns, especially when such burning has been affiliated with the removal of mid-sized trees while leaving standing the larger and older trees. I have hiked on trails as soon as they have been re-opened after a period of thinning and controlled burns, while some of the fires are still smoldering. Such smoke is limited, doesn't seem to spread or cause the dense level of particulates that we citizens have experienced when smoke from wildfires roll into our city. Despite controlled burns in our nearby forest being visible from downtown, I've never seen citizens wearing masks to protect their lungs from this distant smoke--quite the contrast to the preponderance of masks worn during wildfire "season." I have appreciated being able to know when and where control burns are occurring because Ashland posts such news in the local newspaper (as well as signs at trailheads). I'm confused by hourly restrictions being placed on prescribed burning. With our longer and hotter and drier summer/fire season (and at times long dry spells during our winter season), we need less restriction and more encouragement for control burns. While hiking, I've viewed many slash piles waiting their turn to be ignited and wondered why layers of plastic were being used in the drying process, as burned plastic would release toxins into the air. I support such plastic being replaced by less toxin-producing materials. I strongly support managing our forests during our moist seasons as one means for decreasing the number and severity of wildfires experienced during our dry and hot seasons.

Bob Morse

Response #108

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implementation mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

DEQ also encourages the commenter to review the research paper provided in the EQC briefing for this proposed rulemaking on the emissions from the combustion of polyethylene during prescribed fire pile burns.

Comment #109

As concerned citizen who lives in the Ashland/Medford air basin, I strongly support loosing the air quality regulations on prescribed burning. While I've been aware of the need and the science for many decades, we are now in crisis and more intentional wet season burning is the only viable way forward. ve temperature inversions that trap smoke in the valley. I'd probably recommend even more liberalization than what's anticipated. Tolerating a little smoke in the wet season is much preferred to the air muck we've lived in the past two summers. Please go for it!

Mark Hamlin

Response #109

Thank you for your comment.

Comment #110

I agree that we need more prescribed fire on private and public lands. We must do much more controlled burning in the wet season when we don’t have temperature inversions that trap smoke in the valley.

Burning during these conditions will allow smoke to rise straight to the upper atmosphere, away from communities and our lungs.

Ellen Watrous, Barbara Watrous

Response #110

Thank you for your comment.

Comment #111

I support the development of a community plan that explains the importance of prescribed

burning to mitigate wildfire and wildfire smoke. This includes ample notification to the public of when prescribed burning is likely to occur, notification to vulnerable residents of the likelihood that there may be smoke from prescribed burning, and help implementing actions residents can take to reduce exposure. I am concerned that the proposed 1-hour threshold limits the amount of prescribed burning conducted. This will impose unnecessary restrictions on critical prescribed burning priority areas that are most vital to reducing smoke effects from wildfires here in Southwest Oregon. I support a clear, simple, and attainable process to obtain an exemption from the 1-hour smoke threshold when communities have implemented a smoke communication and mitigation plan. Many of the fire prone forests of southern Oregon are arranged in a checkerboard ownership pattern with industrial land interwoven with Southern Oregon BLM Lands. Industrial timber plantations have been proven by science to burn faster, hotter, leading to more smoke production than natural forests. In addition to increasing prescribed fire and slash disposal, ODF should consider rules to ensure that private industrial forest practices do not increase future fire hazards and smoke production by limiting clearcutting and the production of activity slash. Also, aerial herbicides application and the practice of "hack and squirt" can cause widespread hardwood die-off, leaving senescent, dry vegetation on site and increase fire hazards on the landscape. Prescribed burning must be used in concert with strategic thinning to minimize fuel loads on public and private land. With decades of fire suppression and the creation of tree plantations, we need to restore our degraded forests. We need more restoration thinning, not more old growth logging.

Oscar Contreras

Response #111

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implementation mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

Comment #112

We must do much more controlled burning in the wet season when we don't have temperature inversions that trap smoke in the valley. Burning during these conditions will allow smoke to rise straight to the upper atmosphere, away from communities and our lungs. Utilize prescribe fire to allow for fuel reductions in the forest understory. ● Focusing fuels reduction and thinning projects near homes and communities. ● Protecting big fire resilient trees from logging. ● Create or maintain fuel breaks along roads and key ridges important for fire management. ● Refrain from post fire logging and allow forests to naturally heal after wildfire. ● Avoid replanting dense single-species tree farms that may increase fire hazard. ● Retain undisturbed backcountry wildlands. ● Reduce the legacy sediment impacts of logging road networks.

Andrew Schwarz

Response #112

Thank you for your comment.

Comment #113

My home is in the Rogue Valley, specifically Medford. I have personally experienced summers of smoke, so I have an investment in your forest management decisions. I've read a letter sent to you from KS Wild and agree that the one hour limit on controlled burning during the off season is not long enough. We have many acres of land that need attention immediately. There are many other points in their letter that I agree with also. I agree with all they say. Thank you

Donna Rutledge

Response #113

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implementation mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

Comment #114

Humans have made fires worse. With decades of fire suppression and the creation of tree plantations, we need to restore our degraded forests. We are experiencing record breaking temperatures and drought. We need more science based restoration, which includes more prescribed fires during wetter seasons. ● Because wildfires typically burn during hotter, drier conditions than when prescribed fires burn, more vegetation is consumed by fire producing more emissions. Also, summer fires often occur during periods of atmospheric stability and thus air stagnation, trapping smoke close to the ground where it’s more likely to impact humans and less likely to be quickly carried away by higher altitude transport winds. ● Prescribed burning must be used in concert with strategic thinning to minimize fuel loads on public and private land. With decades of fire suppression and the creation of tree plantations, we need to restore our degraded forests. We need more restoration thinning, not more old growth logging. ● Fires are a natural part of typical dry Oregon summers. We won’t be able to stop all fires, but prescribed fire can help our communities build a better relationship with fire. ● We support the development of a community plan that explains the importance of prescribed burning to mitigate wildfire and wildfire smoke. This includes ample notification to the public of when prescribed burning is likely to occur, notification to vulnerable residents of the likelihood that there may be smoke from prescribed burning, and help implementing actions residents can take to reduce exposure. ● Many forests need restoration. By thinning small trees, clearing brush, and intentionally setting controlled fires during wetter months when smoke won’t get trapped in valleys, we can reduce the threat of more severe fires in our increasingly hot, dry summers. This won't stop all wildfires, but it will create safer conditions for firefighters.

Jasmine Patten

Response #114

Thank you for your comment.

Comment #115

Many forests need restoration. By thinning small trees, clearing brush, and intentionally setting

Susan Delles

Response #115

Thank you for your comment.

Comment #116

I hope DEQ will loosen the rules AS MUCH AS POSSIBLE in southern Oregon to allow prescribed burning during the spring and fall. the amount of smoke generated by prescribed burning is vastly preferable to what we experienced this summer. Because we will keep having this smoke-filled summers if we don't get a handle on the fuel. I know there are people who are much more sensitive to smoke than myself but living in southern Oregon means there will be smoke so we can lessen the impact if DEQ will allow more burning. And its not just smoke -- there are significant impacts to the forest as well with larger hotter fires, especially where they are reburning the same areas over and over.

Katy Mallams

Response #116

Thank you for your comment.

Comment #117

With decades of fire suppression and the creation of tree plantations, we need to restore our degraded forests. We are experiencing record breaking temperatures and drought. We need more science based restoration, which includes more prescribed fires during wetter seasons. We need more restoration thinning, not more old growth logging.

H Berg

Response #117

Thank you for your comment.

Comment #118

I support allowing more prescribed burning in the wet season and relaxing the emissions regulations to allow for more burning days and closer proximity to population centers.

Bryan Della Santina

Response #118

Thank you for your comment.

Comment #119

As a resident of the Rogue Valley, I support the revised Smoke Management Plan. Fire management on public and private forest lands should be based on data driven science. Prescribed fire in the wetter months is an important part of the solution to excessive summer smoke.

James Ferguson

Response #119

Thank you for your comment.

Comment #120

Southern Oregon Land Conservancy is a 40-year old regional land trust, a local nonprofit organization, with over 10,300 acres of conserved land in Southern Oregon, including Jackson County. We own and manage land and also hold conservation easements on private and city properties. Our conserved lands include city natural areas, like Siskiyou Mountain Park and the Jacksonville Woodlands, working forests, oak woodlands, farms, and ranches. Many of our lands are in fire-adapted ecosystems where we and partners commonly implement ecological thinning and fuels reduction activities. A few of our conserved lands have been treated with prescribed fire to further reduce fine fuels, fuels hazard and to restore biodiversity. We would like to see more prescribed fire on our lands and adjacent lands to enhance conservation values and to reduce hazards, but there are many barriers such as costs and a narrow window of time for intentional burning.

We appreciate the work by State of Oregon staff in leading the smoke management plan review and we appreciate the effort to align smoke management rules with the federal Clean Air Act. For economic resilience, public health and safety, and a vital natural world, we support The Oregon Department of Forestry and Department of Environmental Quality's proposed exemption to the 1-hour smoke threshold in local communities. We are also strong supporters of just following the 24-hour air quality EPA guidelines and discarding the 1-hour smoke threshold. Our support for the smoke management rule package is contingent upon the inclusion of the provision providing communities a clear and attainable process to obtain an exemption from the 1-hour smoke threshold when they have implemented a smoke communication and mitigation plan.

Thank you for the opportunity to comment on this critical issue.

Kristi Mergenthaler, Southern Oregon Land Conservancy

Response #120

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implementation mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

Comment #121

I want to thank the ODEQ and ODF for working to help mitigate the impacts of large wildfires on the communities and citizens of Oregon.

I have several questions and concerns regarding the proposed changes.

First, I am deeply concerned by the committee's recommendation to revise the definition of smoke intrusion to "include a one-hour threshold at or above 70 ug/m3 and a 24 hour average at or above 26 micrograms per cubic meter, measured midnight to midnight on the first day of smoke entrance into a community." Also, there is no regulation regarding the number of allowed smoke intrusion days. These changes in the rules potentially allow for hazardous air quality for longer than 24 hours and for any number of days. According to the World Health Organizations Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen, Carbon Dioxide and Sulfur Dioxide, "more than 2 million premature deaths each year can be attributed to the effects of outdoor air pollution and indoor air pollution (caused by the burning of solid fuels)". The people of Southern Oregon experienced weeks and weeks of unhealthy to hazardous air, many days it was the worst air quality on the planet. It would be egregious if the ODEQ and ODF allowed for an increase in hazardous emissions during seasons when we count on fresh, clean air, even in a perceived short term. The risk to public health is too great.

Second, the committee's proposal to "encourage communities to develop a response plan to notify their citizens of potential smoke impacts and how they can reduce their exposure" is problematic for several reasons. If communities do not develop plans to notify citizens in a timely matter, people's health will be at risk. People will be at risk if they cannot follow proposed plans, for example those who work outside or children walking to school.

Has the DEQ or ODF completed studies on the effectiveness of the 1972 regulatory program that is being used to guide these decisions?

Have studies been completed to assess the economic impact on communities due to increased prescribed burns and unhealthy air quality?

Have studies been completed on the health impacts on communities due to increased exposure to unhealthy and hazardous air quality?

Have studies been completed to assure that increased prescribed burning effectively reduces the potential of large wildfires in the state of Oregon?

Clean air is considered to be a basic requirement of human health and well-being. After this summer, it would arguably be criminal to subject people, especially people in Southern Oregon, to any additional smoke without the certainty that it will reduce the long-term impacts of large wildfires.

Thank you for seriously considering the concerns of the people whom will be directly impacted by your decisions,

Emily Coleman

Response #121

Thank you for your comment. The performance of the Smoke Management program is reviewed annually by the Smoke Management Review Committee. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. Stakeholders who participate in the Smoke Management Review Committee are appointed by the Board of Forestry and represent the many interests involved in establishing the policy balance directed by the legislature. The proposed rulemaking is an effort to balance these two policy outcomes. With the increased potential for smoke entering communities comes the increased need for proactive communications about prescribed fires and their potential impacts. The proposed rules require ODF and DEQ to develop a communication framework for prescribed fires to be used throughout Oregon. This framework will include information that the public can use to protect their health from smoke.

One of DEQ's roles is to monitor the air quality throughout Oregon for compliance with the National Ambient Air Quality Standards. ODF uses DEQ monitoring data when determine if a burn should be approved for any given day. Our network of monitors measures emissions from prescribed fire, along with all other sources of emissions (wood stoves, backyard burning, automobiles, etc.). These monitors ensure that DEQ and ODF have accurate information to make decisions before a burn is approved. DEQ closely coordinates with ODF on implementation of the Smoke Management Program to ensure that communities who are approaching the NAAQS are more carefully managed to prevent a violation of the standard.

Comment # 122

As lifetime resident of the Rogue Valley who suffered through the worst summer of smoke, I oppose increasing the allowable levels of unhealthy and hazardous air quality levels of prescribed burning. Scientific studies of prescribed burns reveal the gaps in our understanding of the effectiveness of this practice for fuel reduction in Oregon forests. I think it is critical to understand the real impacts of these policy changes especially since they have such a serious and direct impact on the health of the people who are affected by these policies. ATTACHED publication "A review of prescribed burning effectiveness in fire hazard reduction'. International Journal of Wildland Fire, 2003.

Debra Blair

Response #122

Thank you for your comment. The performance of the Smoke Management program is reviewed annually by the Smoke Management Review Committee. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. Stakeholders who participate in the Smoke Management Review Committee are appointed by the Board of Forestry and represent the many interests involved in establishing the policy balance directed by the legislature. The proposed rulemaking is an effort to balance these two policy outcomes.

Comment #123

We submit these comments on behalf of the Oregon Forest & Industries Council and its member companies, Associated Oregon Loggers and the Oregon Small Woodlands Association. Collectively representing over 5 million acres of private forest land in Oregon and responsible for over 50% of accomplished acres of prescribed burning through the Oregon Smoke Management Plan yearly. It is important to us to convey that we very much support most of the proposed changes to the Smoke Management rule. We believe in the importance of prescribed burnings role in mitigating wildfire risk and improving forest health. We also believe that most of the changes in the rule provide for an adaptive, responsive, and iterative framework for accomplishing the goals of the Smoke Management Plan for Oregon. With all of that in mind we feel that there are specific places within the proposed rule that still need adjustment to ensure near and long term success for prescribed burners and the public of Oregon.

Following are our collective comments listed by OAR section.

- 629-048-005 (27) Smoke Intrusion definition
    - We very much support the change in the definition of an intrusion as a positive step towards defining metrics that are measurable, predictable and still provide for protection of air quality objectives within SSRAs. How these changes are implemented by the Forecasters and local Districts will be key to creating

additional burn opportunities.

- The 24 hour standard is an important balance between accomplishment and protection of air quality. As it has been explained the standard of 26 microgram/cubic meter is 75% of the NAAQS standard. This seems appropriate and is in alignment with what other states have done (per EPA comment) and EPA has approved the criteria for those states.
- 1 hour standard remains as a concern. It will be a major obstacle for essential burning within the WUI directly adjacent to communities. Consequently, the major challenge of burning on the highest priority lands for some East Side communities will not be addressed by the current review and rule proposal. This may also be an obstacle on the West Side where burning needs to occur within or directly adjacent to SSRAs. We strongly encourage that a robust and reasonable process be developed that will allow for essential burning within the WUI.

- 629-048-0010
  - We continue to advocate that an addition clearly specifying the link between prescribed fire and reduction in frequency and intensity of wildfires is needed. Suggest adding: "477.005 Declares that the public policy of the State of Oregon is to preserve forests through the prevention and suppression of forest fires. Prescribed burning is one very important tool used to reduce forest fuels, re-introduce fire on the landscape, and has been demonstrated to reduce the potential for a fire to start. It has also been demonstrated to show that fire suppression actions are more effective and lower in cost in areas with a recent history of burning."
- 629-048-010(4) (a)
  - Changing the word "prevent" to "minimize" is consistent with the current review and with ORS 477. However "minimize" could still be interpreted as a goal of prevention or keep us at a zero tolerance.
  - Suggest changing this to be "minimize smoke intrusions" which more effectively carries the intent of the review outcomes.
  - We continue to advocate for the importance of the "purpose" of modern prescribed burning to reduce future wildfire impact. This was a topic much discussed by the Smoke Advisory Committee and in line with the purpose and goals of the Smoke Management program. Potential language could read: Foster the implementation of prescribed burning projects as a hazardous fuel reduction technique, which contributes to the long term and landscape-scale reduction of future unwanted wildfire smoke pollution and wildfire smoke's public health impacts.
- 629-048-0010(4)(c)
  - Protecting public health by avoiding intrusions is not specified anywhere in Statute. We agree that protecting public health is important. We also understand that there are significant differences in health consequences based on smoke duration and intensity. The word Avoid means do all you can to prevent. Minimize means that while efforts are taken to keep smoke out of SSRAs there is recognition that sometimes and intrusion may occur. We can accept this addition if the word "avoiding" is replaced with "minimize".
  - ORS 477.552 Policy. It is the policy of the State of Oregon:
    - To improve the management of prescribed burning as a forest

management and protection practice; and

- To minimize emissions from prescribed burning consistent with the air quality objectives of the federal Clean Air Act and the State of Oregon Clean Air Act Implementation Plan developed by the Department of Environmental Quality under ORS 468A.035. [1989 c.920 §2]

- 629-048-0020(5)
  - Replace the first sentence with: Prescribed burning is an important forest management technique in all of Oregon's forests to reduce forest fuels for the purposes of both short and long term fire prevention and to aid in fire suppression. Prescribed fire has been demonstrated to reduce wildfire starts, to significantly reduce wild fire emissions and to readily assist in wildfire suppression.
- 629-048-0021
  - Strongly encourage additional wording to recognize that while all sources of smoke may be harmful, there is a distinct advantage and benefit to public health to allowing prescribed fire smoke that is managed and controlled to limit magnitude and duration as compared to uncontrolled wildfire smoke.
- 629-048-110 (2)
  - Source of measurements needs to be defined i.e. What type of equipment is acceptable for determining compliance? Who owns the equipment? How is data quality controlled and determined.
  - DEQ has stated they will deploy 30 new pieces of PM monitoring equipment. Should specify how these will be utilized to determine compliance.
  - Use of Purple Air monitors and others is increasing – control of the equipment and data is beyond the scope of air quality agencies and may not provide accurate data to determine compliance.
  - The phrase "...based on particulate matter values (averaged over a one-hour period)…" is different than the definition of an intrusion which states "..70 micrograms per cubic meter for any one- hour period and/or averages at or above 26…" we suggest staying with the definition language.
- 629-048-110(3)
  - Visibility tables in the Directive will need to be modified to define reductions as quantified particulate matter values instead of light, moderate & heavy.
  - New methodology will need to be developed to accurately portray air quality over the 24 hour period. This will be very difficult as often visibility is not documented in the hours preceding the smoke intrusion or incident. It is also near impossible to use visibility standards for events that occur at night (in the dark).
- 629-048-110(4) and (5)
  - (4) states that the Directive "..will describe applicable reporting requirements and actions to be taken."
  - (5) states that the Directive "will describe applicable reporting requirements and adaptive management actions to be taken.."
    - Defining what "actions to be taken" in rule is preferred vs staff defining in guidance without some form of public review and comment.
    - We strongly support that "Actions to be taken" are defined in rule.

- 629-048-120(1)
    - States the objective is to "avoid smoke intrusions". As an objective this can be construed to mean "take no risks" and would thus reduce burn opportunities.
        - "avoid" should be replaced with "minimize" to recognize that intrusions will occur from time to time if forecasters are being diligent in attempting to maximize burn opportunities. The concept of maximize opportunity and avoid intrusions are at odds with each other. The only way to truly maximize opportunity is to make an effort to minimize intrusions but not take all actions required to "avoid" intrusions.
- 629-048-0135, 137
    - Moving these two items from the Directive into the rule does not make sense. ▪
    - SPZs are already protected as SSRAs
    - Language utilized has not been updated to reflect current understanding of smoke tradeoffs.
    - Language is not consistent with new direction and intent of these proposed rules
    - Recommend strongly that both sections remain within the Directive and be updated to better align with the intent of the new rules in order to recognize the tradeoffs of prescribed fire smoke vs. wildfire smoke for the betterment of the State's overall air quality.
- 629-048-150 Criteria for Future Listing of SSRA
    - Previous criteria was based on the premise that any smoke into an SSRA was an Intrusion and any smoke into any other community was an Incident.
    - Proposed language defines Intrusion as a level of particulate matter above a threshold in SSRAs. Incidents are defined as any particulate below the threshold in SSRAs or at any level in "other communities.
    - Because the metric has moved away from any level to a defined level for SSRAs the Criteria language must be corrected to recognize the change.
        - Recommend that "at Smoke Intrusion thresholds" be inserted in each place that smoke incident occurs in this section.
- 629-048-180 (1), (2)
    - We assert that more work is needed in this section in order to develop programs that achieve the desired outcomes.
        - Putting this workload onto local districts will result in a patchwork of methods that may or may not work as desired. Headquarters led efforts are needed to achieve consistency across the region.
        - Larger SSRAs actually reside outside the District Boundaries and are outside their "jurisdiction" AND large SSRAs have multiple Districts that are "adjacent".
        - Many SSRAs have the potential for smoke incidents from burns originating in other Districts. For example: WL burn impacts Roseburg in DFPA area o Sometimes adjacent Districts do not know that the others are burning
- In order to address potential for Smoke impacts across jurisdictional boundaries we offer:
    - Smoke can "jump" over a District and into the next. For example a burn in

CFPA can go over WL but land in S Cascade.

- ODF, DEQ and OHA should jointly develop a framework to be implemented in all SSRAs
  - Achieves consistency in methods, approaches and outcomes
  - Common Framework will provide for uniform implementation
  - When Forecaster knows that a burn is PLANNED that is expected to add smoke into the SSRA a message could be sent out to that community.
  - Information would only be sent out for those planned burns where the Forecaster reasonably believes that smoke will enter the SSRA.
    - Reduces false alarms
    - Only brings visibility to burns that are expected to cause an impact
  - Secondary notice could be triggered by the local District if it appears that smoke will reach the intrusion criteria.
- This does not preclude a community from having an enhanced program based on the unique makeup of the area and frequency of events.
- System could double as a wildfire smoke alert system.
- Not successfully addressing this issue will ultimately result in public outcry over minor amounts of smoke.

- 629-048-0180(3)
  - Encourage well defined process developed by stakeholders prior to rule approval
    - Strongly recommend that Stakeholders from the Review Committee gather after the hearings and prior to final rule development to define a "permitting" process that meets the needs of communities, accomplishes necessary fuel reduction work and protects public health.
- 629-048-0210
  - We strongly support the Cover rule change and advocate for its continued inclusion as written.
  - Encourage the development of incentives for burners to employ emission reduction techniques such as covering piles.
    - We understand from pile burning research that covered piles produce fewer emissions than uncovered piles. One possible incentive would be that more burning can occur on a given day if piles are covered.
- 629-048-230(1)(d)
  - Says to "minimize smoke" which infers that a goal is as little smoke as possible
    - Could be interpreted to mean no smoke which essentially nullifies the gains made by the change in the definition of the intrusion.
    - Fix by wording as "minimize smoke intrusions"

Overall we believe that the priorities of expanded prescribed burning are well balanced and promote the absolute necessity to protect public health. This is a "win-win" for the public and land managers. We recognize that this proposal is a radical shift from past smoke regulations and as such will need to be carefully implemented in order to maintain and increase public support and acceptance of prescribed fire smoke. Further refinement of language to ensure consistency with ORS and within the

proposed OAR has our support.

We genuinely appreciate the opportunity to provide these comments. And would like to reiterate the importance of the new proposed rule language as well as the suggestions provided herein.

Jim James, Oregon Small Woodland Association, Kristina McNitt, Oregon Forest & Industries Council, President, Rex Storm, Associated Oregon Loggers, Inc.

Response #123

Changes were made to OAR 629-048-0010 in response to your comment. The Smoke Management program has been effective in implementing prescribed fire while preventing smoke from entering Smoke Sensitive Receptor Areas, as evident in the number of intrusions that have occurred. While DEQ acknowledges the need for the increased pace and scale of prescribed fire as a forest management practice, DEQ also acknowledges the historical success of the program. The legislative directive for the program is to balance the use of prescribed fire while protecting public health impacts from prescribed fire smoke in alignment with the Clean Air Act. DEQ disagrees with the commenter regarding the use of the term avoid and finds the term appropriate when balancing the two policy outcomes defined by the legislature. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Intrusions are an unacceptable outcome of a burn and should be avoided. The use of the term minimize would risk the exceedance of the National Ambient Air Quality Standards and would undermine the purpose of the smoke management program.

Changes were made to OAR 629-048-0020(5) in response to your comment.

Regarding comments made on proposed revisions to OAR 629-048-110 (2), DEQ disagrees with the recommendation and finds the language in the proposed rules aligns with overriding program authority.

Regarding comments made on OAR 629-048-110 (2), DEQ agrees that quality data must be used for program implementation. Use of DEQ monitors is not established in rule, but protocols for quality assurance are established in DEQ regulation. Monitoring data must meet specific criteria in order for it to be considered for National Ambient Air Quality Standards compliance demonstrations. Also, DEQ agrees that the definition of a 1-hour average intrusion should align with the description in the rule. Changes were made to the rule language in response to your comment.

Changes were made to OAR 629-048-110(3) in response to your comment. DEQ understands the challenges for the visible observation method of determining intrusions resulting from the proposed rule changes. DEQ is establishing air quality monitors in all Smoke Sensitive Receptor Areas to ensure that measurement of ambient concentrations of particular matter is available for determining intrusions. DEQ anticipates the visible observation method being used in specific circumstances and under rare conditions and therefore will have negligible impact on the successful implementation of the proposed rules. Nevertheless, DEQ will work with ODF and the Smoke Management Review Committee to study the existing best practices for visible emission estimations to determine if additional detail should be included in the rule or directive in the next review cycle.

Regarding comments made on OAR 629-048-110(4) and (5). ODF Directive language is made available to the public for comment during DEQ's public comment period.

Regarding comments made on OAR 629-048-120(1), see DEQ's response to commenter's comment on OAR 629-0020.

Changes were made to OAR 629-048-0135, 137 in response to your comments. The Smoke Protection Zones were updated to reflect current proposed rule changes.

Changes were made to OAR 629-048-150 in response to your comments. The overall changes to the definitions of Smoke Intrusion and Smoke Incident were incorporated into this section.

Changes were made to OAR 629-048-180 (1), (2) in response to your comments. Additional information was added to the proposed rules allowing for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implementation mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA. The communications framework developed jointly by ODF and DEQ may be used by communities in the development of their community programs.

Regarding comments made on OAR 629-048-0180(3), DEQ acknowledges the need for communities to develop plans and programs that meet the specific needs of their members. The proposed rule language for community programs establishes the contents that must be included in a program in order for ODF and DEQ to complete a review while also allowing the community flexibility to establish a program that meets their community needs. DEQ encourages stakeholder coordination.

Regarding comments made on OAR 629-048-230(1)(d), DEQ finds the language to align with overriding authority of the Smoke Management Program and no changes were made.

Thank you for the review and comments.

Comment #124

On behalf of the City of Prineville City Council, we thank you for the opportunity to provide comments to the Oregon Department of Forestry (ODF) and Oregon Department of Environmental Quality (DEQ) regarding the proposed rule changes to Oregon's Smoke Management Plan. The fire season this year in Oregon is another reminder that more work is needed to reduce potential intense fires and to reduce wildfire risks near communities which includes strategic prescribed fire in the forests surrounding our community.

We support ODF's and DEQ's efforts to align the Oregon's smoke management rules with the federal Clean Air Act 24-hour National Ambient Air Quality Standards (NAAQs). We support a healthy balance between protecting public health and allowing critical prescribed burning to occur as we work collaboratively to address the wildfire threat and smoke intrusion caused by wildfires negatively impacting our communities.

Should the one hour threshold be included in the final version of the rules, our support for the rule package as a whole is contingent on inclusion of the proposed exemption process for those communities with a proactive communication and mitigation strategy. The exemption process is absolutely essential to the proposed rules if the one hour standard remains in the final version of the rules. Without the one hour exemption our community, infrastructure, natural resources, and firefighters will remain at risk with the increasing severity of wildfires.

We encourage acting now to change the Smoke Management Plan and move forward with theses proposed changes. The fire-prone dry forests of central Oregon will burn sooner or later. Our choice is when and how they will burn in a controlled way during strategically planned and executed prescribed fire rather than out of control wildfires.

Betty Roppe, Mayor

City of Prineville

Response #124

Thank you for your comment.

Comment #125

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
AIR AND WASTE

Mr. Peter Brewer
Oregon Department of Environmental Quality
475 NE Bellevue Drive, Suite 110
Bend, Oregon 97701

Dear Mr. Brewer:

The Environmental Protection Agency appreciates the opportunity to comment on the proposed rulemaking, "Amendments to Oregon Smoke Management Plan and the Oregon State implementation Plan for Air Quality." Please accept the following comments for your consideration.

- OAR 629-048-0005(27) and (28): We recommend adding language that clearly identifies which pollutant (we assume PM2.5) will be measured to determine the 70 micrograms per cubic meter one-hour threshold and 26 micrograms per cubic meter 24-hour threshold levels to qualify as a "Smoke Intrusion." The SIP submittal should include the analysis Oregon used to determine the basis for these thresholds and how they relate to ensuring protection of the NAAQS for that pollutant, in particular, the annual NAAQS.

- OAR 629-048-0110(3): We recommend Oregon add a citation for the "standard National Weather Service visibility observation criteria" or add more detailed description of the methodology to Directive 1-4-1-601.

- OAR 629-048-0135(l)(b): We recommend adding criteria that will be used to determine if monitoring is unnecessary

- OAR 629-048-0137: We recommend adding a description of how it will be determined if prescribed burning is a "significant contributor," as well as who is responsible for that determination.

- OAR 629-048-0180(c): This provision should be revised to ensure that granting the exemption under this provision will not result in a NAAQS violation.

- To facilitate the submission and EPA review of exceptional event demonstrations for elevated values attributable to prescribed burning, where appropriate, we encourage ODEQ's SIP submission to identify how Oregon's Smoke Management Plan, as revised, addresses the six recommended components for SMPs described in the preamble of the 2016 Exceptional Event Rule (see 40 C.F.R. § 50.14 and 51.930).

Please note that EPA's final action on any revision to Oregon's revised Smoke Management Plan will be based on EPA's review of the complete submission following Oregon's public process and formal adoption of the plan, the laws in effect at the time of EPA action, and consideration of any comments we receive as part of the EPA public process.

Thank you for the opportunity to review the proposed rulemaking. If you have any questions or would like to discuss these comments, please contact Randall Ruddick at (206) 553-1999 or ruddick.randall@epa.gov.

Gina Bonifacino, US Environmental Protection Agency

Response #125

Thank you for your comment. Revisions were made to the proposed rule based on your comments as follows:

- OAR 629-048-0005(27) and (28): Added a definition for PM2.5
- OAR 629-048-0110(3): this citation is found in the Directive
- OAR 629-048-0135(1)(b): this has been added
- OAR 629-048-0137: this has been added
- OAR 629-048-0180(c): "exceeding the 24-hr threshold" has been added Thank you for your comments.

Comment # 126

At the Bend meeting in August, the facts about smoke effects on health are why I oppose changing the allowable smoke from slash burning. I understand that thinning the forests is important, but there are other ways to deal with the material: chop it up, sell or let people have the wood for wood fire. There are too many days that people are stuck in their homes or outside in the smoke from wild fires endangering their health to add to those days and make the air pollution worse from slash burns does not make sense.

Lynda Hathorn

Response #126

Thank you for your comment. The existing Smoke Management program seeks to implement alternatives to prescribed fire, but is otherwise outside of the scope of this rulemaking. DEQ will continue to investigate and seek the implementation of alternatives to burning, such as biomass utilization for the development of products. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes.

Comment # 127

To: Oregon DEQ and ODF
Attn: Rachel Sakata
700 NE Multnomah St., Suite 600
Portland, OR 97232
Date: 8/21/2018

Re: Amendments to Oregon Smoke Management Plan and the Oregon State Implementation Plan for Air Quality OAR 340-200-0040

The organizations listed below are advocates for a healthy environment on behalf of communities throughout Oregon. We submit these comments to the public record expressing our concern with many of the amendments proposed to Smoke Management Rules under OAR 629-048and Operational Guidance for the Oregon Smoke Management Program, directive 1-4-1-601, which define and amend the State Implementation Plan as part of OAR 340-200-0040.

We object to these aspects of the proposed rule changes:

1. Increasing levels of smoke pollution allowed to enter the airshed of rural and urban communities through increased burning of slash and plastic, which does not hold the same potential to reduce later uncontrolled wildfire emissions as prescribed burning. Failure to distinguish the need for prescribed burning as an ecological and fire prevention tool in the forest landscape versus increasing the amount of smoke allowed from slash burning on clearcuts within corporate timber plantations;
2. Failure to set air quality standards that protect children and other vulnerable Oregonians;
3. Failure to justify the need to increase human exposure to fine particulate matter from slash burning to remove logging waste on private industrial timber holdings;
4. Not setting a limit on the amount of black plastic on timber plantation slash piles that will be burned along with the slash debris;
5. Requiring Community Response Plans without an economic support plan, potentially resulting in hardship and economic inequities onto rural and lower income communities;
6. Failure to align the air quality decisions within the Smoke Management Plan with the DEQ and OHA's goals and rules for Cleaner Air Oregon.
7. Lack of requirements to protect aquatic environments by maintaining water quality and quantity.

Wild fires are undoubtedly a serious problem in Oregon. To be clear, the undersigned organizations support prescribed burning when used appropriately to prevent wild fires in standing forests in ways that are ecologically sound and culturally significant. Yet, we call into question lifting health protections related to how much smoke can foul the air, particularly in rural communities in order to allow more planned or prescribed burning.

The Environmental Quality Commission and Board of Forestry should consider the pros and cons of this rulemaking more closely. The following questions are not adequately addressed in the rationale for the rulemaking nor the rules themselves.

• Is Oregon definition of "prescribe burning" scientifically defensible and is it aligned with standards used by federal and science-based organizations?

• In which situations is prescribed burning sufficiently beneficial to justify smoke intrusions?

• Do the proposed rules increase dangerous levels of smoke in rural communities above what is known to be safe?

Definitions

Peer-reviewed sources define prescribed burning as ecological-based fuel reduction necessary to maintain the health of existing natural areas and living forests. Researchers conclude that the best way to prevent wildfires and restore ecosystem resilience is understory thinning with prescribed burning (Morgan, L., et al., "The carbon balance of reducing wildfire risk and restoring process: an analysis of 10-year post-treatment carbon dynamics in a mixed-conifer forest." US Forest Service Publication, 2015.). Prescribed burns are also defined as protocols to reduce hazardous fuel loads near developed areas and to maintain the health of existing natural areas and living forests. ("Wildland Fire: What is a Prescribed Fire?" National Park Service Wildland Fire Learning In Depth Series.)

Ecological-based fuel reduction in standing forests can reduce wildfire risk. However, burning slash piles of logging residue is not a tool to reduce wildfire risk. Slash piles and landing piles are situated on clear cuts or timber loading areas. The agencies have not provided evidence that individual slash piles in clear cuts significantly contribute to wildfire. However, the burning of slash piles and landing piles can cause smoke inhalation impacts in nearby residential areas.

We point out that the Smoke Management rule applies primarily to slash pile and landing pile burning (see 629-048-0310, Fees for Prescribed Burning). We urge the EQC and BOF to exclude slash pile and landing pile burning from rules that allow more frequent and more severe smoke intrusions and air pollution exposure in rural communities. Studies of wildfire patterns in managed and unmanaged forests conclude that managed plantation stands are more prone to severe fires. Fire risk is not associated with the presence of slash piles. It is related to the lack of species diversity, the structure of closely spaced trees and the ability of fire to leap from crown to crown, and the absence of green vegetative undergrowth that help retain moisture in the forest ecosystem.

Wildfires in Southern Oregon tend to **"**burn at relatively high severity in young naturally regenerated stands and even more severely in young conifer plantations of comparable age and fire history. This suggests that young forests, whether naturally or artificially regenerated, may be vulnerable to positive feedback cycles of high severity fire**.** The authors found that plantation forest burned with higher severities than comparable unmanaged stands (Thompson, J. R., Spies, T.A. and Ganio, L.M., "Reburn severity in managned and unmanaged vegetation in a large wildfire," Proceedings of the National Academy of Science, June 2007.). In a 2004 study of Oregon forest fires, authors found that fuel build-up in plantation forests "in the absence of fire did not cause increased fire severity as hypothesized…" Together with warming climate, plantation forests may increase the size and severity of future fires. (Odion, Dennis C., et al., "Patterns of Fire Severity and Forest Conditions in the Western Klamath Mountains, California," Conservation Biology, July 2004.)

Burning slash piles, landing piles and right-of-way piles are not types of prescribed burning that reduce wildfire risk. Burning slash piles, landing piles and right-of-way piles are a means to get rid of woody waste left onsite after logging operations. This is different than using prescribed burns to reduce the buildup of fuels on the forest floor, increase seedling vitality and reduce pest pressures, thus renewing forest resiliency. It is clear from the language in 629-048-0310, Fees for Prescribed Burning, that amended rules primarily benefit industrial timber land owners and do not promote ecosystem health.

We ask for peer-reviewed research and a science-based justification for mandating higher risks of smoke inhalation for the purpose of burning timber waste. The agencies have not provided evidence that slash piles and landing piles have been the cause of wildfires.

Slash burning on tree plantations should not be a reason to modify the Oregon's State Implementation Plan, the standards to ensure compliance with the federal Clean Air Act rules. The proposed rule changes to allow increased smoke intrusions should omit slash burns related to industrial clear cutting. We understand the need to reduce slash, but rural communities should not be required to take on the burden of poor air quality and increased health risks so that slash piles can be burned under weakened air quality rules. We suggest that the Departments of Forestry and Environmental Quality support forest management plans to re-use forest woody debris to rebuild healthy soils, create wildlife habitats or repurpose for commercial soil amendments
smaller represent a greater health concern than larger particles. Another pollutant of concern during smoke events is carbon monoxide. Carbon monoxide levels are highest during the smoldering stages of a fire. Smoke contains other strong respiratory irritants, including acrolein and formaldehyde. All of these air toxics contribute to poor air quality in general, which in turn impacts public health and livability.

Protecting Air Quality and Human Health

The proposed Smoke Management Rules will modify the State Implementation Plan from one that requires the prevention of smoke intrusions into communities permanent rules allowing more frequent and dangerous levels of smoke intrusions. Revisions to the definition of smoke intrusion (OAR 629-048-0005) will include a one-hour threshold of human exposure to fine particulate matter at or above 70 ug/m3, and a 24 hour average at or above 26 ug/m3, measured midnight to midnight on the first day of smoke entrance into a community.
According to the US EPA, smoke is a complex mixture of carbon dioxide, water vapor, carbon monoxide, particulate matter, hydrocarbons and other organic chemicals, nitrogen oxides, and trace minerals. The individual compounds present in smoke number in the thousands. Small, fine particulate matter (PM 2.5) is the principal pollutant of concern from wildfire smoke for the relatively short-term exposures (hours to days to weeks) that presents risks of negative public health impacts.
Smoke from both controlled fires and wild fires contain fine particles that can be inhaled into the deepest recesses of the lung and exchanged directly across cell membranes to enter the bloodstream. Thus, small particles can be respiratory irritants as well as posing dangers to the cardiovascular system in the form of strokes and heart attacks. It is well known that fine particles in the PM 2.5 spectrum or smaller represent a greater health concern than larger particles. Another pollutant of concern during smoke events is carbon monoxide. Carbon monoxide levels are highest during the smoldering stages of a fire. Smoke contains other strong respiratory irritants, including acrolein and formaldehyde. All of these air toxics contribute to poor air quality in general, which in turn impacts public health and livability.

Fine Particulate Pollution:

The Smoke Management rule would place Oregonians in harm's way by legalizing unhealthy levels of smoke to intrude into residential areas. The proposed rules would allow 70 μ/m3 of fine particle pollution during any one hour period. According to the US EPA Guidance on air quality impacts from wild fire, this creates air quality conditions in the "Very Unhealthy Range." The "Very Unhealthy Range" poses a high risk of:

Significant aggravation of heart or lung disease, premature mortality in persons with cardiopulmonary disease and the elderly; significant increase in respiratory effects in general population. ("Wildfire Smoke: A Guide for Public Health Officials," published by the U.S. Environmental Protection Agency, U.S. Forest Service, U.S. Centers for Disease Control and Prevention and the California Air Resources Board;, Revised May 2016, pp42-45)

The proposed 24-hour standard proposed in this Smoke Management rule permits the public to be exposed to 26 μ/m3 of fine particulate pollution. This is an average measurement taken over a 24-hour period starting at midnight the day of the first signs of smoke intrusion and ending at midnight the following day. Public health impacts associated with 24-hours of exposure to 26 μ/m3 (a measurement at the upper levels of what is considered "Moderate Range" of air quality) can cause *"possible aggravation of heart or lung disease."*

Comparing the proposed amendments to the Oregon Smoke Management Plan with the US Clean Air Act, it is apparent that exposure to 70 μ/m3 is very risky and unhealthy. The Clean Air Act requires the Environmental Protection Agency to establish air quality standards which are protective of public health and welfare. Currently, the Clean Air Act sets the standards for fine particulate matter (PM 2.5):

1. An annual particle pollution standard of 12 micrograms per cubic meter (12 μ/m3);

2. A 24-hour standard of 35 μ/m3.

We object to the proposal in the Smoke Management Plan to set the one hour exposure limit to 70 μ/m3,

which is two times higher than the allowable 24-hour levels of toxic air particles. This is certainly not safe for children or other vulnerable populations. We further object to setting the 24-hour limit as an *average* of 26 μ/m3 of fine particulate pollution, because by averaging the levels of pollution, there may well be periods of very high levels of PM 2.5 when the intrusion is at its peak. These peaks may be averaged out and unaccounted for, yet these levels may translate to very high risks to public health.

Other western countries regulate particulate matter more stringently than what is proposed in the new Oregon's Smoke Management Rules. For example, Canada has established seven health categories of 24 hour exposure to PM 2.5 levels. The Oregon proposed rules would allow 24-hour exposure to PM 2.5 at a level considered unhealthy for all members of the community:

Canadian Air Quality Health categories based on PM2.5 levels Health category	**24hr PM2.5 µg/m3**
Low	0–8.9
Moderate	9.0–25.9
Unhealthy – sensitive	26.0–39.9 [Oregon Proposed Smoke Rules - 26 ug/m3 -24hrs]
Unhealthy – all	40.0–106.9 [Oregon Proposed Smoke Rules - 70 µg/m3 -1hr]
Very unhealthy – all	107.0–177.9
Hazardous (high) – all	Greater than 177
Hazardous (extreme) – all	Greater than 250

The proposed Smoke Management Rules fail to align with Cleaner Air Oregon.

Proposed changes to the Smoke Management Plan are in opposition to DEQ's and OHA's efforts to reduce exposure to harmful air pollutants through the Cleaner Air Oregon process. ODF and DEQ must not circumvent the purpose and goals of Cleaner Air Oregon by allowing higher levels of air toxics caused by intentional burning, particularly in rural communities that are located near forest land. Existing Smoke Management statutes (OAR 629-048-0230 1(e)), set a goal of "avoiding" a situation where smoke pollution enters in to a Smoke Sensitive Receptor Area (SSRA). The proposed rules omit the original word "avoid" and substitute the word "minimize." This is not a subtle word change. The word "avoid" has a very clear meaning akin to *avert* or *circumvent*. However the word "minimize" more closely aligns with words like *lessen* or *reduce*. Substituting the word "minimize" assumes that exposure to dangerous amounts of air pollution is now acceptable. We strongly object to statutory language that legalizes harmful and dangerous exposures to particle pollution and poor air quality. Specifically, we object to the text modification of OAR 629-048-0230 1(e) and urge the DEQ and ODF to keep Oregon's original intention to make *avoidance* the goal of Smoke Management. The DEQ and EQC should not approve any amendments that increase the public's exposure to higher levels of PM 2.5 and air toxics in wood smoke.

Inadequate Science and Rationale to Justify the Rule Change.

The rules are not clear whether there are upper limits to the number of acres or the number of tons of fuel that may be burned as part of a single permit. The rules are also not clear about how many permits can be approved within an airshed and during what time interval.

Fails to Protect Children's Health.

The proposed rule changes are particularly harmful to children living in rural areas or SSRA's. There is nothing in this plan to protect young children and school children from exposure to dangerous levels of fine particulate and general poor air quality from smoke intrusions. The lack of attention to childhood health is at cross purposes with Cleaner Air Oregon. It is very troubling that the proposed rules seem to ignore the evidence of respiratory vulnerability of children, the elderly or infirmed, and pregnant women. Children, even those without any pre-existing or chronic conditions, are considered a sensitive population because their lungs are still developing, making them susceptible to air pollution.
Beyond Toxics objects to the absence of regulatory language to protect the health of children and health-vulnerable adults. We point out that the proposed Smoke Management Rules ignore public health information provided by Oregon state agencies. For example, the DEQ air pollution website states that exposure to fine particulate air pollution increases the risk of death from heart and lung disease as well as lung cancer. The DEQ also states that childhood asthma, triggered and exacerbated by fine particulate air pollution, is the most common chronic illness in children and the cause of most school absences. The Smoke Management rules must be more health protective and support the avoidance of smoke inhalation and its associated health impacts to children.

Community Response Plan and Exemption Request.

A new section of statute, 629-048-0180, proposes to create community response plans. The rationale provided is that community public health departments in vulnerable SSRA areas should take responsibility to alert residents when the potential for an increase in the amount of prescribed burns and resulting smoke impacts to communities exist. We suggest that this is an unfunded mandate for local communities. Who will pay for the development and implementation of the community response plans? Will County Public Health Departments be reimbursed for the costs in staffing and infrastructure? Will poorer rural communities go without a community response plan and suffer from smoke impacts because they are can't afford general funding, whereas wealthier communities will benefit from better planning and protections? Communities should not have to go into emergency mode in response to prescribed burning. The Agencies must come up with a plan to ensure equitable and full funding before saddling a public health department with this kind of unfunded obligation.

We point out the vague and questionable rule change in Section 2 (c) allowing a County Board of Commissioners to request an exemption to the one-hour smoke intrusion threshold. Is the exemption meant to improve public health or "to provide maximum opportunities" for prescribed burning? We object to any statutory language that creates exemptions that have negative impacts to public health. Rural communities cannot rely on "sheltering at home" as an emergency response plan. In their guidance document cited previously, the US EPA states that even sheltering at home is not a fully successful means of avoiding smoky air. It depends on how well a house limits smoke from coming in from outdoors. "Staying indoors works best in a tightly closed, air-conditioned home in which the air conditioner re-circulates indoor air … newer homes are "tighter" and keep ambient air pollution out more effectively than older homes." For communities with older homes and without air conditioning, the US EPA states that indoor concentrations of fine particles can approach 70 to 100 percent of the outdoor levels." In very leaky homes and buildings, outdoor particles can easily infiltrate indoors, so that staying inside may offer little protection. It follows that, in poorer rural communities with older homes, sheltering indoors is not helpful, which may constitute inequities and greater health impacts.

In summary, we urge the DEQ and the EQC to not approve the proposed changes to the Smoke Management Plan and the State Implementation Plan. As stewards of environmental protection and public health, we urge the EQC and BOF to postpone rulemaking until further study and consideration of the impacts of reducing smoke intrusion protections while increasing planned fires that may not reduce

wildfire risk.

At a minimum, we recommend the following actions:
1. Remove slash burning and landing burning in commercial plantation forest operations from the definitions of prescribed burning to reduce wildfire in this rulemaking.
2. Remove the ability of local governments to ask for an exemption to the hourly air quality standard.
3. Lower the exposure level of PM 2.5 during a smoke intrusion event for hourly and 24-hour exposures.
4. Ensure that Community Response Plan requirements are fair and equitable for less affluent rural communities with older housing stock, and provide funding for options other than sheltering in older residential buildings.

We are concerned that these rules increase air pollution, increase health risk in poor and rural communities but do not actually reduce wildfire risk. We support ecologically sound and culturally significant methods of reducing wildfire risk in standing forests. The proposed rules, as written, do not achieve this goal.

Lisa Arkin, Beyond Toxics

Steve Pedery, Oregon Wild

Response #127

Thank you for your comment. The action before the Environmental Quality Commission and Board of Forestry is to revise existing Oregon Administrative Rule. Only the Oregon Legislature has authority to revise the Oregon Revised Statute.

Guiding legislation for the Smoke Management Program directs DEQ and ODF to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes.

DEQ agrees that smoke impacts health, no matter the concentration, and that all communities should have the same expectations for clean air. DEQ also understands the need for communities to take steps to protect themselves from wildfire risk. For some communities, completing prescribed burns near the wildland-urban interface (WUI) is a key part of their strategic wildfire protection planning efforts. A review of past smoke management program burn results shows that smoke from burns that have been completed in the WUI is more prone to enter a community at higher concentrations but for shorter durations. DEQ agrees with the commenter that these impacts should be mitigated and that communities who complete these burns must provide proactive notification prior to burning. With the increased potential for smoke entering communities comes the increased need for proactive communications about prescribed fires and their potential impacts. The appropriate method for effective communication, and the type of mitigation that is needed, is dependent upon the community, which is why the proposed rules require ODF and DEQ to develop a communication framework for prescribed fires to be used throughout Oregon. This framework will include information that the public can use to protect their health from smoke. Communities who seek a waiver from the 1-hour average threshold will be required to develop a plan and program to proactively notify the public and mitigate impacts from these burns. The statewide framework may be used as a resource for communities as they develop these programs. The proposed rules require ODF and DEQ, in consultation with OHA, to review waiver requests.

Implementation of these community smoke notification and mitigation programs is not assigned to a local public health authority. The proposed rules requires a waiver requests to first be approved by a local authority (City or County) because of the increased public health risk that comes from increased smoke in the community. Communities that have established collaborative around prescribed fire have typically included public health authorities in their membership.

Comment #128

The Sisters City Council would like to thank you for the opportunity to provide comments to the Oregon Dept. of Forestry and Oregon Dept. of Environmental Quality concerning the proposed rule changes to Oregon's Smoke Management Plan.

This summers' fire season in Oregon and across the West is yet another indication that wildfires are becoming larger, more frequent, and more intense. The City of Sisters is taking proactive steps to reduce the risk of wildfires, including working with Community Planning Assistance for Wildfire (CPAW) to help our community become better fire=adapted.

The city supports the 24-hour NAAQS instead of the 1-hour threshold.

Our support for the rule package is contingent upon the inclusion of the provision providing communities with a clear, simple, and attainable process to obtain an exemption from the 1-hour smoke threshold when they have implemented a smoke communication and mitigation plan.

Thank you for the opportunity to provide comment on the proposed rules.

Chuck Ryan, Mayor

City of Sisters

Response #128

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implement mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

Comment #129

We appreciate the work by staff at the Oregon Department of Forestry (ODF) and the Department of Environmental Quality (DEQ) to develop new rules for Oregon's Smoke Management Plan and applaud the effort to revise the rules to strike more of a balance that recognizes the need for increased prescribed fire use and takes a more proactive approach to public health communication and mitigation. Early in the smoke management review process the Deschutes Collaborative Forest Project (DCFP) recommended changes to Oregon's Smoke Management Plan that would better align with the Environmental Protection Agency's (EPA's) science-based 24-hour National Ambient Air Quality Standards (NAAQS) for PM2.5. Our stakeholders also urged ODF and DEQ to better account for mounting threats posed by extreme wildfire to our forests, communities, and firefighters by revising the rules to provide maximum flexibility under federal law for prescribed fire in high-priority areas, such as the Wildland Urban Interface, to reduce risk of extreme wildfires. These were recommendations that garnered over 30 letters of support from diverse organizations across the state. The DCFP is encouraged to see that the proposed Smoke Management Rules with the NAAQS for PM2.5, including the proposed buffer of 75% of the NAAQS, to define smoke intrusions align with our widely supported recommendation. However, we have significant concerns with the addition of the one-hour PM2.5

threshold to define smoke intrusions and cannot support its inclusion as a standalone rule in the proposed plan because of the undue burden it will place on communities in and around fire-prone forests. Our efforts to increase the strategic use of prescribed fire in the forests immediately around our communities and analysis of the resultant smoke impacts has demonstrated that the addition of an arbitrary one-hour PM2.5 threshold would have the unintended consequence of limiting the use of prescribed fire at meaningful scales in the very locations where wildfire risk often greatest. We know this to be true in Central Oregon and believe it will be true for other communities actively working to increase the strategic use of prescribed fire to reduce wildfire risk.

The definition of smoke intrusions and how intrusions are used by state agencies are of particular concern because in our experience locally, past intrusions have been used to limit acreage, tonnage, timing, and duration of planned burns conducted under similar conditions and locations. Many of the key locations that need prescribed fire to protect human life, valuable infrastructure and natural resources are the same areas that are extremely difficult to burn without creating short-duration smoke impacts in nearby communities. If we continue to be overly restrictive of prescribed fires we only increase our risk of extreme wildfire in these locations in the future, with a wide range of severe ecological, economic, human health, and public safety consequences. For this reason, the DCFP's support for the proposed rules is subject to the inclusion of the opportunity for communities to receive an exemption to this one-hour PM2.5 threshold through a process that is clear, achievable, and realistic. We propose modifying OAR 629-048-0180 from what is currently proposed and have attached (1) our suggested changes, including a framework for the exemption process and criteria for developing locally appropriate smoke communication and mitigation plans.

From the outset of the review process we have emphasized the importance of taking a more proactive approach to communicating and mitigating public health impacts caused by smoke, regardless of the source. For this reason, we have formed a new partnership in Central Oregon that includes prescribed fire practitioners, land management agencies, air quality specialists, and public health experts to improve coordination and effectiveness of proactive communication with the public regarding when and where smoke may be expected and what the public can do to mitigate the impacts of smoke on their health. We are hopeful that this approach may serve as a model for a pathway to achieve an exemption from the one- hour threshold being proposed by these rules.

Each passing wildfire season provides further evidence that extreme wildfires are increasing in frequency, size, intensity, and duration. By mid-century the Pacific Northwest is projected to experience a 78% increase in area burned annually by wildfire. The DCFP will not sit idly by and let this happen, particularly when the science is clear (2) that tree thinning followed by prescribed fire can significantly reduce future wildfire severity, and thereby reduce the associated risks posed by extreme wildfires to forests, communities, local economies, and public health and safety. We need to act now to change the Smoke Management Plan. The fire-prone dry forests of central (and southwest and eastern) Oregon will burn sooner or later. Our choice is when and how they will burn: in a controlled way during carefully planned and implemented prescribed fire or during out of-control wildfires. We urge you to move forward with these proposed changes.

Sally Russell, Deschutes Collaborative Forest Project Chair

Ed Keith, DCFP Vice-Chair

Response #129

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the

protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implement mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

Comment #130

On behalf of KS Wild thank you ODF and DEQ for the opportunity to comment on the proposed changes to the Oregon Smoke Management Plan. The 2018 fire season shows yet again that we need to increase the use of prescribed fire on our forested landscapes, especially near our homes and communities. A rule change that facilitates more prescribed burning across land ownerships will reduce the amount of fuels contributing to large scale intense wildfires. Prescribed fire provides an essential tool to take proactive steps to reduce the fire hazard around communities and restore forest conditions, especially in light of climate change. I support the work by ODF and DEQ in providing public meetings and comment opportunities. I support the agencies work to align Oregon's Smoke Management Rules with the Clean Air Act 24-hour National Ambient Air Quality Standards (NAAQS). It is important to maintain a balance between public health and reducing fire hazards in the lands that surround our homes and communities. I am concerned that the proposed 1-hour threshold limits the amount of prescribed burning conducted. This will impose unnecessary restrictions on critical prescribed burning priority areas that are most vital to reducing smoke effects from wildfires here in Southwest Oregon. I support a clear, simple, and attainable process to obtain an exemption from the 1-hour smoke threshold when communities have implemented a smoke communication and mitigation plan.

Many of the fire prone forests of southern Oregon are arranged in a checkerboard ownership pattern with industrial land interwoven with Southern Oregon BLM Lands. Industrial timber plantations have been proven by science to burn faster, hotter, leading to more smoke production than natural forests. In addition to increasing prescribed fire and slash disposal, ODF should consider rules to ensure that private industrial forest practices do not increase future fire hazards and smoke production by limiting clearcutting and the production of activity slash. Also, aerial herbicides application and the practice of "hack and squirt" can cause widespread hardwood die-off, leaving senescent, dry vegetation on site and increase fire hazards on the landscape.

I support the development of a community response plan that works with the community to determine its contents. We support the objectives of notifying residents of (1) the purpose and importance of prescribed burning, (2) the health risks of wildfire and prescribed fire smoke, (3) how local officials and the public can find out about daily burn plans and emission reduction actions in their area, and (4) notification of smoke anticipated entering into specific sensitive smoke areas.

I would like to see ODF, DEQ, and federal agencies do an assessment of kraft paper as an alternative to polyethylene plastic for curing burn piles. Kraft paper is a cleaner, less toxic burning alternative. Burning polyethylene is a health hazard to crews and the public. We can reduce public health impacts and encourage prescribed burning by using slash paper instead of polypropylene to keep slash piles dry before their ignition date. I would also like to see ODF encourage the production of biochar in project as this method of burning can store far more carbon.

As the affected public I have a vested interest in providing these comments to influence when and to what degree the lands within Southwestern Oregon will burn. Using prescribed fire in forest restoration projects under the correct weather conditions will allow smoke to penetrate into the atmosphere and not remained trapped, as it often does in the Summer months.

Brodia Minter, Klamath Siskiyou Wildlands Center

Response #130

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implement mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

DEQ also encourages the commenter to review the research paper provided in the EQC briefing for this proposed rulemaking on the emissions from the combustion of polyethylene during prescribed fire pile burns

---

Comment #131

We support the development of a community plan that explains the importance of prescribed burning to mitigate wildfire and wildfire smoke. This includes ample notification to the public of when prescribed burning is likely to occur, notification to vulnerable residents of the likelihood that there may be smoke from prescribed burning, and help implementing actions residents can take to reduce exposure. Refrain from post fire logging and allow forests to naturally heal after wildfire. ● Avoid replanting dense single- species tree farms that may increase fire hazard. ● Retain undisturbed backcountry wildlands. ● Reduce the legacy sediment impacts of logging road networks.

Michael Smith

Response #131

Thank you for your comment.

Comment #132

I live near Redmond, Oregon, on a rural residential property. While the eastside forests are more than 20 miles away, we receive smoke from prescribed burns in addition to wildfires. Recently, we have experienced a significant number of days per year when smoke levels have been such that we have been forced to stay indoors, and when the Three Sisters and Mt Jefferson (Class 1 areas) have been virtually invisible. To live in an area known for its outdoors lifestyle and to not be able to venture outside for extended periods is depressing. Even more, to look forward to more days of (intentional) smoke in fall and spring, is disturbing.

Overall, I support the efforts of DEQ and ODF to reform the smoke management rules, and I encourage data collection and reporting (including to the public) to review decisions and results. I also encourage timely communication with the public on days of planned burns.

I do however have some suggestions.

I support the effort to measure 1-hour and 24-hour total PM2.5 particulate levels to manage prescribed burns for smoke incidents and intrusions. However, I suggest that the number of polluted days that an area has already suffered through within the year also needs to be considered.

'Urgent action' responses should be set in place before observed levels reach those that impact the health of sensitive groups. Under no circumstances should a prescribed burn cause a 24-hour average of 35 ug/m3 to be exceeded. Multiple exceedances can result in a violation of the NAAQS, the consequences of which are quite onerous.

I also am concerned about the apparent decision to exclude from consideration the health of people who do not live in SSRAs. About one-third of the population of Deschutes County (around 64,000 people) lives outside UGBs. Permitted smoke in these areas appears to be unconstrained by the smoke management plan. I suggest that the populated rural residential areas surrounding UGBs be included as part of the SSRAs.

- A balance needs to be struck

The health of the forest is important, but so is the health of the citizens. Not everyone can leave and go elsewhere when pollution becomes too irritating or unhealthy. Not everyone can merely 'stay indoors and turn on the air conditioner' - some people work outside, and some can't afford the air conditioner or an air purifier and the electricity to run it. Many persons in Central Oregon do not have air conditioning, opting instead to open their windows at night to introduce cool air into their houses. With ground level smoke appearing in the cool, calm, very early hours of the morning, windows must remain shut, and heat can build-up making for unpleasant conditions inside.

There is a real risk of people moving away from regions that receive a lot of smoke, as they perceive those areas to be unhealthy for themselves and their children or elders. There is a real risk of visitors not coming to the area, thus affecting the recreation and resort economy. In 2017, the City of Sisters had to cancel a major event due to smoke; it was estimated that $1.2 million was lost to the City. While this was due to a singular wildfire, I would suggest that once people come to expect repeated doses of smoke that will irritate their lungs and potentially damage their health, and that obscures the views and hinders outdoor activity, the economy of Central Oregon will be affected.

Further, I suspect that controlled burns will be needed for decades to come given the vast acreages that need treatment and the limited funds and personnel available. Smoke from these burns thus will not just result in short-term exposure. There are long term cumulative effects on the health of persons (both current and future Oregonians) living for years in areas receiving repeated smoke incidents and incursions, be they from wildfires or prescribed fires.

It is thus important that a balance be achieved between the need to manage smoke exposure and the need to reduce the potential of large forest fires.

- Be versatile

Prescribed burning is just one of several tools available to reduce fuels. The different types of forests and rangelands, and ecological conditions across Oregon dictate that no one fuel reduction technique should be solely favored, and that some techniques need to be undertaken in combination. Besides the use of prescribed fire, options include cheat grass reduction, thinning of dog hair stands of trees, removal of ladder fuels, shrub mowing (in areas where roads already exist), and perhaps even

limited grazing as is done using goats in the East Bay Regional Park District (Oakland, California)[1].

If not already done, I suggest that an emphasis be placed first on reduction of fuels by methods more amenable to public health, with follow-up of prescribed burning to finalize the treatment. Perhaps there could be some incentive to ensure that true consideration is given to these alternatives.

- Setting Intrusion Levels

Recognize that the NAAQS 24-hour standard of 35 ug/m3 (lowered by USEPA from the previous level of 65 ug/m3 in 1997) may underestimate health risks. In Australia[2], the 24-hour standard is 25 ug/m3 (a guideline also set by the WHO[3]); in Canada[4], it is 28 ug/m3.

I suggest that the proposed 24-hour level of 26 ug/m3 for smoke intrusions be a rolling average instead of a midnight-to-midnight measurement. This would better integrate the immediate conditions with most recent hours of exposure. It would better capture the impacts of changing weather conditions, and thus would improve the likelihood of burns being planned when conditions are improving and reduce the likelihood when conditions are deteriorating.

There is no 1-hour standard in the NAAQS for PM2.5. In Victoria, Australia, EPA AirWatch describes 1- hour levels above 40 ug/m3 as unhealthy for sensitive groups. A level of 70 ug/m3 is indicative of Very Poor Air quality, the worst category (see figure below)[5]. I suggest that instead of using a single 1-hour measurement, a 1-hour rolling average over 2 or 3 consecutive hours might be a better metric so as to smooth out wayward short-lived spikes in PM2.5. The downside is that it takes up to 2-3 hours to decide if an ignition should be stopped. Because of the averaging and based on the Australian table, I would suggest using 60 ug/m3 instead of 70 ug/m3 as a more conservative approach to reducing harmful exposure.

Pollutant	$PM_{2.5}$ (24 hr)	$PM_{2.5}$ (1 hr)
Units	µg/m³	µg/m³
Very good	0 – 8.2	0 – 13.1
Good	8.3 – 16.4	13.2 – 26.3
Fair	16.5 – 24.9	26.4 – 39.9
Poor	25.0 – 37.4	40 – 59.9
Very poor	37.5 or greater	60 or greater

- Threshold Number of Days

In order to manage chronic particulate exposure from all sources in an area, I suggest using a threshold of the number of days in which a community is exposed to 24-hour average PM2.5 levels above 26 ug/m3 before more stringent conditions for prescribed fire are triggered. So, for example, if at any point in the 'smoke year' [6] an area has experienced more days than the threshold number of days

above 26 ug/m3, prescribed fires would only be allowed if smoke levels can be kept to below (for example) 17.5 ug/m3. If an area has experienced less than this threshold number of days of PM2.5 levels above 26 ug/m3, then prescribed fires could be more aggressively managed allowing for smoke levels up to a level of 26 ug/m3. A running total of days with PM2.5 levels above 26 ug/m3 would need to be maintained by DEQ and LRAPA (in Lane County) so that as the smoke year progresses burn managers would have the data immediately available to consider where and when to apply prescribed fires based on the status of the area under consideration.

The advantage I see in this approach is that areas that have experienced a bad wildfire smoke season (the threshold number of days is exceeded) would get a respite from intentional pollution for the rest of the year. Prescribed burns could be directed to areas that have been spared wildfire smoke in this year. This would require managers to be agile in their use of prescribed burns, but would not hinder the overall control of fuels. The chronic exposure by citizens to unhealthy PM2.5 levels would be controlled.

- SSRAs and other areas

Why are the cities of Sisters and LaPine not on the list of SSRAs? Both are UGBs with concentrations of people who are situated in locations susceptible to smoke.

OAR 629-048-0120 appears to indicate that the objective of the Smoke Management Plan is to minimize emissions and avoid smoke intrusions ONLY in SSRAs or recreation areas. This leaves a lot of people potentially exposed as the "main smoke plume is vented up and out of the SSRA". Almost 1/3 of Deschutes County population lives outside the SSRAs. Of that number, I would suspect that many live in rural residential areas within several miles of the UGBs of Bend, Redmond and Sisters.

Smoke intrusions or incidents appear not to apply to areas other than named SSRAs or areas that are heavily used by the public for recreation (OAR 629-048-0140). These SSRAs also appear to include the Oregon valleys that are susceptible to inversions in winter. But winter inversions also occur in Deschutes County when cold air drains from the mountains and wind speeds are low[7]. Thus, there are areas outside of UGBs in Deschutes County that can experience stagnant air and trapped pollutants over multiple days.

If there were a smoke intrusion into the SSRA, would it not be likely that the areas within a few miles of the UGB would also be affected? And if so, why exclude them from the SSRA protection?

I suggest that the SSRAs be expanded to include the area around the UGBs, perhaps guided by the population of census block groups, or more simply by applying an appropriate outside radius of several miles from the urban growth boundary. This is likely to pick up a significant portion of the rural population, and thereby help in preventing adverse impact to a greater proportion of the population.

Thank you for your consideration.

Susan Payne

http://www.ebparks.org/about/stewardship/grazing/benefits.htm)

http://www.environment.gov.au/protection/air-quality/air-quality-standards

whqlibdoc.who.int/hq/2006/WHO_SDE_PHE_OEH_06.02_eng.pdf

https://www.ccme.ca/en/resources/air/pm_ozone.html

https://www.epa.vic.gov.au/our-work/monitoring-the-environment/epa-airwatch/air-quality-categories;

https://www.epa.vic.gov.au/your-environment/air/air-pollution/pm25-particles-in-air

A 'smoke year', I propose, would start just before wildfire season at the end of the spring prescribed burn period.

https://www.bendbulletin.com/localstate/1708713-151/stagnant-air-in-central-oregon Payne Comments, 9/13/18 4

Response #132

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implement mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

Thank you for your suggestions on the revised intrusion thresholds. DEQ and ODF are maintaining alignment of the 24-hour average threshold with the National Ambient Air Quality Standard for Particulate Matter in the proposed rules as the thresholds purpose is to act as a buffer against NAAQs violations. The existing Smoke Management Program incorporates daily weather forecasting into the burn approval process.

Regarding your comment on a trigger when communities routinely exceed the proposed intrusion thresholds, the proposed rule language requires reporting and follow-up when an intrusion occurs. The follow-up is a route-cause analysis with ODF, DEQ, and the burner to determine why the intrusion occurred and how it can be prevented in the future. One of DEQ's roles is to monitor the air quality throughout Oregon for compliance with the National Ambient Air Quality Standards. ODF uses DEQ monitoring data when determine if a burn should be approved for any given day. Our network of monitors measures emissions from prescribed fire, along with all other sources of emissions (wood stoves, backyard burning, automobiles, etc.). These monitors ensure that DEQ and ODF have accurate information to make decisions before a burn is approved. DEQ closely coordinates with ODF on implementation of the Smoke Management Program to ensure that communities who are approaching the NAAQS are more carefully managed to prevent a violation of the standard.

Regarding your comment on the designation of SSRAs, DEQ agrees that Sisters and LaPine are not designated as SSRAs. Existing rule language allows for a community to petition DEQ and ODF for designation as an SSRA.

Comment #133

The letter would not copy to this document. The original letter is on file and can be made available upon request. Below is a summary of the letter:

The High Desert Museum is grateful for the opportunity to provide comments. They are proactively working on using prescribed fire on their property.

They support the 24-hour threshold, and the 1-hour threshold only if the exemption process is

available and is a clear, simple, and attainable process when an area has implemented a smoke communication and mitigation plan.

The fire-prone forests of Central Oregon will burn sooner or later. We can choose to do this in a controlled way during carefully implemented prescribed fire, or during raging wildfires. The impacts of prescribed fire will be far less than the impacts of wildfire and we urge you to adopt the proposed rules.

Dana Whitlaw, High Desert Museum

Response #133

Thank you for your comment.

Comment #134

On behalf of the Ochoco Forest Restoration Collaborative (OFRC), we thank you for the opportunity to provide comments to the Oregon Department of Forestry (ODF) and Oregon Department of Environmental Quality (DEQ) concerning the proposed rule changes to Oregon's Smoke Management Plan. This summers' fire season m Oregon and across the West is yet another indication that wildfires are becoming larger, more frequent, and more intense. In and around the Ochoco National Forest, we and our partners are taking proactive steps to reduce the risk of such extreme wildfires, including the strategic use of prescribed fire in the forests immediately around our communities. To continue this work, we need a holistic and forward- thinking smoke management policy in Oregon.

We appreciate the work by ODF and DEQ staff in leading the smoke management plan review and we applaud the effort to align Oregon's smoke management rules with the federal Clean Air Act 24-hour National Ambient Air Quality Standards (NAAQs). We believe that using the NAAQS (including the proposed buffer of 75% of the NAAQS) to define smoke intrusions strikes an appropriate balance by addressing our shared interest in protecting public health, minimizing smoke entering communities, and allowing critical prescribed burning to occur as we work together to confront the very real wildfire threat facing our communities.

For this reason, we have significant concerns with the 1 -hour threshold, which runs counter to our interest in a smoke management policy that account for the short and long-term consequences of wildfire. Data shows that the I-hour threshold would impose a significant limitation on the very prescribed burning areas that are most critical to our community wildfire protection efforts here Prineville.

Consequently, our support for smoke management rule package is contingent upon the inclusion of the provision providing communities a clear, simple, and attainable process to obtain an exemption from the 1-hour smoke threshold when they have implemented a smoke communication and mitigation plan.

Thank you for the opportunity to provide comment on the proposed rules. The fire-adapted forests of the Ochoco will burn sooner or later. Our choice is when and how they will burn: in a controlled way during carefully planned and implemented prescribed fire or during out-of-control wildfires. In light of the science on this topic, we believe that the short-term impacts of prescribed fire will be far less than the impacts of wildfire in the long-run and we urge you to adopt the proposed rules so we can do what is needed to protect our forests, communities, and firefighters now and in the future.

Michelle McSwain, The Ochoco Forest Restoration Collaborative

John Jackson, The Ochoco Forest Restoration Collaborative

Response #134

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the

protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implement mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

Comment #135

As the athletic director at Crook County High School in Prineville, Oregon, the increasing prevalence of fires and smoke throughout the months of August and September have had a dramatic impact on our athletic programs. As a result of the smoke, fall sports practices have been forced inside where proper accommodations are difficult to create. Additionally, a number of late summer and early fall athletic competitions have had to be cancelled. This, unfortunately, has a negative impact on the physical fitness, mindset, and education of our student athletes. It seems the number of days "unhealthy to sensitive groups" have been increasing the last few years.

It is with this in mind that I write this letter in support of the exemption from the 1-hour smoke threshold. It is important to continue large scale prescribed burning to reduce fire risk during summer months. The 1-hour threshold would limit prescribed burning and would have a wide-spread negative impact. The work being done between the Oregon Department of Forestry and the Department of Environmental Quality to align with NAAQ's standards is accomplishing great things. We are simply asking that an exemption be in place if the 1-hour threshold is included in the final version Of the Smoke Management Plan.

Thank you for the opportunity to discuss this issue. Controlled burning is necessary to healthy forests and to limiting the catastrophic effects of wildfires. We urge you to implement an exemption to the 1-hour rule if adopted.

Rob Bonner, Crook County High School Assistant Principal and Athletic Director

Response #135

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implement mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

Comment #136

There is already only a small period of time during any given year when my community of Medford is not enveloped by smoke or fog. Regarding smoke, we have the major forest fires in the summer, slash burns by various governmental agencies in the spring and fall, and trash burns by

private landowners in spring and fall as well. I am against adding to this overload of bad air by any additional prescribed burns.

Alexander Maksymowicz

Response #136

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implement mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

As the commenter notes, the Smoke Management Program regulates one of many smoke sources. The Medfored-Ashland Air Quality Management Area is currently under a Maintenance Plan for Particulate Matter with a diameter of 10 micrometers or smaller (PM_{10}). This Maintenance Plan includes control strategies to reduce particulate matter emissions from a number of sources in the Medford-Ashland area. DEQ will begin an update of the maintenance plan in 2019 and encourages the commenter to participate in this planning effort. Concentrations of PM_{10} in the Medford-Ashland area have been below the National Ambient Air Quality standards for a number of years.

Comment #137

I would like to submit the following comments on the proposed DEQ rulemaking to adopt amendments to the Oregon Smoke Management Plan.

Three years ago I retired from DEQ Air Quality after 35 years, most of that time serving as the smoke management coordinator. I worked with the Oregon Department of Forestry (ODF) and was DEQ's lead staff in several of the periodic reviews of the smoke management plan, so I am very familiar with the program.

While I strongly support the program, and believe it has been effective over the years in managing prescribed burning and protecting air quality, several of the current changes being proposed are not adequately explained or fail to provide adequate information for the public to make an informed decision. I'm referring primarily to the proposed smoke intrusion definition and thresholds, and the elimination of requirements for polyethylene sheeting/covers on slash piles. It is my understanding that there is background information (i.e., recommendations from a review committee, an emissions study, and other written material) that supports these changes, but I don't see this information in the Notice of Proposed Rulemaking, nor a full explanation or summary of this background information in the Notice. From a process standpoint, the public needs to be provided with all necessary background information that served as the basis for the proposed rulemaking. Based on this, and as explained below in my comments, it is my recommendation that those amendments needing additional background information not be approved until the Notice is revised to address these concerns, and resubmitted to the public for review.

The following comments are based on the existing Notice of Proposed Rulemaking, in the Overview section, starting on page 8 that summarizes the proposed changes to the smoke

management plan, with references to the corresponding draft rules "with edits highlighted" starting on page 23.

Comment 1.

On page 8, under summary #1(b) "edits to the plan objectives", it states: "Provide maximum opportunity for essential forestland burning." OAR 629-048-0010 (4)(b) is new language that uses the word "essential", and there are other uses of this term in the proposed rules. However, there is no definition of what makes this burning essential. Recommendation: A definition of "essential" is needed, and provided for public review. If not, I would also support deleting this word from the new language.

Comment 2.

On page 8, under summary #1(f) "edits to the plan objectives", it states: "promote the further development of techniques to minimize emissions by encouraging cost-effective utilization of forestland biomass, alternatives to burning, and emission reduction techniques." This is a change from OAR 629-048-0010 (4) (e) that currently states "promote the reduction of emissions by encouraging…" etc. The distinction here is that "promoting the development of techniques" is not the same as "promoting the reduction of emissions." While new techniques are important, promoting a reduction in actual emissions is a higher priority. Recommendation: Modify this change. I support keeping the existing language, and then adding to it the proposed language on developing new techniques.

Comment 3.

On page 9, under summary #2, this is one of the more significant changes in this proposed rulemaking. "Revise the definition of smoke intrusion (OAR 629-048-0005) to include a one-hour threshold at or above 70 ug/m3 and a 24 hour average at or above 26 micrograms per cubic meter, measured midnight to midnight on the first day of smoke entrance into a community." It is my understanding that ODF and DEQ, working with the Smoke Management Review Committee, discussed this rule amendment in detail, and made recommendations supporting these two "thresholds" as the new definition of a smoke intrusion. But I cannot find any summary of this, or any explanation in the Notice. The existing definition in OAR 629-048-0010 (a)(b)(c) is based on light-scattering measurements (B-scat) measured by a nephelometer. This has been the measurement indicator historically for a very long time in documenting smoke intrusions of various severity. I see no explanation for replacing this indicator with a new one based on micrograms per cubic meter. How will new smoke intrusions be compared historically to old smoke intrusions? How will the performance of the smoke management program be evaluated over time without a consistent definition? It is understandable if the intent of this change is to align the definition of a smoke intrusion with the federal air quality standards for particulate matter, using micrograms per cubic meter, rather than B-scat. But here again, I see no justification provided for how the proposed PM 2.5 thresholds of 70 ug/m3 (1-hour average) and 26 ug/m3 (24-hour average) were selected, and how they compare the federal air quality health standard of 35 ug/m3 (24-hour average). In fact, using a similar measurement indicator gives the impression these thresholds are health standards, when they are not. Recommendation: I cannot support this change without additional information and the rationale on how and why these specific smoke intrusion thresholds were selected, and reasons why the old B-scat definition and measurement is no longer appropriate or needed.

Comment 4.

Related to Comment 2 above, there are no measures identified in the form of corrective actions,

when smoke intrusions in an SSRA exceed the proposed thresholds. What's the purpose of these thresholds if there are no consequences if they are exceeded? They appear to be only applicable to simply documenting that a smoke intrusion occurred. As noted in new section OAR 629-048-0110 (4), "Smoke incidents and intrusions will be documented and used to assess annual program performance. Department Directive 1-4-1-601 "Operational Guidance for the Oregon Smoke Management Program" will describe applicable reporting requirements and actions to be taken." This is the only place I can find in the rules which identifies a response to exceeding the thresholds. This hardly qualifies as a significant or meaningful response. Recommendation: Similar to Comment 3, I do not support this change. Additional rule provisions are needed which identify specific corrective actions and adjustments to future burning if these thresholds are exceeded. Without this, it hard to understand what benefit these thresholds provide outside of simply documenting smoke intrusions.

Comment 5.

On page 9, under summary #4 "Inclusion of a Community Response Plan and Exemption Request", this is a new rule section (OAR 629-048-0180). I support developing a community response and communications plan to address health concerns in SSRAs with a history of smoke intrusions. However, I fail to see the purpose of providing an exemption to the one-hour smoke intrusion threshold for communities that develop a response plan. The exemption in OAR 629-048-0180 (2)(c) is applicable "in order to provide maximum opportunity for essential forestland burning in the Wildland Urban Interface where wildfire risk to forest, communities, and firefighters is greatest." As noted in Comment 4 above, these thresholds are only being used to document a smoke intrusion. There is no rationale given in the Notice for not documenting a smoke intrusion, nor why documenting a one-hour intrusion would interfere with the ability to conduct "essential" forestland burning. If a smoke sensitive community with a history of smoke issues adopts a response and communications plan to address health concerns, all smoke intrusions over the one-hour threshold need to be documented. Recommendation: I fully support the new provisions for adopting a Community Response Plan, but do not support the exemption to the one-hour smoke intrusion threshold.

Comment 6.

On page 10, under summary #6 "Adding an alternative to burning recommendation of removing or minimizing large fuel concentrations and heavy fuel loadings to minimize smoldering." It's unclear where in the proposed rules this alternative can be found. If it's OAR 629-048-0200, Alternatives to Burning, under 1(e), further clarification is needed as to how this an alternative to the burning recommendation. Recommendation: I cannot support this change without further information.

Comment 7.

On page 10, under summary #7 "Allow increased usage of polyethylene sheeting on burn piles by removing the size limitation of 100 square feet and allowing the size of the sheeting to vary as necessary to achieve rapid ignition and combustion of the pile". This is somewhat misleading, as it implies there may still be some restrictions that apply. The only requirement that still applies for covers is that they are polyethylene and not some other material. Otherwise, the proposed rule change removes all restrictions, leaving it completely to the discretion of the forestland owner. This should have been more clearly stated in the Notice. More importantly, the summary mentions an emissions study that was conducted which showed polyethylene covers are effective in reducing emissions, and pose no adverse health risk from the burning of the polyethylene. This 2015 study served as the basis for making this rule change, yet outside of a one sentence description, there is no

additional information on this important study provided in the Notice. Recommendation: It is clear that results of the 2015 emissions study, as well as other research on this topic, show that polyethylene covers are an effective emission reduction technique. While I support this rule change, considerably more background information should have been provided to the public, in order to make an informed opinion.

Comment 8.

I fully support the inclusion of the new section and provisions in OAR 629-048-0021, entitled "Necessity of Safeguarding Public Health'. Recommendation: I support this change.

Comment 9.

It is noted in the History section of the Notice, and also reflected in ODF rules, that the overall objective of the smoke management program is to maximize burning opportunities, reduce the risk of wildfire, and minimize smoke impacts on the public. In theory, increasing the use of prescribed fire will ultimately help restore forest ecosystems and lead to a decline in the frequency and intensity of wildfire. However, given the magnitude of unhealthy forests at high risk of wildfire, and the random occurrence of these fires, a critical question is how many years of increased prescribed burning is needed to see a noticeable decrease in wildfire. Is it five years? Fifty years? A hundred years? Any smoke management program that seeks to maximize forestland burning in order to reduce the risk of wildfire needs to have some data to support this. Agencies such as ODF and DEQ need to be responsive to this need, and provide a "best estimate" of this timeframe, so the public better understands and ultimately accepts the need for more prescribed burning. With the increase in the number and severity of wildfires each summer, and the resulting impacts on air quality, any major increases in prescribed burning in the spring and fall burn seasons could result much more frequent exposure to smoke, both acute and chronic adverse health effects. This possibility is very real, yet there is currently nothing in the proposed revisions to Oregon Smoke Management Plan that addresses this issue. Recommendation: This proposed rulemaking falls short in addressing the need for any significant smoke management improvements, in light of expected increases in prescribed burning in Oregon. The US Forest Service, ODF, and other forest land management agencies, working with DEQ, need to provide an estimate of the timeline where the systematic application of prescribed fire over the next 10 to 50 years would be expected to improve forest health and result in a corresponding decrease in wildfires, using the best research tools available. Next, develop a strategy for restoring forest health by determining how much burning and where such burning should occur (e.g. in certain high risk wildfire areas), combined with the promotion and use of non-burning alternatives, as noted ODF rules (OAR 629-048-0200). This timeline and strategy should be reviewed by the public, and then incorporated into the Oregon Smoke Management Plan, prior to any major increases in prescribed burning.

Thank you for the opportunity to comment on this proposed rulemaking.

Brian Finneran

Response #137

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the

proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implement mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

Regarding Comment 1, no changes were made to the proposed rules. DEQ and ODF felt the language was clear in its representation of the policy objectives of the program.

Revisions to the proposed rule based on Comment 2. The proposed rule language now reads, "further development of techniques to minimize or reduce emissions…"

Regarding Comment 3, the proposed rule language has been updated to consistently reflect the change in threshold definition. The Smoke Management Program will determine smoke incidents and intrusions based on the concentration of particulate matter with a diameter of 2.5 micrometers or less ($PM_{2.5}$). Existing monitors that report in beta scattering are translated to $PM_{2.5}$ concentrations using a conversion factor. Where monitors are not available, the existing rule allows for the use of visible observation techniques to estimate emissions. DEQ and ODF are proposing to continue this practice, with the expectation that additional DEQ monitors will be installed throughout Oregon over the coming years to assist with program implementation and overall measurement of $PM_{2.5}$ concentration in the State. The proposed change to concentrations of $PM_{2.5}$ aligns Smoke Management Program metrics with existing tools that DEQ uses to communicate with the public (DEQ's Air Quality Index and DEQ's AirNow webpage and mobile application). The proposed 24-hour average threshold is in alignment with the National Ambient Air Quality Standards (NAAQS), and acts as a buffer against NAAQS exceedances. The proposed 1-hour average threshold serves as a trigger for the implementation of additional proactive communication and mitigation strategies at the community level. DEQ feels these metrics work in tandem to reduce smoke impacts while also increasing the opportunity of prescribed fire utilization in areas that communities have prioritized (like the wildland-urban interface).

Regarding Comment 4, revisions to the proposed rule language were made based on your comment. The proposed rule now includes triggers that limit a community's ability to utilize the waiver of the 1-hour threshold. If an area has had 3 or more intrusions (of the 24-hour threshold) in 5 years, or 2 exceedances of the NAAQS within that timeframe the exemption can be rescinded. In general, an intrusion triggers a root-cause analysis between ODF, DEQ, and the burner that evaluates why the intrusion occurred and what can be done to prevent the intrusion from happening again in the future. This practice has helped the program evolve over the years and is one of the reasons for the program's success limiting intrusions. ODF will continue to forecast for conditions and approve or deny burn requests based on their technical expertise, in alignment with proposed rule language.

Regarding Comment 5, the proposed rule language requires any smoke impacts above the proposed 1-hour average intrusion threshold that occurred in an SSRA that has a current waiver to be recorded as an incident.

Regarding Comment 6, the proposed rule language includes alternatives to burning (see OAR 629-048-0200). DEQ acknowledges the need for additional implementation of alternatives to prescribed fire. DEQ will continue to investigate and seek the implementation of alternatives to burning, such as biomass utilization for the development of products.

Regarding Comment 7, DEQ has included the research paper on emissions from the combustion of polyethylene covers in the package for presentation to the Environmental Quality Commission. Additional description of the research and its findings have also been included as part of the background to the EQC in their briefing materials on this rulemaking.

Regarding Comment 9, DEQ is aware of a number of existing prescribed fire notification processes utilized in Oregon. While these programs may be effective in their area, DEQ and ODF acknowledged the need for a statewide approach that communities could use in the development of their own prescribed fire notification and mitigation programs by including a requirement for its development in the proposed rules.

Comment #138

Kirk Schlesinger

There was not an attached file to respond to.

Response #138

Thank you for your comment.

Comment #139

RE: Rulemaking for Oregon Smoke Management Plan Revision and Update OAR 629-04

Dear Peter and Richard:

The Confederated Tribes of Siletz Indians (CTSI) appreciates the opportunity to comment on the proposed revisions to the Oregon Smoke Management Plan (SMP). We applaud the work of your department s to update the SMP to be more reflective of the current state of the environment and desired future conditions while still maintaining protections for those persons most susceptible to smoke related health issues.

For millennia CTSI's ancestors used prescribed fire as a tool to reduce the risk of wildfire and to enhance desired vegetation for both human and wildlife use. Traditional knowledge passed down from generation to generation dictated when it was safe and most effective to use fire to accomplish Tribal goals. The use of this practice has diminished greatly over the last 15 (years as human populations have increased and the federal and state policies of putting out all fires was put in place. The resultant unnatural increase in fuel loadings within the forest has led to these areas becoming increasingly susceptible to catastrophic wildfires, as we have been witnessing over the past few years. The warmer and drier summers predicted to result from climate change will only exacerbate the problem in the future.

Return of fire to the landscape in a controlled manner is necessary to reducing the risk of wildfires. Burning under controlled conditions during the wetter parts of the year will produce far less smoke than an uncontrolled wildfire. This can only occur, however, if the State’s smoke management policies align with the realities of when and how this can be safely accomplished. We believe that most of the proposed changes to the SMP are a step in the right direction. We support

the use of the Environmental Protection Agency's (EPA's) 24-hour National Ambient Air Quality Standards (NAAQS) for PM2.5 (including the proposed buffer of 75% of the NAAQs) to define smoke intrusions. We believe that this is the appropriate standard to use to protect public health in communities and Smoke Sensitive Receptor Areas.

We do not, however, support the additional use of the one-hour PM2.5 threshold to define smoke intrusions. We believe that use of this standard will result in unnecessary curtailment of otherwise necessary prescribed burning opportunities that are so badly needed in many areas. The provision in the proposed rules for communities to apply for and receive an exemption to the one-hour threshold is helpful, but in reality it is an unnecessary regulatory burden. We urge you to drop the one-hour PM 2.5 rule all together as it goes counter to your efforts to make controlled burns more feasible.

Thank you once again for the opportunity to comment on needed changes to the State's Smoke Management Plan. With the exception of the one-hour PM2.5 threshold CTSI fully supports the proposed changes.

Delores Pigsley, Tribal Chairman, Confederated Tribes of the Siletz Indians

Response #139

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implement mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA.

Comment #140

As a homeowner in the Sisters area, I would like to support modification of the smoke management program rules to allow for more prescribed fires in central Oregon forests. The science suggests prescribed fires in these forests can reduce the risk of much more catastrophic wildfires with more harmful impacts to human health. Please change the smoke rules to allow for more prescribed burns outside of the typical fire season. Thank you.

Kavita Heyn

Response #140

Thank you for your comment.

Comment #141

The Nature Conservancy is a global, science-based and non-partisan conservation organization. Our mission is to protect the lands and waters on which all life depends. The organization was incorporated in Oregon in 1961, and today we have over 50,000 supporters statewide with members in every county. Our staff, based in communities across the state, work collaboratively with tribes, government agencies, elected officials, private landowners, businesses, and community stakeholders

to develop innovative solutions to the major challenges facing people and nature.

We appreciate the work by staff at the Oregon Department of Forestry (ODF) and the Department of Environmental Quality (DEQ) to develop new rules for Oregon's Smoke Management Plan and applaud the effort to revise the rules to balance the need for increased prescribed fire use with a more proactive approach to public health communication and mitigation.

We support the alignment of the proposed Smoke Management rules with the Environmental Protection Agency's (EPA's) 24-hour National Ambient Air Quality Standards (NAAQs) for PM2.5. We believe that using the NAAQS (including the proposed buffer of 75% of the NAAQS) to define smoke intrusions is protective of public health (as supported by the EPA's most recent integrated review of particulate matter standards) and will meet the objective to minimize smoke entering communities and Smoke Sensitive Receptor Areas (SSRAs).

However, we continue to have significant concerns with the addition of the one-hour PM2.5 threshold to define smoke intrusions in the proposed rules, because it will impose limits that curtail the ability of communities in fire-prone forests to use prescribed fire at meaningful scales to address wildfire risk.

For this reason, our support for the proposed rules (including the one-hour threshold) is subject to the inclusion of the opportunity for communities to receive an "exemption" to this one-hour smoke threshold, contingent upon the development and adoption of a community response plan to address communication and mitigation of prescribed fire smoke impacts (provision 629-048-0180-3).

We have underscored from the outset of the review and rulemaking process the importance of taking a more proactive approach to communicating and mitigating public health impacts caused by smoke, regardless of the source. This provision balances the dual goals of enabling communities in the wildland urban interface to accelerate the use of prescribed fire to reduce wildfire risk while simultaneously establishing a proactive approach to reduce smoke impacts to the public and vulnerable populations.

Changing climatic conditions, including increasing temperatures and changes in precipitation are driving longer summers with increasingly frequent and severe wildfires. In the Pacific Northwest this is projected to lead to a 78% increase in area burned by wildfire by mid-century and a concomitant increase in severe wildfire smoke. Wildfires have been found to emit twice the organic aerosols and fine particulate matter as prescribed fires. For this reason, average PM2.5 emissions from wildfire are expected to increase 160% in the western U.S. by 2050, and by more than 400% in some regions therein. Unfortunately, Oregon is expected to be one of the areas hardest hit by these changes. Clearly, long-term air quality and long-term public health are inextricably linked to the health of our forests in Oregon. Fortunately, the science is clear that tree thinning followed by prescribed fire can significantly reduce future wildfire severity in western conifer forests, thereby reducing the associated risks posed by extreme wildfires to forests, communities, local economics, and public health and safety.

For these reasons, we support the proposed rule as presented by ODF and DEQ, providing:

1) The proposed exemption to the one-hour smoke intrusion threshold for communities with approved communication and mitigation plans is maintained in the final rule; and
2) The final rule outlines a clear, straightforward process with realistic, achievable, and time bound criteria for communities to follow to be granted an exemption. Communities need assurances that their communication and mitigation plans can be tailored to local needs and capacity, and that the exemption will be attainable in light of local realities. We have been working with other partners and several members of the Smoke Management Review Committee to develop proposed language for the exemption process based on six design criteria (see attached). We hope this will help advance development of locally appropriate

exemption protocol in the revised smoke management rules.

Thank you for the opportunity to provide comment. We greatly appreciate the work you and your staff have put into carefully and holistically considering the future of smoke management in Oregon, and its associated fire, air quality, and public health and safety challenges. We look forward to working with ODF and DEQ staff to help implement these rules once adopted by the Board of Forestry and Environmental Quality Commission.

Mark Stern, The Nature Conservancy

Response #141

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implement mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA

Comment #142

On behalf of the Ochoco Forest Restoration Collaborative (OFRC), we thank you for the opportunity to provide comments to the Oregon Department of Forestry (ODF) and Oregon Department of Environmental Quality (DEQ) concerning the proposed rule changes to Oregon's Smoke Management Plan. This summers' fire season m Oregon and across the West is yet another indication that wildfires are becoming larger, more frequent, and more intense. In and around the Ochoco National Forest, we and our partners are taking proactive steps to reduce the risk of such extreme wildfires, including the strategic use of prescribed fire in the forests immediately around our communities. To continue this work, we need a holistic and forward- thinking smoke management policy in Oregon.

We appreciate the work by ODF and DEQ staff in leading the smoke management plan review and we applaud the effort to align Oregon's smoke management rules with the federal Clean Air Act 24-hour National Ambient Air Quality Standards (NAAQs). We believe that using the NAAQS (including the proposed buffer of 75% of the NAAQS) to define smoke intrusions strikes an appropriate balance by addressing our shared interest in protecting public health, minimizing smoke entering communities, and allowing critical prescribed burning to occur as we work together to confront the very real wildfire threat facing our communities.

For this reason, we have significant concerns with the 1 -hour threshold, which runs counter to our interest in a smoke management policy that account for the short and long-term consequences of wildfire. Data shows that the I-hour threshold would impose a significant limitation on the very prescribed burning areas that are most critical to our community wildfire protection efforts here Prineville.

Consequently, our support for smoke management rule package is contingent upon the inclusion of the provision providing communities a clear, simple, and attainable process to obtain an exemption from the 1-hour smoke threshold when they have implemented a smoke communication and mitigation plan.

Thank you for the opportunity to provide comment on the proposed rules. The fire-adapted forests of the Ochoco will burn sooner or later. Our choice is when and how they will burn: in a controlled way during carefully planned and implemented prescribed fire or during out-of-control wildfires. In light of the science on this topic,

we believe that the short-term impacts of prescribed fire will be far less than the impacts of wildfire in the long-run and we urge you to adopt the proposed rules so we can do what is needed to protect our forests, communities, and firefighters now and in the future.

Bryce Kellogg

Response #142

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implement mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA

Comment #143

Please amend the Oregon Smoke Management Plan update as follows: Establish a smoke monitoring system that is adequate to measure actual smoke levels year-round. Please own up the total smoke in our air, not just from controlled burns (thus, including wildfires, woodstoves, backyard burning, industry, etc. Give assurance that "smoke traps" like the Rogue Valley will not be marginalized by the blanket, state-wide rules. Focus fuel-reduction efforts on high priority sites, such as homes and infrastructure, rather than on every acre in Oregon. Urge scientists to be clear about what benefits we can expect to receive if we, as a society, accept more smoke in our lungs (like, how many catastrophic fires will be avoided?). Please encourage a search for other, new means of using excess biomass from our lands, not just the easiest and most cost-effective means, burning. In fact, you should discourage burning, because we need to keep carbon in the vegetation, not release it through burning. In short, minimize the use of burning by every means possible.

Vern Crawford

Response #143

Thank you for your comment. DEQs air quality monitoring network currently collects concentrations of pollutants from all emission sources (woodstoves, automobiles, industrial activity, prescribed fire, etc.). The Smoke Management Program applies to prescribed burning of forest fuels for forest management purposes within any forest protection district in Oregon as described in OAR 629-041-0500 to OAR 629-041-0575. DEQ will continue to investigate and seek the implementation of alternatives to burning, such as biomass utilization for the development of products.

Comment #144

Department of Environmental Quality (DEQ):

Thank you for the opportw1ity to provide public comment regarding proposed amendments (or changes) to Oregon's Smoke Management Plan. As you consider changes, we encourage you to remember that DEQ efforts per ORS 477.552 should facilitate and integrate with DEQ responsibilities described in ORS 468A.

Pursuant to ORS 468A.010, such responsibilities involve restoring and maintaining the quality of Oregon's air resources "in a condition as free from air pollution as is practicable, consistent with the overall public welfare of the state [emphasis added]." Pursuant to ORS 468A.035, this effort should be executed via a comprehensive plan that controls or abates "existing air pollution [as well as controls or prevents] new air pollution in any area of the state in which air pollution is found already existing or in danger of existing [emphasis added]" in a manner that recognizes "the varying requirements for different areas of the state." Finally, per ORS 468A.005, wildfire smoke counts as a form of air pollution and wildfire its source.

Taken together, these statutes obligate DEQ to address future wildfires and wildfire smoke as far as "is practicable" to minimize and mitigate the impacts of future wildfire smoke across the state for the overall welfare of the public. Best available science shared throughout the Smoke Management Review process and subsequent public hearings demonstrate that combined use of mechanical thinning and prescribed fire implemented at scale can significantly mitigate wildfire behavior and minimize public health impacts from wildfire smoke.

Facilitating increased use of prescribed fire is therefore a smart, practical, and promising way for Oregon and DEQ to address and mitigate future health impacts from wildfire and wildfire smoke. We therefore support Oregon’s effort to facilitate increased use of prescribed fire on the landscape at scale as evidenced by proposed changes to its Smoke Management Plan.

Based on the fact best available science indicates wildfire smoke is far more harmful to humans than prescribed fire smoke, and EPA's 24-hour NAAQS is an evidence-based standard by which to evaluate smoke impacts to public health, we also support characterizing smoke intrusions per the 24-hour NAAQS Moderate Air Quality category as currently proposed.

In earlier comments to the Board of Forestry (dated June 6, 2018), we opposed using a 1- hour standard in addition to the 24-hour NAAQS to characterize smoke intrusions. We did so in part because we are not aware of any credible science that warrants using that standard to measure public health impacts. We remain opposed to using the 1-hour standard that way until science indicates otherwise given the importance of utilizing prescribed fire around communities in fire-adapted landscapes across Oregon.

However, the proposed rule changes do involve a significant departure from past practice, so we support using the 1-hour standard as a practical matter to complement EPA's 24-hour NAAQS given understandable public concerns with allowing any smoke intrusions however characterized. But we do so only if communities can request an exemption from the 1-hour standard (per the exemption language The Nature Conservancy and other others have submitted), and reasonably expect it will be granted. In closing, I want to compliment ODF, DEQ, and their respective Boards for tackling an incredibly important and contentious issue in a responsible and solution-oriented manner.

Mark Webb, Executive Director Blue Mountains Forest Partners

Response #144

Thank you for your comment. DEQ encourages the commenter to review comments provide by the Oregon Health authority, which sites multiple papers on the short-term health impacts from smoke. The proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implementation mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA. The science is clear that there is no safe level of smoke and DEQ believes that 1-hour average intrusion threshold serves an important trigger for communities to establish plans that meet the needs of their most vulnerable members while also meeting their priority needs regarding wildfire risk

reduction.

Comment #145

On behalf of the Southern Willamette Forest Collaborative (SWFC) we thank you for the opportunity to provide comments to the Oregon Department of Forestry (ODF) and Oregon Department of Environmental Quality (DEQ) concerning the proposed rule changes to Oregon's Smoke Management Plan. The SWFC is place-based forest collaborative located in Oakridge, Oregon that brings together partners to achieve forest projects that benefit the forest and surrounding communities. The SWFC members include local citizens, community organizations, government agencies, conservation groups and small forestry businesses. The SWFC partners are taking proactive steps to reduce the risk of catastrophic wildfires, including the strategic use of prescribed fire in the forests immediately around our communities.

The SWFC clearly understands the threats to human health and safety associated with smoke. During the winter months, Oakridge air quality is susceptible to high concentrations of wood smoke. For many years Oakridge was a designated Environmental Protection Agency (EPA) nonattainment area for fine particulate matter. The SWFC has worked closely with a coalition of partners to help Oakridge meet the 24-hour national air quality standards for PM2.5 and Oakridge has achieved measurable success towards this effort.

The topography in our watershed also makes Oakridge and Westfir susceptible to long lasting smoke inversions. In recent years, smoke from nearby wildfires has impacted our communities for weeks each summer, threatening human health and impacting the tourist economy. The SWFC is working closely with the Willamette National Forest, Middle Fork Ranger District to plan and implement forest restoration projects that improve forest health and reduce the risk of catastrophic wildfire. Prescribed fire use is a critical component of forest restoration and wildland urban interface fuels reduction. Yet, current smoke management guidelines restrict local Forest Service land managers to an average of five days per year to conduct prescribed fire burns. It is important that communities, regulatory agencies, and land managers recognize the future risk of wildfires in the face of climate change.

We appreciate the work by ODF and DEQ staff in leading the smoke management plan review and we applaud the effort to align Oregon's smoke management rules with the federal Clean Air Act 24-hour National Ambient Air Quality Standards (NAAQs). We believe that using the NAAQS (including the proposed buffer of 75% of the NAAQS) to define smoke intrusions strikes an appropriate balance by addressing our shared interest in protecting public health, minimizing smoke entering communities, and allowing critical prescribed burning. It is important that communities have a clear, simple, and attainable process to obtain an exemption from the 1-hour smoke threshold when they have implemented a smoke communication and mitigation plan – if the one-hour PM2.5 threshold to define smoke intrusion is adopted.

Thank you for the opportunity to provide comment on the proposed rules. In order to truly make progress towards increasing the pace and scale of forest restoration, and improve forest resilience, fire must be reintroduced to the landscape in a safe, controlled way. The short-term impacts of prescribed fire will be far less than the impacts of wildfire in the long-run and we urge you to adopt the proposed rules so we can do what is needed to protect our forests, communities, and firefighters now and in the future.

Sarah Altemus-Pope, Coordinator, Southern Willamette Forest Collaborative

Response #145

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implement mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA

Comment #146

The USDA Forest Service and the USDI Bureau of Land Management appreciate the work by staff at the Oregon Department of Forestry (ODF) and Department of Environmental Quality (DEQ) to revise the existing State Smoke Management Plan (SMP) to balance the increased need for prescribed fire use with a more proactive approach to public health communication and mitigation. This letter is in response to the request for comment on the proposed rule changes to OAR 629-048-0001 through 629-048-0500, with particular attention given to the new definition of a smoke intrusion and the added section 629-048-0180 Community Response Plan and Exemption Request.

We have reviewed the proposed changes to the SMP, which includes both the Smoke Management Rules and the Department Directive 1-4-601 "Operational Guidance for the Oregon Smoke Management Program." We are supportive of several aspects of the proposed changes, including the change in the definition of a smoke intrusion to a health-based threshold, the increased use of polyethylene covers on piles, and the use of community response plans. However, we remain opposed to the continued use of the 1-hour averaging period to define a smoke intrusion. The exemption process does appear to provide an alternative path for allowing more prescribed burning, but the process is unclear and complex. We also have concerns regarding the use of smoke incidents which could perhaps unintentionally result in further limitations to prescribed burning.

We appreciate your consideration of our comments which provide suggested improvements and clarity to the proposed rule changes. They help to maintain maximum flexibility to accomplish our mission of restoring and maintaining healthy forests and reducing the negative consequences of wildfire, including air quality impacts.

We appreciate the work you and your staff have put into carefully and holistically considering the future of smoke management in Oregon and its associated fire, air quality, public health, and safety challenges. We look forward to working with ODF and DEQ staff to help implement these rules once adopted by the Board Of Forestry and Environmental Quality Commission.

General Comments

Section 477.522 of the Oregon Revised Statutes Section 477.522 of the Oregon Revised Statutes identifies the smoke management policy of the State of Oregon as follows:

(1) To improve the management of prescribed burning as a forest management and protection practice; and

(2) To minimize emissions from prescribed burning consistent with the air quality objectives of the Federal Clean Air Act and the State of Oregon Clean Air Act Implementation Plan developed by the Department of Environmental Quality under ORS 468A.035 (General comprehensive plan). [1989 c.920 §2]

However, the following sections of the Smoke Management Plan (SMP) state "minimize emissions" rather than using language that would be consistent with the Clean Air Act (CAA) and State Implementation Plan:

- 629-048-0021 Necessity of Safeguarding Public Health, paragraph (2)
- 629-048-0120 Air Quality Maintenance Objectives, paragraph (4 and 5)
- 629-048-0130 Visibility Objectives, paragraph (2a);
- 629-048-0210 Best Burn Practices, Emission Reduction Techniques, paragraph (1); and
- 629-048-0230 Burn Procedures, paragraph (6b)

The inconsistency is causing some confusion and may result in variations in interpretations and implementation actions.

Please clarity what is meant specifically by "… consistent with the air quality objectives of the Federal Clean Air Act and the State of Oregon Clean Air Act Implementation Plan developed by the Department of Environmental Quality under ORS (General comprehensive plan). [1989 c.920 §2]."

If the difference in language is simply a shortened way of stating what is in the Statute, then please clarify at every use within the SMP. If the intention of the Department of Environmental Quality (DEQ) and Oregon Department of Forestry (ODF) is to truly minimize emissions as the desired outcome, please clarify where the authority for minimizing emissions originates.

We are supportive of the change of the definition of a **smoke intrusion** (Paragraph 27) from any increase above background to a value associated with health-based thresholds such as the 24- hour National Ambient Air Quality Standards (NAAQS). However, we are not supportive of the use of a sub 24-hour threshold (e.g., a 1-hour average) for defining a smoke intrusion because (1) it is unsupported by scientific evidence, and (2) it will impose limits which curtail the ability of communities in fire-prone forests to use prescribed fire at meaningful scales to address wildfire risk. We recommend removing the 1-hour smoke intrusion threshold and using the 75 percent of the 24-hour NAAQS as the intrusion threshold, as was suggested at the June meeting of the Oregon Board of Forestry.

Paragraph (28) defines the term **Smoke Incident.** Throughout the many discussions of the Smoke Management Review Committee, the smoke incident concept has been portrayed as simply an internal metric for the SMP. However, as currently written in the proposed revisions to the rule, smoke incidents can limit our bum programs in a number of ways.

For example, in 629-048-0150, paragraph (1a), smoke incidents are identified as a criteria when considering establishing future Smoke Sensitive Receptor Areas (SSRA). The proposed definition of a smoke incident states that a smoke incident can occur anywhere, i.e., "other areas sensitive to smoke, or a community other than an SSRA." Currently, our burners have to focus on avoiding smoke impacting SSRAs. However, with this new definition, our burners now must avoid smoke, no matter the level, in all areas sensitive to smoke and other communities which are not SSRAs. With the large amount of future Wildland Urban Interface (WUI) burning planned, we are concerned about the number of new SSRAs which may get established and further limit our ability to conduct prescribed burning where it is greatly needed. If you decide to leave the term "smoke incident" in the revised rule, please define the term "areas sensitive to smoke." We request that smoke incidents be removed as a criteria for consideration of establishing new SSRAs.

We also are concerned about monitoring, documenting, and reporting on smoke incidents and using this information in the evaluation of the smoke management program. It is unclear how this information is used to meet any of the expressed purposes of the SMP or the policy objectives, such as improved implementation of the CAA or the NAAQS. Please clarify why *you* are tracking this information and how it will be used in program evaluation. If smoke incidents are used to assess annual program performance, it would be in the interest of

those administering the program to limit the number of incidents. Consider places like the Deschutes National Forest, where a bum near the WUI of any size will result in a smoke incident and ultimately be limited to improve program performance, which seems counter to the intent of these rule revisions. We request that ODF not include smoke incidents in the annual report or use this information for evaluating the Smoke Management Program.

Additionally, we are concerned about how determining smoke incidents could negatively affect our staff time. As currently defined, a "smoke incident" means the verified entrance of smoke from prescribed burning into an SSRA at levels below a smoke intrusion, other areas sensitive to smoke, or a community. As we have learned, it is not always quick and easy to determine if described burning caused, in whole or in part, elevated levels of smoke. It is often assumed, unless we can prove otherwise, that our bums caused the elevated levels of smoke. Sometimes *Ne* have to make calls, look at satellite images, and even run models to determine the likely cause of smoke. This seems like an unnecessary effort for a level of smoke below that thought to be of concern. We request modifying the proposed rule to eliminate the concept and use of smoke incidents all together.

Please add definitions to the following terms:

- Adversely affected by smoke
- Areas sensitive to smoke
- Maximize opportunity for essential forestland burning
- NAAQS exceedance
- Verified entrance of smoke
- Vulnerable populations

629-048-0005 Definitions:

629-048-0020 Necessity of Prescribed Burning

In paragraph (2), please add the following sentence after the first sentence: "In fire-dependent ecosystems, frequent wildfire itself serves to limit the spread of subsequent fires, thus becoming a self-regulating natural disturbance."

In paragraph (6), please add the following sentence: combined with prescribed burning is an effective method to reduce flame lengths; rate of spread; and risk to firefighters, communities, and highly valued resources and assets".

629-048-0021 Necessity of Safeguarding Public Health.
We would like to see the smoke management rules acknowledge that prescribed burning can help safeguard the public by reducing the negative consequences of wildfire. Under the right conditions, wildfires that intersect with areas which have been treated with thinning and prescribed burning experience reduced flames lengths, slow rate of spread, and fire moving from the canopy to the surface. These conditions allow firefighters to engage directly with the fire and thus contain the fire. In these cases, the wildfire could potentially have burned tens of thousands of acres more than if it had not interacted with previously burned units. The reduced size of the fire naturally emits less smoke than if those acres did burn. In these situations, downwind air quality impacts are also reduced as a result of prescribed burning.

In paragraph (2), please change the sentence to read: "To help minimize the health risk to the public from prescribed burning, the program encourages prescribed burning to minimize emissions consistent with the air quality objectives of the Federal Clean Air Act and the State of Oregon Clean Air Act Implementation Plan, and avoid smoke intrusions.

629-048-0110 Characterization and Response to Smoke Incidents, Intrusions, and NAAQS Exceedances

In paragraph (la), please add the please add the phrase “or a NAAQS exceedance” to distinguish between a smoke intrusion and a NAAQS exceedance.

In paragraph (3), we are concerned about the use of the National Weather Service (NWS) method to determine smoke concentrations when no instrument observations are available. Please recognize that these two methods operate on different averaging times, where the NWS method of human observation occurs in a few seconds as opposed to a I -hour or 24-hour average, which is used to measure smoke incidents, intrusions, or NAAQS exceedances. Because of the inherent variability of an instantaneous PM2.5 concentration over a 1 -hour period, there will naturally be times of lower and higher concentrations, sometimes orders of magnitude difference. As such, it is inappropriate to use a human observation technique for determining a threshold which could potentially limit the amount of prescribed burning. Additionally, there are more factors such as humidity and human error associated with the observation as compared with using an instrument measurement. As such, this method should not be used to evaluate smoke concentrations, incidents, or intrusions.

629-048-0120 Air Quality Maintenance Objectives

This section discusses the interplay between prescribed burning and areas which have previously been in non-attainment with national ambient air quality standards, but now are, and are working under an air quality maintenance plan to keep them in attainment.

Please delete the reference to the term "play or exercise" from paragraph (3). Mountain biking and hiking are very common activities on our public lands. It is not uncommon to see mountain bikers riding near burn units which are actively being treated with prescribed burning. It is not reasonable to minimize the amount or duration of smoke in and adjacent to these burn units, other than warn the public that prescribed burning is being conducted. People want access to their public lands.

Paragraph (6) of this section has some new language which states: "They (burn bosses) should suspend lighting if necessary..." We recommend changing the sentence to read "They should alter or suspend lighting if necessary. This allows more flexibility on the part of the burn bosses to achieve the air quality goals without unnecessarily stopping a burn. This may include just slowing the rate of ignition, or modifying the ignition technique to add more heat so the plume has more lift and does not impact the ground.

629-048-0130 Visibility Objectives

As presented, this section is missing the larger and longer-term perspective on visibility. Please add the following statement: "Just as fire is a natural part of the ecosystem, so is the smoke. When we replace natural fire with prescribed fire, it is expected that smoke will sometimes reduce visibility, even in Class I areas."

629-048-0137 SPZ (Special Protection Zone) Contingency Plan Requirements

On October 3, 2016, the Environmental Protection Agency (EPA) issued its final rule on the treatment of data influenced by exceptional events (aka, the Exceptional Event Rule). In that rule, the EPA states that the CAA recognizes that it may not be appropriate to use the monitoring data influenced by "exceptional" events that are collected by the ambient air quality monitoring network when making certain regulatory determinations. Smoke from prescribed burning can be considered an exceptional event under certain conditions. The smoke management rule, however, never mentions the potential use Of the Exception Event Rule, thus being blind to the Federal process.

Going into non-attainment status has significant negative economic consequences, which could be avoided

through use of this rule. Economic consequences may include the cost to the DEQ and EPA in developing and approving a State Implementation Plan, loss of Federal highway dollars to maintain roads, and lowered desirability from a new business and a residential point Of view. Thus, by not making use of this rule making tool, the ODF and DEQ are creating potential serious consequences which could be otherwise avoided. Please modify this section of the SMP requiring the DEQ to utilize the Exceptional Event Rule to prevent an area from going into non- attainment status unnecessarily.

In paragraph (1), please clarify why the Smoke Protection Zone (SPZ) zone in Klamath Falls will be extended from February 1 5 to April l, as compared with all other areas in the State where they will be extended from February 15 to March l. In other words, in the event that prescribed buming is determined to be a significant contributor to an exceedance of the 24-hour average PM2.5 NAAQS, the SPZ restriction will be extended two weeks in all other locations except Klamath Falls, where it will be extended six weeks regardless of when the exceedances occur. Please revise this section such that prescribed burning that may impact Klamath Falls is not unnecessarily restricted by only extending the SPZ period until March I instead Of April l.

629-048-0180 Community Response Plan and Exemption Request

We support the inclusion of a process for exemption from the 1-hour smoke intrusion threshold as a means of helping communities prioritize and manage risk from wildfire and maintain healthy forests and communities. We believe this process needs to be straightforward with specific measureable, achievable, realistic, and time-bound criteria, without ambiguity and subjectivity, for communities to follow to be granted an exemption. In addition, we feel it should build off of existing plans.

We also believe communities should be encouraged to use existing plans such as Community Wildfire Protection Plans (CWPP) rather than requiring the creation of a new stand-alone document. The community response plan should be part of the CWPP. Currently, there are 36 CWPPs available online at Oregon.gov, including Grant County, Deschutes County, and Ashland. CWPPs help communities work together by allowing them to identify local priorities for community protection and resource management for protecting themselves from wildfire risk and managing their forested landscapes. Given that these plans are developed collaboratively and already address the issues of managing forested landscapes and wildfire risk, it is logical and appropriate to include smoke management associated with prescribed burning as part of these plans rather than develop a separate process and separate plan.

As currently proposed, development of these community response plans not only requires the involvement of the local health authorities, but states that the community response plan be coordinated through the local public health authority. We are concerned about placing an additional burden on the local public health authority which may not have sufficient funds or staff time to dedicate towards the plan and could potentially halt or delay the exemption process. A preferred alternative is to request involvement by the local public health authority but not require the plans be coordinated through these agencies.

Additionally, several communities such as Bend and Ashland already have community smoke response plans. How will these existing plans be considered? Can they simply be adopted? Do they need to be reviewed? Must they start over with a new process? The proposed language in the rule is not clear on how existing plans may be considered.

One of the required components of the community response plans stated in paragraph (3) is that these plans must provide actions to mitigate exposure to vulnerable populations and support citizens who may not have the means to take mitigation efforts. We are concerned that the requirement to support citizens who may not have the means to take mitigation efforts is an unreasonable burden given that prescribed burning itself is a means of reducing risk itself. While we share concerns about all people, including vulnerable populations, we do not support taking mitigation actions based upon smoke thresholds which are not scientifically justified, nor

do we consider the greater good being accomplished by the prescribed bums themselves. We suggest modifying the language in the rule such that the community response plans must consider (not provide) actions to mitigate exposure to vulnerable populations.

Another aspect of the exemption process is defining where the exemption could apply. The proposed language makes reference to the WUI as the requirement for lands, thus excluding all other areas. In eastern Oregon, smoke from prescribed burning near Sumter typically pools around Phillips Lake and then drains down the Powder River and into Baker City for a few hours. Would the exemption apply in such situations where the burning is conducted in one WUI area but smoke actually affects another SSRA 25 miles away?

Would the DEQ and ODF consider using other factors besides the WUI for determining where the exemption could apply? Could the community decide where they want to have the exemption apply? Would the ODF and DEQ consider using the areas identified as relatively high risk in the Quantitative Risk Assessment as suitable for an exemption? Recall that a collaborative group of individuals including those from the ODF met and agreed on other important things we want to protect from wildfire (referred to as highly valued resources and assets), including infrastructure, timber, and important habitat. The regional Quantitative Risk Assessment documented the process and results of this analysis. (See accompanying presentation titled The PNW Quantitative Wildfire Risk Assessment: Quick Overview & Applications, by R. Stratton.) We believe these areas also ought to be included in the determination of where the exemption ought to apply. Given the intention of the Cohesive Strategy to work across all lands to protect these highly valued resources and assets from the negative consequences of fire, the Forest Service and the BLM are prioritizing these areas for restoration and maintenance. As such, these are the locations in most need of an exemption to allow us maximum opportunity to restore and maintain these lands. We ask the ODF and DEQ to consider using the high priority areas in addition to the WUI to identify locations where the exemption is needed most.

Finally, we are concerned about the number of governing bodies which must approve a request for exemption and how long the exemption would last. The last sentence of paragraph (3) identifies five separate governing bodies which must approve a request for an exemption: the community's local governing body, County Board of Commissioners, ODF, DEQ, and Oregon Health Authority. It is not clear what criteria would be used to judge approval of a request for an exemption, and any one individual from any of these governmental bodies could deny the request based upon personal biases. We would like to see a simplified approach requiring a single approving body which has a clear set of criteria to evaluate the request for the exemption. Given the complexity of educating the local governing bodies and county commissioners, working through differences , and gaining consensus, it seems that the exemption ought to last a long period of time and not need to be repeated each and every year. We recommend that the process be simplified to a half-page exercise. Approval should also be simplified to approval of the local community as indicated by the inclusion in the CWPP.

629-048-0210 Best Burn Practices and Emission Reduction Techniques

Regarding paragraph (4b) we support the proposed change not allow the size of polyethylene covers to vary as necessary to promote efficient combustion of the piled fuels.

629-048-0230 Burn Procedures

A new paragraph (1b) has been added which states: "Resources needed and actions taken to reduce pre-burn fuel loading to minimize emissions." This sentence ought to be modified to be consistent with the objective of the SMP. Please modify the sentence to read as follows: "Resources needed and actions taken to reduce pre-burn fuel loading to minimize emissions consistent with the air quality objectives of the Federal Clean Air Act and the State of Oregon Clean Air Act Implementation Plan."

629-048-0310 Fees for Prescribed Burning

Currently, burn fees are paid at the time of registration for any prescribed burning on forestlands within the ODF protection boundary. The registration fee is valid for a three-year period; afterwards it expires. Another fee is charged at the first time fire is applied to a prescribed burn unit, regardless of actual accomplishment. Because of numerous challenges associated with getting burns accomplished after registration (such as unexpected whether, unfavorable smoke transport, community events, resource availability, etc.), not all acres are accomplished. Thus, there are commonly funds "left on the table." These funds have contributed to the excess funds in the ODF Smoke Management Program.

The Forest Service and BLM would like to only be subject to a single fee, respectively, based upon accomplishments. This would eliminate the overpayment of fees due to unburned units and allow for a system which directly ties fees to actual burning.

629-048-0400 Coordination with Other Regulatory Jurisdictions

One of the objectives of the SMP is to coordinate with other state smoke management programs. To facilitate meeting this objective, we suggest adding a new paragraph (5) to this section as follows: 'Once a year, ODE Smoke Management will solicit input from its communities and burners to understand if and how smoke from neighboring states is affecting Oregon communities and the ability of burners in Oregon to meet their objectives. Following this, the ODF will confer with each bordering state smoke management program to evaluate how prescribed burning in other States is impacting Oregon and communicate how prescribed burning in Oregon is impacting the bordering State. If issues are identified, the involved States and burners shall work on resolving issues and follow up to ensure solutions are working."

629-048-0450 Program Evaluation and Adaptive Management

Paragraph (4) of this section discussed consultation with the Smoke Management Advisory Committee (SMAC). The following observations and suggestions are offered to improve the function of the SMAC.

The Forest Service and Bureau of Land Management have participated as a members of the SMAC for many years. These meetings have focused primarily on a review of the fiscal status of the smoke management program, a detailed review of all smoke intrusions in the past six months, and some discussion on the use of polyethylene covers on piles. However, there has not been much, if any, discussion of the other purposes of the program including (l) providing opportunities for essential forestland burning, (2) coordination with other state smoke management programs, and (3) compliance with State and Federal air quality and visibility requirements. As such, the program evaluation seems biased toward focusing on smoke intrusions without a balanced discussion of all aspects of the program.

We recommend this section of the Smoke Management Program require the SMAC to review, evaluate, and make recommendations for adaptive management, if needed, for all six of the stated purposes of the SMP (i.e., 629-048-0010 paragraph 4a-f) on an annual basis. Each purpose should have a metric against which it can be determined if the SMP is meeting the stated purpose. For example, the SMAC currently does not define the term opportunity for essential forestland burning “and how this is measured and evaluated. Defining this term and providing a metric for program evaluation is needed to restore a balanced approach for determining overall program effectiveness.

The SMAC should also review and make suggestions to improve the annual ODF Smoke Management Report prior to its release to the public. In addition to the items listed in the annual report, it would be helpful if the ODE, along with the SMAC, would document research needed to improve smoke management in the State.

Jamie Connell, State Director Oregon/Washington USDI Bureau of Land Management

Dianne Guidry, Acting Regional Forester, Region 6, USDA Forest Service

Response #146

Regarding the comments on:

OAR 629-048-0180

No changes were made to the proposed rules based on your comments. DEQ agrees that existing planning efforts, like the Wildfire Protection Plans harmonize well with the purpose and intent of the proposed Community Response Plan. The proposed rule language does not prohibit a community from utilizing existing planning efforts in the development of their Community Response Plan.

OAR 629-048-0230,

No changes were made to the proposed rules based on your comments. The proposed rules incorporate changes to program objectives and DEQ does not believe that the proposed change is necessary given the overarching change to program objectives portion of the rules.

629-048-0005 Definitions:

Smoke Intrusion: not supportive of the 1-hour threshold

Smoke Incident: feels the term smoke incident is counter-productive and has too much monitoring, documenting, and reporting elements.

Smoke incidents are important to be aware that they exist as they are impacts to communities, and at what level. Yes they can be used to help establish an SSRA as part of documenting smoke impacts from prescribed fires. Would you want there to be only impacts above the 26 ug/m3 threshold to be counted as an issue for the residents? What about the residents who are impacted at levels much less than 26 ug/m3, do their concerns not count? The Department is interested in knowing where, when, and how much smoke is impacting communities, whether above and intrusion level or not, and so few prescribed burns result in impacts to communities (well less than 1% of all units burned) this does not appear to be a burdensome issue.

We have added a definition for Vulnerable Populations.

629-048-0020 Necessity of Prescribed Burning

We added one sentence to the language in this section.

629-048-0110 Characterization and Response to Smoke Incidents, Intrusions, and NAAQS Exceedances

The procedures are found in the Directive and the method is still a viable solution. See ODF response to comments.

629-048-0120 Air Quality Maintenance Objectives

We removed the term “play or exercise”; we added the language “alter or suspend lighting”.

629-048-0130 Visibility Objectives

Thank you for the suggestions however we will keep the existing language.

629-048-0137 SPZ (Special Protection Zone) Contingency Plan Requirements

The agency feels smoke from prescribed fire can be managed in a positive manner without causing a NAAQS exceedance.

We removed this greater restriction for the Klamath Falls area as it was a legacy item from an issue years ago.

629-048-0180 Community Response Plan and Exemption Request

The Community Wildfire Protection Plans can certainly have a role in the Community Response Plans referenced here, yet this would need to be crafted as part of the agreement with the community leaders, the local public health authority and the land manager. There likely are very good aspects of the plans which can be used for this purpose. Or the prescribed burning Community Response Plan can be incorporated into the Wildfire Protection Plan as you suggest.

The local public health authority is a key partner in the Community Response Plans and needs to have a main role in the creation and implementation of the plan. We acknowledge resources will have to be worked out but yet it is not at the exclusion of the local health authorities from their key role in the process.

We have added clarifying language to the rule concerning the Community Response Plans and the elements they contain and reporting of annual activities plus a compliance section.

Comment #147

Clean air is vital to the health of Oregonians. Fire smoke and fine particulate matter can travel into the deep parts of the lungs and into the blood stream. Contribute to or exacerbate asthma, COPD and heart disease. Very harmful to small children. Acute smoke can irritate the lungs and make breathing harder for people with COPD. When acute smoke exposure interferes with lung function, the heart works harder to pump blood and oxygen to the body. One if five adults in Oregon have health issues related to breathing. Support 1-hr and 24-hr thresholds. Recommends a permit process rather than an exemption process. OHA is ready to support implementation of the revised rules consistent with: Meaningful community engagement - with advanced planning and execution of health risk communication; technical assistance and clear guidance for local agencies and organizations to create and implement community smoke mitigation plans; careful evaluation to assess over time whether allowing increased smoke intrusions outside wildfire season results in reduced exposure of sensitive populations during wildfire season.

Lilian Shirley, Director, Public Health Division, OHA

Response #147

Thank you for your comment.

Comment #148

Dear Oregon Department of Forestry and Department of Environmental Quality:

Jackson County appreciates the opportunity to provide comments on the Oregon Department of Forestry's proposed amendments to Chapter 629 of the Oregon Administrative Rules constituting the Oregon Smoke Management rules. Following many months of unhealthy hazardous air quality, Jackson County's Board of Commissioners feels compelled to comment on the proposed rule-making Of the Smoke Management Plan. The hazardous air quality that Our County's citizens have had to live in year after year has become the unacceptable new "normal."

It is the duty Of the County Commissioners to protect the health safety, and welfare of our citizens. Their health, safety, and welfare is being threatened by the consistent misuse Of the Current fire management policies Of the Federal agencies. Wildfire smoke is an ever repeating condition to our summer air, and prescribed fire policies need to be addressed in conjunction with air quality and smoke management.

The Federal Wildland Fire policy (Policy) presented by the Oregon Department Of Environmental Quality (DEQ) representative at the public hearing in Medford on August 29, 2018, depicts that prescribed fire management is a documented allowable use during wildfires - in and out of fire season. This policy was electronically emailed on September 5, 2018, by Commissioner Colleen Roberts to Mr. Michael Orman, Air Quality Planning Manager for Oregon DEQ, to review and illustrates our concern that prescribed fire during fire season and during a naturally caused wildfire event adversely and negatively affects the air quality. Smoke management must be considered for prescribed fires in your rule-making, in light of the policies presented. It is with full knowledge of these existing policies that true smoke management rules for air quality concerns can and should be made.

We ask that the proposed changes to the Oregon Smoke Management rules be reconsidered to include a review of this Policy, and coordination With Jackson County by the same of pertinent information and documentation Of the Federal Wildland Fire policy (https://www.forestsandrangelands.gov/documents/strategyfoundational/1995fedwildlandfirepolicyprogramreport.pdf).

A careful study will reach the same inescapable conclusion that we, as the Jackson County Board of Commissioners, have reached. The allowance of the use of wrongful policy will present a continued threat to the health, safety, and welfare to our citizens due to the increased presence of smoke. Ultimately, prescribed fire management should not be utilized any time after the State Fire Marshall declares the official Start of fire season, no matter the source of the ignition. The fire must be put out. We hope that this invaluable information will help in a coordinated effort to better fulfill our shared obligation and duty to fully protect our citizens from the present harm from wildfire smoke that our region has continued to experience on a daily basis.

Jackson County Board of Commissioners

Rick Dyer, Chair

Bob Strosser, Commissioner

Colleen Roberts, Commissioner

Response #148

Thank you for your comment. While this topic is outside the scope of this rulemaking, DEQ will recommend the topic be reviewed by the Smoke Management Advisory Committee (SMAC). The SMAC represents various Smoke Management Program stakeholders, including Federal Land Managers.

Comment #149

The Coalition of Local Health Officials (CLHO) and Local Public Health Authorities across the state have reviewed the proposed rules and have the following comments. These comments in no way endorse the underlying changes to the Administrative Rules but are technical in nature.

Here are the CLHO suggested changes:

1. Change "County Health Department" to "Local Public Health Authority" to capture the health district and ensure information gets to the right people.
2. A Community Response Plan is required for consideration of the request for an exemption to the one-hour smoke intrusion rule. Once a community or city or county decides to seek an exemption to the rule, they will include their Local Public Health Authority in coordinating the development of a Community Response Plan.
3. Clarify the process in the Oregon Administrative Rule for applying for an exception to the one- hour smoke intrusion rule that is separate from just having a "Community Response Plan." The process is not clear in the new language.

Please also consider including language in this plan to align with other public health emergency planning activities that includes community and stakeholder engagement. This alignment and flexibility will allow for better coordination amongst stakeholders that are already working together.

Morgan Cowling, MPA, Coalition of Local Health Officials

Response #149

Thank you for your comment. The proposed rule language was revised based on your comment. The term County Health Department was revised to Local Public Health Authority. Additional clarification was also provided for the 1-hour average intrusion threshold waiver process.

Comment #150

Thank you for reviewing extensive public comments on the proposed smoke management rules. In the best of all worlds we would be able to have both healthy fire resilient forests and no smoke in the air. Unfortunately, that doesn't appear to be one of the options that nature has placed before us. You are in the unenviable position of having to choose the balance. Regardless of where you come down, there will be people unhappy with the result.

With that in mind, I would like to offer some perspective I've gained from the process of helping to draft the 1-hour exemption language that will be at the heart of the controversy. I got roped into this project as a result of my legal background and my participation with several collaborative across eastern Oregon. I've spoken with a wide variety of people on the matter ranging from environmental advocates concerned about wildlife, to Forest Service personnel, to public and private burn bosses and fire fighters, to rural county commissioners, to angry members of the public who have felt the first-hand effects of prescribed fire smoke in their homes to west side advocates against the exemption. And I bring my own first-hand experiences of living in Bend, and breathing hazardous air for weeks in a row in 2017, and seeing the impact of the cancelled Sisters Folk Festival, and countless small businesses hurt. I also have roots in John Day, and I've heard the stories first hand from people who lost their homes in the Canyon Creek fire.

A little less than a week ago Gregory McClarren told me the tale of the establishment of the Clean Air Act, and what it took for Oregon to get on board with aggressive implementation. As I understand from him, the Federal Act was apparently established when large cities, especially in the east, started seeing smog so dense that it was clearly impacting health, and even visibility. Oregon got on board when field burning in the Willamette Valley put so much smoke in the air that there was a huge multi-car pile-up on I-5 as a result of low visibility. These consciousness shifting events changed the political will.

Consciousness shifting events have changed the political will about prescribed fire in eastern Oregon. The Canyon Creek fire, the Milli Fire, the multiple days of hazardous air have changed what we're willing to put up with. In rural eastern Oregon, almost everyone knows someone who has either lost a home, suffered a serious business loss, or been a wildland firefighter on the front lines. The science is clear that in our dry ponderosa pine forests of eastern Oregon thinning plus prescribed fire is the most reliable way to make the forest more resilient to uncharacteristically intense wildfire. But I've observed in our collaborative settings that the science doesn't win hearts and minds like the stories from the firefighters. They sit with us at the bar, or sometimes at the collaborative table, and talk about how they were able to hold the fire when it got to the areas that had been treated by thinning and prescribed fire. Sometimes they even take us out to their prescribed fires, or places where they used existing treatments to hold the line.

They tell the stories, and we listen, sometimes aghast at what they've faced.

This has changed the political will in eastern Oregon. None of us like smoke. It hurts our lungs too. But we're ready to put up with more of it if it will help reduce the uncharacteristic severity of the wildfires we've seen recently.

Therefore, I request that you establish a version of the new rule that includes a very clear pathway to exemption from the 1-hour threshold for intrusion. The political will is different in western Oregon. That's understandable. They aren't experiencing the same problems we are. That's why an exemption process, for communities that want it, is the perfect solution. The process should not be burdensome, and the goals should be clear. The process should require no more than drafting a plan using a collaborative process that includes local voices, and an application by the local governing body. The local governing body is in a far better place to determine whether their citizenry is comfortable with the smoke/forest health trade-off than anyone else.

The goals should be 1) to ensure clear communication between burners and communities they might impact; and 2) that there is a clear plan to alert vulnerable populations. The public alert requirements should not be more stringent than other established State protocols and recommendations for short duration smoke episodes. Data show that less than 1% of the air quality events in Oregon are due to prescribed fire smoke. See Table. It would make no sense to require more stringent alert requirements for something that is such a small percent of the problem.

Further, prescribed fire is the only source of smoke whose presence has a strong likelihood of reducing wildfire, the most common cause of very unhealthy and hazardous smoke levels. We should be encouraging more low-intensity prescribed fire which will help reduce high-intensity wildfire.

In response to this argument I've been told that prescribed fire is not the silver bullet. That loosening the regulations on prescribed fire smoke won't solve our forest health, and Wildland Urban Interface safety issues. It's been explained to me that we also need to improve our land use laws and stop allowing people to build isolated, unprotected homes in the forest. I've also heard that the barriers to prescribed fire include many other things besides the regulation, such a lack of funding and agency culture, and that we need to work on those as well.

While this is indeed wise counsel – I absolutely agree this change in regulation won't solve all our forest health or fire problems – it is also not a reason to reject the exemption process. Solving the forest health and wildfire resiliency problem is going to take change on many fronts. This is one

of them. Getting this done doesn't mean we're finished.

I have also heard the argument that the rules are not "punitive" and thus it doesn't really matter if there is a 1-hour threshold because no one is going to get in trouble for surpassing it anyway. This strikes me as unrealistic, and not good public policy. In the vast majority of cases, our public servants are doing their level best to carry out the will of the people that pay their salaries, and trust them with fire. I've spoken with the burn bosses who have been on those phone calls. In some cases, they understand that the rules aren't officially punitive, but rules impact actions on the ground. Most burn bosses got that job because they can be relied upon to do what is expected of them – even when the going gets tough and even if they don't agree with the politics. If they cause intrusion after intrusion it reflects badly on them, even if they are successful in never exceeding NAAQS. If they are in a community that has chosen the exemption, they know that the political will is different there, and will respond accordingly.

The final call about how to balance public values around forest health and ambient air quality shouldn't be made by burn bosses on the front lines anyway. By the time the fire is lit, or even by the time the crew is ready to go in the morning, there should be a clear set of goals they're trying to accomplish. The decision about whether a community wants to allow exceedances of the 1-hour threshold in exchange for forest health & safety should have been made long ago. It should be made by the community, not the burn boss on the day of the fire.

I would also like to call your attention to one issue with the current exemption draft language that I believe remains unresolved. If a community gets an exemption, who gets the green light to burn more? Everyone that might impact that community? Or should the community get to choose who they want to give the additional flexibility to? I'm not sure this needs to be resolved in this round. In most communities that I've communicated with there is only one burner – the local Forest Service – that causes most of the intrusions. But the issue was raised by several rural counties, and I think it should be considered.

Conclusion

I don't envy you the tough decision ahead. This is a public-values balancing act. While I see the value of a single statewide standard, I don't think that's an appropriate solution at this point. Events in eastern Oregon have changed hearts and minds east of the Cascades in ways that the westside doesn't seem to fully grasp at this point. It's not a left/right or urban/rural divide. It's the fact that our local ecosystems are different on the dry side, and they produce different effects on our communities. Our dry pine ecosystems evolved with frequent low-intensity fire. Suppressing fire only builds up brush and small flammable tress ("fuels" in firefighter speak) which makes them more vulnerable to uncharacteristically intense fire. This isn't the case west of the divide. So, it's not a surprise that they see things differently. Accordingly, we should have different rules. The exemption process is the right way to do that right now. As an opt-in program, requiring application by the local governing body, it assures that those who are in the best position to understand local public values make the call.

Thank you for your consideration,

Pam Hardy, Western Environmental Law Center

Response #150

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization.

Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implement mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA

Comment #151

On behalf of the Harney County Restoration Collaborative, we thank you for the opportunity to provide comments to the Oregon Department of Forestry (ODF) and Oregon Department of Environmental Quality (DEQ) concerning the proposed rule changes to Oregon's Smoke Management Plan. This summers' fire season in Oregon and across the West is yet another indication that wildfires are becoming larger, more frequent, and more intense. In Central Oregon, we and our partners are taking proactive steps to reduce the risk of such extreme wildfires, including the strategic use of prescribed fire in the forests immediately around our communities.

To continue this work, we need a holistic and forward-thinking smoke management policy in Oregon. We appreciate the work by ODF and DEQ staff in leading the smoke management plan review and we applaud the effort to align Oregon's smoke management rules with the federal Clean Air Act 24-hour National Ambient Air Quality Standards (NAAQs). We believe that using the NAAQS (including the proposed buffer of 75% of the NAAQS) to define smoke intrusions strikes an appropriate balance by addressing our shared interest in protecting public health, minimizing smoke entering communities, and allowing critical prescribed burning to occur as we work together to confront the very real wildfire threat facing our communities. For this reason, we have significant concerns with the 1-hour threshold. Data shows that the 1- hour threshold imposes a significant limitation on the very prescribed burning priority areas that are most critical to our community wildfire protection efforts here in Harney County.

Consequently, our support for smoke management rule package is contingent upon the inclusion of the provision providing communities a clear, simple, and attainable process to obtain an exemption from the 1-hour smoke threshold when they have implemented a smoke communication and mitigation plan.

Thank you for the opportunity to provide comment on the proposed rules. The fire-prone forests of eastern Oregon will burn sooner or later. Our choice is when and how they will burn: in a controlled way during carefully planned and implemented prescribed fire or during out-of-control wildfires. In light of the science on this topic, we believe that the short-term impacts of prescribed fire will be far less than the impacts of wildfire in the long-run and we urge you to adopt the proposed rules so we can do what is needed to protect our forests, communities, and firefighters now and in the future.

If you have any questions, or we can be of any assistance, please contact our administrative coordinator, Ben Cate at the High Desert Partnership. ben@highdesertpartnership.org

Respectfully, Harney County Restoration Collaborative

Response #151

Thank you for your comment. Guiding legislation for the Smoke Management Program directs

ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implement mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA

Comment #152

The present SMP proposed changes to Oregon's SMP will not reduce Wildfire Impacts and will cause adverse effects on public health and welfare in Oregon especially in tourist reliant economies.

My wife, young child and I moved to Ashland 32 years ago. We loved this area except for the PM air pollution. As an adjunct professor of chemistry at what is now SOU, I changed my research direction from the cancer research I had been doing while on the faculty at UC Berkeley, to work on PM air pollution with a greater focus on the Medford-Ashland AQMA.

At that time Medford PM was 200% of the EPA daily PM standard and 150% of the annual average PM standard. Initially residential woodstoves were thought to be the largest contributor of PM. My analysis indicated that emissions from the wood products industry were 16 times greater than emissions from residential woodstoves . The large hog fired industrial boilers could be considered "industrial woodstoves'. Some of the most stringent industrial pollution controls were needed to bring the Medford - Ashland area in compliance with public health standards. The peak of PM pollution corresponded with wood products output with a 0.915 R squared value. There was no correlation with woodstove use, transportation, or other source categories tested.

Special consideration in the SMP should be applied to the Medford-Ashland areas with its high stagnation potential as well as other tourist-reliant economies.

The annual average PM is the most important in terms of public health and welfare. EPA also has a daily standard. There is very little documentation of the validity of the one-hour standard, which is the metric used in this proposed SMP.

I was a representative on 2017-2018 Smoke Management Program Review Committee as well as one the prior one. In the prior one I pointed out that the intrusion methodology was not a valid measure of PM emissions from prescribed burning contributions to the PM Smoke Sensitive Receptor Area (SSRA) Intrusions.

This SMP is limited to smoke impacts at ground levels. This provides to panoramic views.

The rules seek to maximize opportunities for reducing excessive forest and range fuels, mostly by burning, while minimizing impacts on the public from the smoke this produces. Protection of public health and welfare is virtually ignored.

There aren't financial incentives to use mechanical treatments or other alternatives to burning. Heath costs incurred by the affected population:

Increased burning done outside of the wildfire season means there will be more smoke in the initial years of application. The SMP will not have public acceptance after it is implemented and will not achieve its objectives.

Environmental Justice Issues: The poor and can't afford to seek shelter to avoid increased

smoke levels.

The EPA uses color codes to easily identify the amount of Air Pollution, e.g. green for good, yellow for moderate or orange, which indicates unhealthy to Sensitive Groups. This category includes adults with asthma, heart disease, COPD, children from age 0-14, and adults age 65 and older. That is 48% of all Oregonians.

PROBLEMS WITH CURRENT SMP

PROBLEMS WITH PROPOSED SMP

INTRUSIONS

REQUEST FOR EXTENSION

DEFINE PM

Tourist-Reliant Economy

There are special rules for this area because of its stagnation potential.

Intrusion definition uses criteria that limits an evaluation of only a small fraction of all prescribed burning done in Oregon. Even those burns to which it applies it only evaluates emission over a short period after ignition. The only meaningful measure of the total contribution of PM to any SSRA is over the entire duration of emissions measured at a receptor. For example for a pile burn at the time of ignition if the forecast is accurate will blow away from the SSRA. Later in the day a smoldering phase begins.

Emissions will go downwind or more likely will gravitate to mountain valleys. Such emission will gradually get to a SSRA monitor. The intrusion criteria will not be met and such emissions will not be recorded. This is a frequent occurrences of such emissions not being detected by the PM monitoring site in the Medford-Ashland area after a delay in them captured by a compliance monitor. Additional the smoldering phase can last for, days, weeks and longer from the time of ignition.

*The present SMP only measures short term visual smoke reported to a small fraction visibility measure for a limited period. This fails to measure total emissions from that burn from its contribution to the amount of PM emitted. This eventually is detected at a PM monitoring device, such as a monitor located at a specific SSRA site such as Medford. Its contribution to carbon fraction that come from a wide variety of source categories such as woodstoves, industrial emission, open burning and a other sources determined by chemical analysis of the contents of a receptor monitor. The net effect is an inaccurate Emission Inventory (EI) needed to evaluate the source contribution from different source categories collected at the receptor site.

An SMP should not increase smoke pollution at the expense of protecting air quality and visibility as it does in this proposal.

There are inadequate or no parameters to determine compliance

Special exemptions that was rejected by the SMP Review committee should not have been adopted by the BOD. In turn the EQC merely accepted an update on an individual basis as should have been an agenda item at the next regularly scheduled to make it a more transparent process and that would allow more public input before going out the public hearings in late August. The rush to ramrod a major change from what EQC had approved earlier.

EPA should not approve the proposed SMP that require SIP revision that is required.

Heat, low fuel moisture, and wind are drivers for catastrophic fires. Except for clearing a

defensible space around dwellings, fuels buildup due to long periods of when prompt fire suppression.

A well-funded public education campaign by proponents made misleading and/or false claims. For example Smoke from prescribed fire and wildfires are not different as purported by the proponents of this SMP.

Ground level only application of SMP. This will adversely affect visibility and will not protect panoramic views.*

*Clean Air Act (CAA) was first signed into law by President Nixon. The 1990 Amendments signed into law by President George HW Bush are still in effect.

* Its main objective is to protect human health and welfare from air pollutants. Public welfare is to protect the quality of life which includes improving visibility not decreasing it as would occur with the proposed SMP

The Clean Air Act requires a periodic review of it air quality public health standards. The PM standard has been changed three times--each time they had to become more stringent to protect the public health and welfare as determined by more scientific and medical studies/.

Human mortality and morbidity, including acute myocardial infarctions and chronic bronchitis; and improving the quality of ecological resources and other aspects of the environment, the largest component of which is improved visibility has a linear relationship with PM levels human mortality that extrapolates through zero. Thus, there are no safe levels, but lower is healthier.

Benefits and Costs of the Clean Air Act 1990-2020, the Second Prospective Study Healthier Living

Emissions control programs that reduce air pollution from smokestacks and tailpipes provide enormous air quality and health benefits today, and the benefits will grow over time as programs take their full effect.

In 2020, the Clean Air Act Amendments will prevent over 230,000 early deaths. Most of the economic benefits (about 85 percent) are attributable to reductions in premature mortality associated with reductions in ambient PM.

The 1990 Clean Air Act Amendments programs are projected to result in a net improvement in U.S. economic growth and the economic welfare of American households.

Central benefits estimates exceeds costs by a factor of more than 30 to one, and the high benefits estimate exceeds costs by 90 times. Even the low benefits estimate exceeds costs by about three to one.

Studies

In 1972 Dr.Holzworth a NOAA meteorologist working under contract for the EPA using Ventilation Index technology measured the air stagnation potential by month at all National Weather Service (NWS) sites in the continental U.S. He determined that Medford had the highest potential for prolonged periods of late fall and winter stagnation of all NWS sites.

The methods he used are still widely used today using twice daily air balloon soundings to measure air dispersal in the mixing layer. The NWS and ODF use this technology. ODF also uses other factors it in making its forecasts for prescribed burning in Oregon. The combination of complex terrain and the meteorology in an area with low annual precipitation makes southern Oregon are things we can’t control. Special protective measures are needed in this SMP. It bears repeating that the Medford-Ashland area is a tourist reliant economy.

The net improvement in economic welfare is projected to occur because cleaner air leads to better health and productivity for American works as well as savings on medical expenses for air pollution-related health problems. The beneficial economic effects of these two improvements alone

are projected to more than offset the expenditures for pollution control.

Prescribed Burning

Two forms are broadcast burning and pile burning. For both only the date and time of ignition is recorded.

Relevant history. On October 8, 1871, the Great Chicago Fire in Illinois, the Peshtigo Fire in Wisconsin and Michigan and three other major fires in Michigan took place. This was prior to the NWS but it appears that all of these places had similar weather. They were in drought, had abnormally high temperatures and were impacted by a major weather front with high winds passing through the area where multiple major fires occurred on the same day.

Since 1925 National Fire Prevention Week takes place during the week of October 9. It is the longest public health observance in our country, created in commemoration of the Great Chicago Fire, which caused devastating damage. This horrific conflagration killed more than 250 people, left 100,000 homeless, destroyed more than 17,400 structures, and burned more than 2,000 acres of land.

The Peshtigo Fire remains the deadliest wildfire in American history. The estimated fatalities range from 1,500 to 2,500. The burned area was 1,200,000 acres in WI and MI. In addition there were major fires in Manistee, Holland, and Port Huron in MI.

My mother was born on her grandparent's farm in Door County, Wisconsin. Those grandparents and her great grandparents lost everything but their lives. homes, barns, livestock, stored food and other supplies were destroyed.

The SMP has a misguided focus. Eighty percent of wildfires in Oregon are human caused. Yet there is nothing in this SMP to attempt to reduce this largest source category.

Many items in the SMP proposal are too vague and open ended to enforceable. A short term permit system should be required.

There are many other problems with this SMP to detail here. This process is moving too fast to be properly be vetted before moving forward on the proposed timetable.

Other Items**

Thank you for your consideration of these comments.

Bob Palzer

Response #152

Thank you for your comments. There may be times with an increase in smoke in a given area, yet it should be for short durations and limited impact as the burns should be designed to keep smoke levels from exceeding the air quality standard, if not reasonably below the standard. If there is a community education and outreach plan and program developed for an area, such as the Ashland area, efforts will be made to reach out to as many people as possible with information about possible smoke in advance of prescribed burns. Some homeless populations will be missed in this effort, it is true, yet it is nearly impossible to inform this population about the goings on in the area unless they wish to and seek information.

Smoke from prescribed fire whether current or smoldering into the night should be picked up by the local monitor (if the smoke heads that way) and count as an intrusion or an incident. Even a day later this smoke counts. The SMP also has provisions to protect visibility from Class I areas, but not visibility to such Class I areas.

The purpose of the SMP is in part to return fire to the landscape and fire as part of the forest ecology.

Prescribed burns will help reduce the threat of wildfire to many communities however it may take years if not decades to fully achieve such levels of protection.

The exemption process is designed to have a termination if there are an unacceptable amount of intrusions in a 3 year period (3 or more in 5 years above the 24-hr threshold) and 2 NAAQS exceedances in that time. Perhaps this is not punitive enough but time will tell and it can be up for review in the next SMP review cycle.

Comment #153

On behalf of the Confederated Tribes of Warm Springs, we would like to voice our support for the increased use of safe and effective prescribed burning in Central Oregon's forests. The use of fire as a tool for sustainable food production and maintenance of healthy forests for wildlife and clean water has been demonstrated for centuries by native people. "the people of Warm Springs have a thorough understanding of the ecological connection between fire and healthy, productive forests. On Warm Springs' lands fire was used in a controlled manner in root fields and following fall berry harvest to maintain open forests and sustain yields of huckleberries while also providing important habitat for wildlife species.

We understand there is a need today to increase the use of controlled fire for the health and resilience of our current forested landscape. We know that in order to increase the use of prescribed fire meaningful reforms to Oregon's smoke management rules and we appreciate the work Oregon Department of Forestry and Oregon Department of Environmental Quality staff in leading smoke management plan review.

And while we recognize that increased prescribed fire may lead to an increase in short-term smoke impacts in our communities, we also recognize the need to fight wildfires before they happen. It's important to remember that there is no smoke-free option to living in Central Oregon. Ultimately, support a more holistic solution to prescribed fire and smoke management than what is provided by state policy. We believe that the short-term impacts of prescribed fire will be far than the impacts of wildfire and will lead to the long-term health and viability of our forests.

Robert Brunoe, Natural Resources General Manager, Confederated Tribes of Warm Springs

Response #153

Thank you for your comment.

Comment #154

Thank you for this opportunity to provide comments concerning the proposed changes to Oregon's Smoke Management Plan. Both as a longtime (but now former) member Of the Oregon Watershed Enhancement Board (OWEB), as well as a resident of Ashland's forest interface, I have been quite interested in the effective use of prescribed burns to reduce the risk and deleterious effects of catastrophic wildfires.

In both of these roles, I have been directly involved in the funding and implementation Of the Ashland Forest Resiliency Stewardship Project (AFR). Moreover, as an immediate neighbor of AFR's project area, I have often experienced the direct effects of both the thinning and prescribed burning aspects of AFR. AFR has demonstrated that both of these elements can be successfully implemented, with overwhelming neighborhood and community support.

I believe there is scientific Consensus that the only way to begin to reduce the risks of catastrophic wildfire in our forests, particularly the so-called "dry side" forests of eastern and southwestern Oregon is to couple effective thinning with well-executed prescribed burning. Consequently, I would be very concerned about anything in the proposed rule changes that might prevent the continued and expanded use of prescribed burning. Specifically, I strongly support the comments submitted by The Nature Conservancy, one of the primary AFR partners, advocating for the inclusion in the rules of an opportunity for communities to receive an exemption from the proposed one-hour smoke threshold. AFR has certainly demonstrated that such as exemption can be effectively applied.

Ironically, having experienced the worst summer smoke of my lifetime in southern Oregon, I am absolutely willing to accept the occasional effects of smoke associated with prescribed burning. I urge that Oregon's Smoke Management Plan be amended in a manner that does not unnecessarily hinder the use of this critical tool.

Daniel Thorndike, General Counsel, MedFab

Response #154

Thank you for your comment.

Comment #155

On behalf of the Crook County Court, we would like to take this opportunity to provide comments to the Oregon Department of Forestry (ODF) and Oregon Department of Environmental Quality (DEQ) concerning the proposed rule changes to Oregon's Smoke Management Plan. This summer’s fire season in Oregon and across the West is yet another indication that wildfires are becoming larger, more frequent, and more intense. In and around the Ochoco National Forest, the County and its community partners are taking proactive steps to reduce the risk of such extreme wildfires, including the strategic use of prescribed fire in the forests immediately around our communities. To continue this work, we need a holistic and forward-thinking smoke management policy in Oregon. We appreciate the work by ODF and DEQ staff in leading the smoke management plan review and we applaud the effort to align Oregon's smoke management rules with the federal Clean Air Act 24-hour National Ambient Air Quality Standards (NAAQs). We believe that using the N AAQS (including the proposed buffer Of 75 percent Of the NAAQS) define smoke intrusions strikes an appropriate balance by addressing our shared interest in protecting public health, minimizing smoke entering communities, and allowing critical prescribed burning to occur as we work together to confront the very real wildfire threat facing our communities. For this reason, we have significant concerns with the 1-hour threshold, which runs counter to our interest in a smoke management policy that accounts for the short and long- term consequences of wildfire Data shows that the 1-hour threshold would impose a significant limitation on the very prescribed burning priority areas that are most critical to our community wildfire protection efforts in Crook County.

Consequently, our support for a smoke management rule package is contingent upon the inclusion of the provision providing communities a clear, simple, and attainable process to obtain an exemption from the 1-hour smoke threshold when they have implemented a smoke communication and mitigation plan.

Thank you for the opportunity to provide comment on the proposed rules. The fire- adapted forests of the Ochoco will burn sooner or later. Our choice is when and how they will burn: in a controlled way during carefully planned and implemented prescribed fire or during out-of-control wildfires. In light of the science on this topic, we believe that the short-term impacts of prescribed fire will be far less than the impacts of wildfire in the long-run and we urge you to adopt the proposed rules so we can do what is needed protect our forests, communities, and

firefighters now and in the future.

Crook County Court

Seth Crawford, County Judge

Jerry Brummer, County Commissioner

Brian Barney, County Commissioner

Response #155

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implement mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA

Comment #156

On behalf Of the Central Oregon Visitors Association, we thank you for the opportunity to provide comments to the Oregon Department of Forestry (OOF) and Oregon Department of Environmental quality (DEQ concerning the proposed rule changes to Oregon's Smoke Management Plan.

The wildfire season of 2017 burned million acres and was notable for its effects on some of the state's most significant visitor destination areas. To serve the communities and businesses impacted by the fires, and to understand the economic consequences of these fires on the state's travel and tourism industry. Travel Oregon. worked with Dean Runyan Associates and Destination Analysts to conduct a study in March 2018, where they found an estimated SSI-I million in lost revenue (visitor spending) during 2017, $19 million of which impacted Central Oregon communities, Businesses and organizations reported that the most significant problems were: smoke (90 percent), customer perceptions regarding fire-related discomfort or danger (75 percent), road closures (60 percent), all of which led to a decline in visitation and spending/revenue.

In Central Oregon, our land management partners are taking proactive Steps to reduce the risk of such extreme Wildfires, including the strategic use of prescribed fire in the forests immediately around our communities. To continue this work we need a holistic and forward-thinking smoke management policy in Oregon.

We have significant concerns with the 1-hour threshold, which runs counter to our interest in a smoke management policy that accounts for the short and long-term consequences Of Wildfire. Data shows that the I-hour threshold would impose a significant limitation on the very prescribed burning priority areas that are most critical to our community wildfire protection efforts here in Central Oregon. Consequently, our support for the smoke management rule package is contingent upon the inclusion of the provision to provide communities a clear, simple, and attainable process to obtain an exemption from the l- hour smoke threshold when they have implemented a smoke communication and mitigation plan.

Julia Theisen, Central Oregon Visitors Association

Response #156

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implement mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA

Comment #157

On behalf Of the Central Oregon Trail Alliance (COTA), we thank you for the opportunity to provide comments concerning the proposed rule changes to Oregon's Smoke Management Plan. COTA's main focus is to build and maintain trails throughout Central Oregon. Much Of this takes place on National Forest land Being proactive to fight against wildfires is very important to our organization: wildfires put our volunteers and members at risk and can negatively affect the trails we annually spend thousands Of hours working on and years enjoying. Strategic use of prescribed fire in the forests is the best way to reduce the risk of such extreme wildfires, including the areas COVA builds and maintains trail.

We appreciate the work by ODF and DEQ staff in leading the smoke management plan review and we applaud the effort to align Oregon's smoke management rules with the federal Clean Air Act 24—hour National Ambient Air Quality Standards (NAAQs). We believe that using the NAAQS (including the proposed buffer Of 75% Of the NAAQS) to define smoke intrusions strikes an appropriate balance by our shared interest in protecting public health, minimizing smoke entering communities and allowing critical prescribed burning to occur as we work together to confront the very real wildfire threat facing our communities.

For this reason, we have significant concerns with the l-hour threshold, which runs counter to our interest in a smoke management policy that accounts for the short and long-term consequences of wildfire. Data shows that the 1-hour threshold would impose a significant limitation on the very prescribed burning priority areas that are most critical to Our community wildfire protection efforts here in Central Oregon.

Consequently, our support for smoke management rule package is contingent upon the inclusion of the provision providing communities a Clear, simple, and attainable process to obtain an exemption from the 1 -hour smoke threshold when they have implemented a smoke communication and mitigation plan.

Thank you for the opportunity to provide comment on the proposed rules.

Bruce Schroeder, Central Oregon Trail Alliance

Response #157

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implement mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA

Comment #158

The Sisters Area Chamber of Commerce writes in strong support for the adoption of the national Environmental Protection Agency's 24 hour air quality standards.

We stand in opposition to the addition of a one hour intrusion standard that has no scientific basis and has the almost certain potential to reduce the amount of prescribed fire that can be implemented to reduce the threat of wildfires in the wildland urban interface, including to our infrastructure, residents, visitors and emergency services personnel.

As you may know, Sisters economic engine is tourism and we strongly encourage the committee to consider the Oregon Smoke Management Plan to follow federal standards under the Clean Air Act and the 24-hour National Ambient Air Quality Standards.

Thank you for all you are doing on the proposed rule changes and for the opportunity to comment on those changes.

If you have any questions please feel free to contact me at my Sisters, Oregon office.

Judy Trego, Sisters Area Chamber of Commerce.

Response #158

Thank you for your comment.

Comment #159

My name is Frances Preston, I live in Prairie City, in the County of Grant. I understand you are taking public comment for rules.

I write you today as a concerned citizen.

As you are all very much aware in Grant County Oregon we have been having a lot of "smoke" first the Canyon Creek fire then prescribed burning.

Increased prescribed fire will increase negative health impacts due to inhalation. We have a lot of vulnerable residents (elderly, children, newborns, cancer, COPD, and anyone who spends time outdoors). As you are aware this leads to serious respiratory and heart health conditions. Rural demographic of an increasingly older population base continues, the vulnerability of rural communities is increasing.

We need more science on the impacts of smoke.

EPA has not established national ambient air quality standards (NAAQS) and there are no scientifically peer review and acceptable thresholds for health effects to occur at averaging periods for any concentrations of smoke less than the 24-hour concentrations. Oregon DEQ believes that the empirically- based and dated NAAQS and the tiered Air Quality Index for public health concerns are not protective enough. I would agree. I understand that the difference between the national and the state standards are substantial with Oregon DEQ standards being more protective of humans. My experience has been that in rural areas and cities in our case if you don't live in John Day or Baker City as an example they don't even care what the air quality is as if to say rural lives don't matter.

They are telling us with the hope we will believe that prescribed fire at today's pace and scale has fewer negative smoke-related health impacts than wildfire and wood stove use, due to shorter durations as if to say… this comparison reduces the additional health risks that are added from prescribed burning. Our experience with prescribed fire is once they light the fire they don't put it out and you can/have had heavy smoke, day and night for day-after-day.

It is my opinion DEQ standards are more protective of human health related to smoke inhalation. Don't feel undue pressure to align Oregon's smoke policies with EPA's standards simply due to the bad impact it will have on communities, people, animals, plants, and vulnerable groups.

Prescribed Burning and other Forest Management Options need to be balanced with Public Health. For 20 plus years now various agencies and their partners have wanted to do a better job of managing the forests; however they continue to pursue the same management strategies, but now with a focus on pushing the air quality limits (willing to make a policy of over the limits and they will take the consequences; i.e., warnings, write ups, fines, etc.) to gain additional prescribed fire burn days.

Oregon's annual wildfires emit more carbon monoxide, nitrous oxide, fine particulates and volatile organic compounds than industrial sources or vehicles. We don't need more.

Changes in smoke management regulations are not needed.

A shift to a comprehensive, diverse, and safer array of forest management strategies is needed. Don't make health trade-offs when there are other, safer options already available. Please do not weaken Oregon's DEQ air quality standards.

Thank you!

Frances Preston, Prairie City

Response #159

Thank you for your comment.

Comment #160

Thank you ODF and DEQ for the opportunity to comment on the proposed changes to the Oregon Smoke Management Plan. The 2018 fire season shows yet again that we need to increase the use of prescribed fire on our forested landscapes, especially near our homes and communities. A rule change that facilitates more prescribed burning across land ownerships will reduce the amount of fuels contribution to large scale intense wildfires. Prescribed fire provides an essential tool to take proactive steps to reduce the fire hazard around communities and restore forest conditions, especially in light of climate change.

I support the work by ODF and DEQ in providing public meetings and comment opportunities. I support the agencies work to align Oregon's Smoke Management Rules with the Clean Air Act 24-hr National Ambient Air Quality Standards (NAAQS). It is important tot maintain a balance between public health and reducing fire hazards in the lands that surround our homes and communities.

I am concerned that the proposed 1-hour threshold limits the amount of prescribed burning conducted. This will

impose unnecessary restrictions on critical prescribed burning priority areas that are most vital to reducing smoke effects from wildfires here in Southwest Oregon. I support a clear, simple, and attainable process to obtain an exemption from the 1-hour smoke threshold when communities have implemented a smoke communication and mitigation plan.

Many of the fire prone forests of southern Oregon are arranged in a checkerboard ownership pattern with industrial land interwoven with Southern Oregon BLM Lands. Industrial timber plantations have been proven by science to burn faster, hotter, leading to more smoke production that natural forests. In addition to increasing prescribed fire and slash disposal, ODR should consider rules to ensure that private industrial forest practices do not increase future fires hazards and smoke production by limiting clearcutting and the production of activity slash. Also, aerial herbicides application and the practices of hack and squirt can cause widespread hardwood die-off, leaving senescent, dry vegetation on site and increase fire hazards on the landscape.

As the affected public I have a vested interest in providing these comments to influence when and to what degree the lands within Southwestern Oregon will burn. Using prescribed fire in forest restoration projects under the correct weather conditions will allow smoke to penetrate into the atmosphere an dnot remained trapped, as it often does in the summer months.

I would like ODF and DEQ to fund more weather balloon launches on burning days to help accurately understand the burning conditions of the geographically complicated and rigid mountains and valleys of southern Oregon. A balloon launch from a single point in Medford is unlikely to provide substantive data to be able to accurately identify favorable atmospheric conditions for prescribed burning opportunities for the Applegate Valley, or the Upper Rouge, or the Illinois Valley.

I believe the short term impacts of prescribed fire will be far less than the smoke impacts of wildfire during hot and dry conditions when atmospheric temperature inversions trap smoke in the valley. Prescribed burning can offset the amount of fuels available when wildfire does strike in subsequent years.

Marion Hadden

Response #160

Thank you for your comment.

Comment #161

I supports allowing prescribed burning on more areas of forest than previously allowed. I also suggest allowing more hours of smoke intrusions and smoke incidents in SSRAs.

The more that can be done outside of Fire Season, to reduce the intensity of fires during the Fire Season will benefit Oregon.

I am part owner and manager of more than 2,000 acres of forest land in Jackson County.

Judson Parsons

Response #161

Thank you for your comment.

Comment #162

Please accept the following comments on behalf of the Deschutes Land Trust, concerning the proposed rule

changes to Oregon's Smoke Management Plan. The Deschutes Land Trust manages conservation lands across much of the Deschutes Basin. We recognize that fire is a natural part of our ecosystem, but are concerned by what appears to be the growing scale and intensity of wildfire on the landscape. While multiple factors contribute to these trends, it's clear that the natural fire cycle has been disrupted, resulting in greater concentrations of fuels throughout central Oregon's forests. We and other land managers are working collaboratively to reduce this unnatural concentration of fuels and make our natural lands more resistant. However, to be successful at a landscape scale, land managers need the full range of tool, including the strategic use of prescribed fire in the forests immediately near our communities. To be clear, these are not normal times and conditions demand a more forward-thinking smoke management policy in Oregon.

For these reasons, we endorse the effort to align Oregon's smoke management rules with the federal Clean Air Act 24-hour National Ambient Air Quality Standards (NAAQs). We believe that using the NAAQS (including the proposed buffer of 75% of the NAAQS) to define smoke intrusions strikes an appropriate balance by addressing our shared interest in protecting public health, minimizing smoke entering communities, and allowing critical prescribed burning to occur as we work together to confront the very real wildfire threat facing our communities.

We also endorse the position of our partners at the Deschutes Collaborative Forest Project, along with most of central Oregon's local governments that the 1-hour threshold, runs counter to our interest in a smoke management policy that account for the short and long-term consequences of wildfire. We've come to believe that the 1-hour threshold would impose a significant limitation on the very prescribed burning priority areas that are most critical to our community wildfire protection efforts here in central Oregon. Consequently, we endorse the smoke management rule package, contingent upon the inclusion of the provision providing communities a clear, simple, and attainable process to obtain an exemption from the 1-hour smoke threshold when they have implemented a smoke communication and mitigation plan.

Thank you for the opportunity to provide comment on the proposed rules.

Brad Chalfont, Executive Director, Deschutes Land Trust

Response #162

Thank you for your comment. Guiding legislation for the Smoke Management Program directs ODF and DEQ to seek a balance of the use of prescribed fire as a forest management practice with the protection of public health from prescribed fire smoke. The proposed rulemaking is an effort to balance these two policy outcomes. Based on an evaluation of past prescribed fire intrusions, the proposed rule changes would provide for a roughly 80% increase in the opportunity for prescribed fire utilization. Additionally, the proposed rules allow for communities to conduct burns that are projected to exceed the proposed 1-hour average threshold as long as those communities first develop a program for proactively notifying the public about upcoming burns, implement mitigation strategies to protect the most vulnerable in their communities, and receive approval from their local authority and both ODF and DEQ, in consultation with the OHA

Public Hearing Comments and Responses:

Audio recordings of each public hearing are maintained by DEQ as part of the public record for this rulemaking and can be made available to the public upon request. The following are summaries of comments received during the public hearing.

La Grande Hearing, August 21, 2018, at 7:00 p.m.

Prior to the hearing, Michael Orman from the Department of Environmental Quality (DEQ) and Nick Yonker from the Oregon Department of Forestry (ODF) provided a joint PowerPoint presentation on the background and operations of the Smoke Management program and proposed changes to the Oregon Smoke Management Plan.

The rulemaking hearing on the proposed rules was convened. People were asked to sign registration forms if they wished to comment on the proposed rules and were informed of the procedures for taking comments. They also were told that the hearing would be recorded.

Before receiving comment, there was an informal opportunity for the attendees to raise questions about the proposed rules and hearing officers Tim Holschbach and Peter Brewer, ODF and DEQ staff provided answers to the questions. Once questions were answered, Ray Guze, a private prescribed fire consultant, provided the only testimony. His comments are summarized below.

Summary of Oral Comments – La Grande

Public Hearing Comment #1

Ray Gusey: Mr. Gusey's comments expressed a desire for programs initiated by ODF, with the objective to reach private landowners and provide them with support and information on burning their own lands. Mr. Gusey commented that he is supportive of the two agencies working together, and he is encouraged that they are also working with the State of Washington DNR.

Response #1: Thank you for your comments.

There were no additional comments. The hearing was adjourned at 8:30 p.m.

Bend Hearing, August 22, 2018, at 7:00 p.m.

Prior to the hearing, Michael Orman from the Department of Environmental Quality (DEQ) and Nick Yonker from the Oregon Department of Forestry (ODF) provided a joint PowerPoint presentation on the background and operations of the Smoke Management program and proposed changes to the Oregon Smoke Management Plan.

The rulemaking hearing on the proposed rules was convened. People were asked to sign registration forms if they wished to comment on the proposed rules and were informed of the procedures for taking

comments and submitting written comments. They were also told that the hearing would be recorded.

Before receiving comment, there was an informal opportunity for the attendees to raise questions about the proposed rules and hearing officers Tim Holschbach and Peter Brewer, ODF and DEQ staff provided answers to the questions. Once questions were answered, the following individuals provided verbal comment:

Summary of Oral Comments – Bend

Public Hearing Comment #2

Joe Stutler: Mr. Stutler, on the behalf of the Western Regional Strategy Committee (WRSC), supports the proposed rules and also supports an exemption to the one hour smoke threshold. Comments were directed toward both agencies.

Response #2*:* Thank you for your comments.

Public Hearing Comment #3

Marilyn Miller: Ms. Miller, on the behalf of Miller Conservation Consulting, commented that they support the one hour exemption so that additional burn days can be added. She commented that Deschutes County has 9-10 burn days per year, and they are "backlogged" approximately one hundred thousand acres. Comments were directed toward both agencies.

Response #3: Thank you for your comments.

Public Hearing Comment #4

Sally Russell: Councilor Russell, on the behalf of the Deschutes Collaborative Forest Project, and the Bend City Council, appreciates the rule revision and is encouraged by an effort to better align Oregon with the National Air Quality Standards. She commented that they are concerned about the proposed one hour smoke threshold, and stated that their support is contingent on the inclusion of a realistic exemption to the smoke threshold for communities which have developed and implemented a smoke mitigation plan. Councilor Russell did not specify which department her comments were directed toward.

Response #4: Thank you for your comments.

Public Hearing Comment #5

Roger Johnson: Mr. Johnson, on the behalf of the Sisters-Camp Sherman Fire District, commented that the district supports the changes to the rules. He also commented that they were concerned that the one hour threshold would limit the amount of prescribed burns in the most critical areas. Overall, they support the proposed rules, but encourage both agencies to provide more flexibility to the one hour threshold. Comments were directed toward both agencies.

Response #5: Thank you for your comments.

Public Hearing Comment #6

Phil Henderson: Commissioner Henderson, on the behalf of Deschutes County, commented that they support an exemption to the one hour rule, and also expressed that although they are grateful for ODF and DEQ "working at the edges", they stated that Deschutes County has had eight weeks of suppressive smoke, and helping prevent larger fires is a bigger priority than pure air. Comments were directed toward both agencies.

Response #6: Thank you for your comments.

Public Hearing Comment #7

Keith Windsor: Mr. Windsor, on the behalf of the Central Oregon Smoke and Public Health Collaborative, commented that prescribed fire smoke is significantly less toxic than forest fire smoke, and that they would like ODF and DEQ to provide an exemption to Central Oregon of the one hour smoke threshold for prescribed burns. Comments were directed toward both agencies.

Response #7: Thank you for your comments.

Public Hearing Comment #8

Ray Miao: Mr. Miao, on the behalf of the Deschutes County Rural Fire Protection District No. 2, and the Fire Safety Committee for the Woodside Ranch Homeowner's Association, commented that the Fire Protection District board has already sent letters to each agency. In these letters and comments, they express support for the Oregon Smoke Plan amendments, excluding the one hour smoke rule. Mr. Miao stated that they support any amendments that allow more prescribed burns in the area, and that they also appreciate receiving a notification of prescribed burns when they occur. Comments were directed toward both agencies.

Response #8: Thank you for your comments.

Public Hearing Comment #9

Ed Keith: Mr. Keith, as the Deschutes County Forester and Vice Chair for the Deschutes Collaborative Forest Project, requests a better alignment for intrusions regarding the Clean Air Act, and flexibility for prescribed burning. He is supportive of the alignment with the seventy-five percent buffer and Ambient National Air Quality Standards, but does not support the one hour standard. Mr. Keith commented that the one hour standard should not be included in the final ruling. If the one hour standard is included, Mr. Keith requests that a public notification system be implemented, and that the exemption process be made clearer for at-risk communities. Comments were directed toward both agencies.

Response #9: Thank you for your comments.

Public Hearing Comment #10

Anthony DeBone: Commissioner DeBone, on the behalf of Deschutes County, commented that they support the new rules in alignment with the Ambient National Air Quality Standards, but not the one hour rule. Commissioner DeBone supports the exemption process if the one hour burn rule is implemented.

Response #10: Thank you for your comments.

Public Hearing Comment #11

Pete Caliguiri: Mr. Caliguiri, on the behalf of The Nature Conservancy (TNC) based out of Bend, Oregon, commented that they support the use of a buffer below the 75% Ambient National Air Quality, however, they have concerns about the one hour prescribed burning threshold. Mr. Caliguiri hopes that through forest thinning and prescribed burning, ODF and DEQ will "choose a more balanced answer".

Response #11: Thank you for your comments.

Public Hearing Comment #12

Nicole Strong: Ms. Strong, as an Extension Forester with Oregon State University, commented that she appreciates the revision and supports the alignment of the smoke rules with the Ambient National Air Quality standards, however, she has severe concerns about the one hour threshold on prescribed burns. Ms. Strong commented that if the one hour threshold remains, she requests that an exemption process is outlined with it. Comments were directed toward both agencies.

Response #12: Thank you for your comments.

Public Hearing Comment #13

Melanie Fisher: Ms. Fisher, on the behalf of the Central Oregon Trail Association (COTA), and the Cog Wild Mountain Biking Company, supports the changes to the smoke management rules, as long as it allows the provision for exemptions to the one hour burn ban. She commented that as a previous business owner, prescribed burns don't affect their economy as much as wildfire does. Ms. Fisher did not specify which department her comments were directed toward.

Response #13: Thank you for your comments.

Public Hearing Comment #14

Erik Fernandez: Mr. Fernandez, with Oregon Wild, commented that he would urge the ODF and DEQ to reconsider allowing the burning of more plastic sheets, and that increased flexibility is just "tinkering around the edge" of 100 years of fire suppression. Comments were directed toward both agencies.

Response #14: Thank you for your comments.

There were no additional comments from participants who were calling in. The hearing was adjourned at 8:50 p.m.

Klamath Falls Hearing, August 23, 2018, at 7:00 p.m.

Prior to the hearing, Michael Orman from the Department of Environmental Quality (DEQ) and Nick Yonker from the Oregon Department of Forestry (ODF) provided a joint PowerPoint presentation on the background and operations of the Smoke Management program and proposed changes to the Oregon Smoke Management Plan.

The rulemaking hearing on the proposed rules was convened. People were asked to sign registration forms if they wished to comment on the proposed rules and were informed of the procedures for taking comments and submitting written comments. They were also told that the hearing would be recorded.

Before receiving comment, there was an informal opportunity for the attendees to raise questions about the proposed rules and hearing officers Tim Holschbach and Peter Brewer, ODF and DEQ staff provided answers to the questions. Once questions were answered, the following people provided comment.

Summary of Oral Comments – Klamath Falls

Public Hearing Comment #15

Daniel Levelle: Mr. Levelle, with the Oregon State University College of Forestry, and as the Fire Agent for the Forestry Natural Resources Extension, commented that he believes the corrections DEQ and ODF have made are sound, however, he wanted to endorse a letter submitted by the Nature Conservancy on August 16, by Mark Stern, a valued partner: They agree with the revisions up to the one hour prescribed burn ban, and request that exemptions be available. Other recommendations Mr. Leville had was that if there is a health based standard ODF and DEQ are using, to ensure that the metrics used are monitored so that the correct information can be given to the affected communities, and partnering with Public Health and designating an authority for this task, so that there's a point of contact and increased accountability. Mr. Levelle did not specify which department his comments were directed toward.

Response #15: Thank you for your comments.

Public Hearing Comment #16

Craig Brenz: Mr. Brenz, with the Nature Conservancy, commented that they have been working with the Klamath Lake Health Partnership, and other collaboratives throughout the state. Mr. Brenz expressed support for the rules, providing that the proposed exemptions from the prescribed burns are maintained into the final ruling. He would also like the final rule to outline a clear process with specific measurable criteria for communities to be engaged and involved. Comments were directed toward both agencies.

Response #16: Thank you for your comments.

There were no additional comments. The hearing was adjourned at 8:26 p.m.

Eugene Hearing, August 28, 2018, 7:00 pm

Prior to the hearing, Michael Orman from the Department of Environmental Quality (DEQ) and Nick Yonker from the Oregon Department of Forestry (ODF) provided a joint PowerPoint presentation on the background and operations of the Smoke Management program and proposed changes to the Oregon Smoke Management Plan.

The rulemaking hearing on the proposed rules was convened. People were asked to sign registration forms if they wished to comment on the proposed rules and were informed of the procedures for taking comments and submitting written comments. They were also told that the hearing would be recorded.

Before receiving comment, there was an informal opportunity for the attendees to raise questions about the proposed rules and hearing officers Tim Holschbach and Peter Brewer, ODF and DEQ staff provided answers to the questions. Once questions were answered, the following individuals provided verbal comment.

Summary of Oral Comments – Eugene

Public Hearing Comment #17

David Stone: Mr. Stone, a resident of Eugene, Oregon, suggested some tools to minimize smoke in Oregon: Controlled burns, restoration thinning to remove smaller, fire-prone trees, and diverting funds to controlled burns and restoration projects. Mr. Stone recommends off-season burns which would provide a stable year-round workforce, saving turnover and employment costs. Mr. Stone also advocates for building codes to enforce fire-safe construction in urban locations. Comments were directed toward both agencies.

Response #17: Thank you for your comments.

Public Hearing Comment #18

Dave Cramsey: Mr. Cramsey, as Forestry Manager for Roseburg Forest Products, will submit written comments prior to September 14th, but he wanted to extend his gratitude to ODF and DEQ. He commented that although convincing people to allow smoke into the communities was going to be difficult, they realize it is a trade-off and that there are long term benefits to the situation.

Response #18: Thank you for your comments.

Public Hearing Comment #19

Kyle Williams: Mr. Williams, as Director of Forest Protection for the Oregon Forest and Industries Council (OIFC), commented that they support most of the changes, and are thankful for the new language in the rules. The OIFC would like to voice support for allowing expanded use of polyethylene covers for an emission-reduction technique. The burn piles with these covers showed reduced emissions and increased burn productivity. The OIFC will be submitting additional written comments. Comments were directed toward both agencies.

Response #19: Thank you for your comments.

Public Hearing Comment #20

Kirsten Aird: Ms. Aird, on the behalf of the Oregon Health Authority, Public Health Division, read from a statement signed by the Public Health Director: OHA commented that the Health Authority prefers the rules as they stand, but under Oregon's changing climate, they accept the proposed rules as drafted. The OHA also commented that the one hour burn limit is very important to them. Anything revising this would be a dealbreaker. They suggest one change: a permit process, rather than an exemption, in the hope that this will make individuals seeking an exemption understand that they are letting more smoke into their community. OHA stated that they will provide advice to both agencies during this process.

Response #20: Thank you for your comments. Public health is a vital concern in these smoke management rules.

Public Hearing Comment #21

Ted Reiss: Mr. Reiss, a professional forester and resident of Eugene, commented that he strongly supports the changes as proposed. He stated that ODF and DEQ need to be clear about this being a small step forward, and they need to understand that this is not going to change the problem overnight. Comments were directed toward both agencies.

Response #21: Thank you for your comments.

Public Hearing Comment #22

Amanda Stamper: Ms. Stamper, on the behalf of the Oregon Prescribed Fire Council, commented that they acknowledge the rules should address the safety of the public in both wild and prescribed burns. They support the plan moving forward, but express concern at the limiting of prescribed burns. Ms. Stamper states that they would like more communication with the public for prescribed burns, and they support exemptions to the one hour rule. Comments were directed toward both agencies.

Response #22: Thank you for your comments.

Public Hearing Comment #23

Merlin Hough: Mr. Hough, on the behalf of the Lane Regional Air Protection Agency, commented that although they are concerned about air quality due to prescribed and wild burns, they recognize the need for an amendment to the rules. Mr. Hough recommended the following options to consider for smoke reduction strategies: increased use of polyethylene sheeting, increased biomass utilization of forest slash piles, to reduce the amount burned in the forest, and the use of auxiliary combustion enhancement equipment to reduce smoke. Mr. Hough stated that this would communicate to the public that additional efforts were being made to control and reduce smoke. Comments were directed toward both agencies.

Response #23: Thank you for your comments.

Public Hearing Comment #24

Riley Newman: Ms. Newman, a resident of Cottage Grove, Oregon, comments that she supports the rules and changes as proposed, and hopes that ODF and DEQ can provide more prescribed burns for field reduction. Comments were directed toward both agencies.

Response #24: Thank you for your comments.

There were no additional comments. The hearing was adjourned at 8:23 p.m.

Medford Hearing, August 29, 2018, at 7:00 p.m.

Prior to the hearing, Michael Orman from the Department of Environmental Quality (DEQ) and Nick Yonker from the Oregon Department of Forestry (ODF) provided a joint PowerPoint presentation on the background and operations of the Smoke Management program and proposed changes to the Oregon Smoke Management Plan.

The rulemaking hearing on the proposed rules was convened. People were asked to sign registration forms if they wished to comment on the proposed rules and were informed of the procedures for taking comments and submitting written comments. They were also told that the hearing would be recorded.

Before receiving comment, there was an informal opportunity for the attendees to raise questions about the proposed rules and hearing officers Tim Holschbach and Peter Brewer, ODF and DEQ staff provided answers to the questions. Once questions were answered, the following individuals provided verbal comment:

Summary of Oral Comments – Medford

Public Hearing Comment #25

Kathleen Page: Ms. Page, a resident of Southern Oregon, commented that she is tired of wildfires and that she would like tree thinning and a science based approach to this matter. Ms. Page also stressed that the community needs to see proof that fire fighting efforts are working, and they want more accountability from ODF and DEQ. Ms. Page also commented that most activity is being done on private forest lands, and she wants to know if there is a way to involve federal landowners, as well.

Response #25: Thank you for your comments.

Public Hearing Comment #26

Joseph Rice: Mr. Rice, on the behalf of the Josephine Rice Share, commented that there needs to be a clear and defined objective to what this program does, and that it should be driven by that objective. Mr. Rice stressed that Medford has been heavily affected by the loss of tourism, as this is their 5th year in a row of heavy smoke. Mr. Rice also commented that the body needs to be meeting every 2.5 years, instead of 5,

and that hearings should also be held in Josephine and Douglas County.

Response #26: Thank you for your comments. We held five hearings around the State and could not hold hearings in every community.

Public Hearing Comment #27

Chris Chambers: Fire Chief Chambers, on the behalf of Ashland fire and rescue, commented that he would like the committee to remove the one hour standard burn time, since he had observed the yearlong committee and one decision that had not come from that was the one hour standard.

Response # 27: Thank you for your comments.

Public Hearing Comment #28

Alan Journet: Mr. Journet, on the behalf of the Southern Oregon Climate Action, commented that he is in support of an increase of prescribed fires. He also commented that Mediterranean climates are fire- prone, fire-adaptive, and fire-reliant.

Response # 28: Thank you for your comments.

Public Hearing Comment #29

Jack Shippley: Mr. Shippley, on the behalf of the Applegate Partnership and Watergate council, and the chair of the Southern Oregon Chapter of the Prescribed Fire Council, commented that his family used prescribed fire a year ago in the spring to burn the upper 40 acres of their property. They are at a high risk for forest fires, since they are surrounded by the BLM on all four sides. Mr. Shippley commented that they support the revision in the proposed rule, providing that communities can obtain an exception to the one hour smoke threshold. They would prefer to remove the one hour standard completely, and follow the EPA's standards for air quality. Mr. Shippley also supports the use of thinning forest properties.

Response # 29: Thank you for your comments.

Public Hearing Comment #30

Brodea Minter: Ms. Minter, an employee of KS Wild, representing her own thoughts, commented concern about the one hour threshold and believes it will impose unnecessary restrictions. Ms. Minter requests that ODF funds more fire research and utilizes fire crews in the off season to burn landscapes that are dependent on fire. She also comments that ODF should ensure that private forest practices do not increase fire hazards, that a community response protection plan be outlined, that they should limit clearcutting, and encourage the production of more Biochar systems as an alternative to thinning. Ms. Minter additionally expressed that she would like to see ODF and DEQ encourage using kraft paper as an alternative cure to burning polyethylene. Ms. Minter supports the agency's alignment of smoke management rules with the national air ambient quality standards. Comments were directed toward both agencies.

Response #30: Thank you for your comments.

Public Hearing Comment #31

Ronald Rothrock: Mr. Rothrock, a resident of Medford, commented that he is against increasing any controlled burns in the off-seasons. Mr. Rothrock commented that smoke during off-seasons will make it less recreationally appealing, that it isn't appropriate, and that residents are not prepared for it. He commented that he supports non-fire methods of clearing, and also encourages more public advertising for these meetings. The only reason he was present, was because a local radio station mentioned it.

Response # 31: Thank you for your comments.

Public Hearing Comment #32

John Stromberg: Mr. Stromberg, a worker on the Ashland Forest Resistance Program, commented that the issues with controlled burns is that they haven't been able to compete with the production of new fuels. Mr. Stromberg states that ODF and DEQ need to keep working on the changes in the rules, and that the one hour standards were created in an arbitrary way, even if they're seeking to protect vulnerable populations. Mr. Stromberg commented that applying this regulation earlier, would have meant overall less controlled burning, instead of more. He recommends that they make exemptions to the one hour standard.

Response #32: Thank you for your comments.

Public Hearing Comment #33

Sarah Wallen: Ms. Wallen, a resident of Medford, Oregon, stated that she has severe asthma which is heavily affected by smoke, and is a member of at risk populations in Oregon. Ms. Wallen commented to say that ODF and DEQ should do as much prescribed burning as possible, even though she is grateful for the plan to revise the rules.

Response #33: Thank you for your comments.

Public Hearing Comment #34

Simon McNeuty: Mr. McNeuty, a resident of Medford, Oregon, commented that he believes the first policy that DEQ and ODF should implement is to allow free-range grazing for farm animals, and to let everyone pick out a dead stick from the forests. Mr. McNeuty stated that private properties should do controlled burns, but that he doesn't believe public lands should. He doesn't want these prescribed burns controlling or impeding their way of life. Mr. McNeuty also commented that the one hour burn ban should be thrown out, and that he is supportive of controlled burns.

Response #34: Thank you for your comments.

Public Hearing Comment #35

Hiram Toll: Mr. Toll, on the behalf of the Ashland Ski Area, commented that he is supportive of the twenty-

four hour standard, not the one hour standard. Mr. Toll commented that he would like to see ODF, DEQ, and the surrounding communities embrace fire and use it as a tool to make the forests more resilient.

Response #35: Thank you for your comments.

Public Hearing Comment #36

Terry Fairbanks: Ms. Fairbanks, on the behalf of the Southern Oregon Restoration Collaborative, commented that if ODF and DEQ does increase prescribed burning, that they should work with communities to prepare them. Ms. Fairbanks supports the alignment with the National Air Quality Standards, but is concerned about the one hour standard.

Response # 36: Thank you for your comments.

Public Hearing Comment #37

Darren Ogress: Mr. Ogress, on the behalf of the Nature Conservancy, commented that they appreciate the work done by ODF and DEQ, and they support the proposed rules and seventy-five percent buffer in alignment with the air quality standards, however, they have significant concerns with the one hour threshold, since it restricts communities' ability to burn. Mr. Ogress commented that the Nature Conservancy's support for the proposed rules and one hour threshold is subject to opportunities for communities to obtain exemptions to the rule, given local resources and capacities.

Response #37: Thank you for your comments.

Public Hearing Comment #38

Ted Bennett: Mr. Bennett, a resident of Medford, Oregon, commented that he has been hearing many stories about the US Forestry Service and ODF showing minimal cooperation, and rejecting offers from civilians to assist with putting small, local fires out. Mr. Bennett commented that he does not support allowing fires to burn, when they could be stopped. He requested that ODF make a statement on their policies regarding forest fires, and that they make it very clear to the affected communities.

Response # 38: Thank you for your comments.

There were no additional comments. The hearing was adjourned at 9:25 p.m.

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

POLICY: This directive provides operational procedures to implement the Oregon Smoke Management Plan. The objectives of the Smoke Management Plan are to:

A. ~~Prevent~~ Minimize smoke emissions resulting from prescribed burning ~~on forestlands from being carried to or accumulating in Smoke Sensitive Receptor Areas (SSRAs) or other areas sensitive to smoke, and to provide maximum opportunity for essential forestland burning while minimizing emissions;~~as described by ORS 477.552.

B. Provide maximum opportunity for essential forestland burning;

~~A.~~C. Protect public health by avoiding intrusions;

~~B.~~D. Coordinate with other state smoke management programs;

~~C.~~E. Comply with state and federal air quality and visibility requirements; and

~~D. Protect public health; and~~

~~E.~~F. Promote the ~~reduction of~~ further development of techniques to minimize or reduce emissions by encouraging cost-effective utilization of forestland biomass, alternatives to burning, and ~~alternative burning practices~~emission reduction techniques.

AUTHORITY: This directive implements ORS 477.013, 477.515, ORS 477.552 through 562, OAR 629-043-0040, and OAR 629-048-0001 through 629-048-0500.

DEFINITIONS: See OAR 629-048-0005.

STANDARDS:

A. The Smoke Management Rules: The Smoke Management administrative rules (OAR 629-048-0001 through 629-048-0500) provide a specific framework for the administration of the Smoke Management program by the State Forester. The plan requires the State Forester and each field administrator to maintain a satisfactory atmospheric environment in SSRAs, federal Class I Areas, and other areas sensitive to smoke (OAR 629-048-0230(8)).

In administering the Smoke Management Plan, the State Forester and the field administrators will monitor weather and air quality conditions in SSRAs and other areas sensitive to smoke.

In order to meet air quality standards and the objectives stated above, restrictions on prescribed forestland burning are applied through issuance of Smoke Management instructions by the State Forester in order to limit the amount of particulate matter that is released into the airshed.

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

B. Plan Applicability: The Smoke Management Plan applies to all lands classified as forestland under ORS 526.305 to 526.370 and all federally managed forestland, whether or not classified, within a forest protection district. See OAR 629-048-0100 for specifics. In general, all federal forestland and Class 1 forestland in Western Oregon is regulated at a higher level but all forestland owners and managers must comply with various aspects of the program.

C. Smoke Management Forecasts and Instructions: To keep minimize the amount of smoke out of entering SSRAs, as described in OAR 629-048-0140, and other areas sensitive to smoke (OAR 629-048-0005(22)). the The Smoke Management forecast unit issues daily forecasts and instructions during periods of substantial prescribed burning.

1. Smoke Management forecasts shall be issued as needed for three regions within the regulated area; Western Oregon, including Fire Weather Zones 601 through 612, Zones 615 through 623, and 639; Central and Northeast Oregon, including Fire Weather Zones 640 through 646; and South-Central Oregon, including Fire Weather Zones 624 and 625.

   Written Smoke Management forecasts are normally issued during the period from late March through June and mid late September through NovemberDecember, when significant prescribed burning is being conducted. Forecasts are written at other times as dictated by weather and the level of burning. Special written forecasts shall be issued when requested for specific burns, as forecaster workload permits.

   Scheduled forecasts shall be issued in mid afternoon and are valid for the next day. Forecasts shall be disseminated no later than 3:15 p.m. When necessary, an updated forecast shall be issued if significant changes from the previous forecast have occurred or are expected. When possible, updated forecasts will be issued in the early morning, normally before 8:00 a.m. However, updates may be issued at other times when necessary.

   a. Dissemination. Forecasts shall be disseminated by e-mail and made available on the Oregon Department of Forestry web site (http://www.oregon.gov/ODF/Pages/fire/fire.aspx#Smoke_Management_InformationFire/Pages/Burn.aspx). The Western Oregon forecast shall also be placed on a telephone message recording.

   b. Content. Forecasts include four main sections: a general discussion of the weather expected through the forecast period; specific mixing, transport wind, and surface wind forecasts; a general outlook for the following three days; and daily outlooks for mixing height, transport wind, and surface wind. Updated forecasts may not include outlooks.

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

2. Instructions and/or advisories shall be issued in conjunction with each Smoke Management forecast. For forestland included in Level 1 regulation, as defined in OAR 629-048-0005(19), instructions detail the locations and amounts of material that may be burned, provide minimum separation from SSRAs, and other restrictions as may be necessary to ~~prevent~~ minimize smoke impacts. In areas of Level 2 regulation, the information may be considered an advisory but adherence is strongly encouraged and burn bosses should use the forecasts and instructions to minimize the possibility of drifting smoke into SSRAs.

   a. When significant burning is taking place, the Smoke Management forecast unit shall issue written instructions with the forecasts. Outside the period when written forecasts and instructions are issued, burning shall be carried out only after consultation with the forecaster. ~~Note that during the visibility protection period (OAR 629-048-0130) Class I Wilderness Areas shall be protected in the same manner as SSRAs.~~

   b. Special Protection Zones (SPZ) have been established around certain communities requiring additional protection from particulates. Any burning in an SPZ, during its protection period, must have the approval of the meteorologist. Specific control strategy restrictions for these areas adopted by the Department of Environmental Quality (DEQ) and Oregon Department of Forestry (ODF) are found in ~~Appendix 5~~OAR 629-048-0135 and OAR 629-048-0137. SPZ maps are found in Appendix 5.

   c. Air Stagnation Advisories (ASA) are issued by National Weather Service forecast offices for areas where atmospheric conditions are likely to allow air pollutants to accumulate for an extended period. Burning within the area of an ASA must be closely controlled and Smoke Management instructions issued when an ASA is in effect will limit forestland burning to units which are not expected to worsen air quality within the area. Similar restrictions shall apply for areas for which an air pollution alert has been issued by DEQ.

   d. The instructions shall be considered a directive from the State Forester for all burning in areas of Level 1 regulation. Any planned variances from the daily burning instructions must be discussed with the Smoke Management duty forecaster. OAR 629-048-0230(6) requires that variances from the instructions must be documented by the burn boss. In addition, variances or revisions to the instructions will be logged by the Smoke Management forecaster as workload permits.

   e. For forestland included in Level 2 regulation, (OAR 629-048-0005(20)), compliance with the Smoke Management instructions is encouraged.

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

Instructions will identify the amount of material that may be burned, those locations where burns should not be conducted, and other special considerations necessary to ~~prevent~~ minimize the amount of smoke from being carried into SSRAs.

D. Burning Operations: All burning must be conducted in compliance with the Smoke Management Plan. The burn procedures of OAR 629-048-0230 set the minimum requirements that must be met for conducting each prescribed burn.

1. In areas of Level 1 regulation, units must be registered for burning seven days prior to burning (OAR 629-048-0300), planned in the data system the day of the proposed burn (OAR 629-048-0230(4)), and accomplishments reported the first business day following the actual burn (OAR 629-048-0320) and each additional day that burning is conducted in the unit.

2. For forestland subject to Level 2 regulation, burning is not required to be planned prior to burning. However, all burns must be registered prior to burning and accomplishment reported by the first business day of the week following ignition. Specific requirements for reporting are detailed in Appendix 1.

3. In addition to adhering to the restrictions of the Smoke Management forecasts and instructions, burn bosses must monitor on-site conditions and be prepared to terminate ignition or take other appropriate action if conditions warrant. Burns conducted in areas of Level 2 regulation are not required to adhere to the instructions/advisories but are strongly encouraged to follow the guidance and burn in such a manner to ~~prevent~~ minimize smoke ~~from~~ impacting SSRAs or other smoke sensitive areas.

4. The Smoke Management forecaster should be consulted before burning under marginal dispersal conditions and for large or multi-day burns. If notified at least two days in advance of extended period burns and burns ~~of~~ greater than 2000 tons, the Smoke Management forecaster will, workload permitting, prepare a forecast specific to the unit being burned.

E. Monitoring: When necessary, the State Forester shall monitor prescribed burning operations by aircraft and/or other means to ensure compliance with the Smoke Management Plan and to determine the effectiveness of Smoke Management procedures. During marginal conditions or when burning is being conducted near SSRAs or other smoke sensitive areas, monitoring of smoke behavior should be intensified as needed by using lookouts, aerial observations, and on-site observations of smoke behavior. A recommended aerial monitoring form is provided in Appendix 4. For some areas, near real-time data from DEQ air quality monitors ~~is~~ and cameras are available via the internet. This information is used in the preparation and validation of daily Smoke Management instructions and in the evaluation of smoke impacts.

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

~~F. Emissions Limits: In Northeast Oregon limits have been established to prevent a net increase in forestland emissions as prescribed burning (including wildland fire use (WFU)) on identified national forestland is increased to restore forest health and reduce wildfire. Using a baseline total emissions estimate of 17,500 tons of Particulate Matter (PM) 10 for the period of 1987 – 1993 and a wildfire target of 2,500 tons of PM10 per year, a limit of 15,000 tons of PM10 per year for prescribed and WFU has been set. This limit applies to the combined emissions from the Ochoco, Malheur, Umatilla, and Wallowa-Whitman National Forests. The Forest Service and ODF shall track burning and emissions shall be monitored to prevent exceeding this annual limit.~~

~~G.~~F. Audits: To evaluate compliance with the Smoke Management Plan, the State Forester shall conduct a review of approximately one percent of the units burned each year in areas under Level 1 regulation. Approximately one-half of the audits will be conducted on the day of the burn and approximately one-half will be pre-burn audits. All units to be audited shall be randomly selected. Each burn day audit shall include a site visit during burning, visual tracking and documentation of smoke behavior and movement, and a determination of compliance with: (a) the conditions of the burning permit, (b) the provisions of the Smoke Management administrative rules and directives, and (c) the applicable Smoke Management burning instructions. Each pre-burn audit shall include a site visit before burning. An independent fuel inventory shall be conducted to validate accuracy of tonnage estimates.

Following completion of the audits, a written report of all findings must be prepared and forwarded to the Smoke Management unit. Results of these audits shall be summarized and included in the reports of annual Smoke Management activities.

~~H.~~G. Reporting and Analysis: Data for all prescribed forestland burning throughout the state must be entered into the Smoke Management data system.

The Smoke Management data system is maintained to provide for analysis of the program, manage the collection of burn fees, and provide for calculation of prescribed burning emissions. Data for registered, planned, and accomplished burn units shall be reported in accordance with Appendix 1.

1. Alternative practices to reduce burning are contained in OAR 629-048-0200. Field administrators and federal land managers are encouraged to report application of these practices with an estimate of the reduction of material burned to the Smoke Management unit.

2. Use of best burn practices to reduce emissions (OAR 629-048-0210) is encouraged to minimize emissions. Additional information on emission reduction techniques and alternative practices may be accessed through the ODF web pages on the Internet. Informing the Smoke Management unit of specific actions taken to reduce emissions is encouraged.

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

H. Smoke Impacts: There are two types of smoke impacts: , Smoke intrusions of smoke into SSRAs and smoke incidents where significant smoke enters an SSRA at levels below a smoke intrusion (OAR 629-048-0005(27), a Class I Area or other sensitive/populated areas. For two Class I Areas, extra effort (use of test fires or balloon releases to check wind direction or coordinating with the duty forecaster) is needed to keep minimize smoke from the main plume of a prescribed burn from impacting the Kalmiopsis Wilderness and Crater Lake National Park during October and November. If a complaint is received, or district personnel otherwise become aware of an smoke intrusion or smoke incident, the District Forester shall assign a qualified individual to conduct an investigation and document the findings.

1. Smoke incidents: The entry of smoke into Class I Areas, smoke sensitive areas, populated areas that are not designated as SSRAs, or enter SSRAs below the levels of an intrusion shall be evaluated and logged internally, describing the date, time, duration, location, magnitude (if available), area affected, responsible agency, and any noteworthy comments. A smoke incident log is provided in Appendix 2.

3.2. Smoke Intrusions (OAR 629-048-0110): An intrusion occurs when verified smoke from prescribed burning enters an SSRA at ground levellevels , as defined in OAR 629-048-0005 (1827). For every occurrencesmoke intrusion, the source of the impact, the duration, and intensity the magnitude of an the intrusion will be determined, if possible. Intensity Magnitude shall be determined using nephelometer particulate matter (PM) readings when available, or estimated from the reduction of visibility in the smoke intrusion or smoke incident area.

a. When nephelometer PM readings are available, smoke incidents or smoke intrusions will be characterized based on the rise of the nephelometer reading PM values averaged over a one-hour period, or a 24-hour period, measured above the background level prior to the intrusionfrom midnight to midnight. Other sources of smoke will need to be taken into account when using nephelometer data to evaluate an intrusion. Intensity is categorized using the following criteria:

b. Light: less than 1.8×10^{-4} B-scat above background

c. Moderate: 1.8×10^{-4} B-scat to 4.9×10^{-4} B-scat above background

d. Heavy: greater than 4.9×10^{-4} B-scat above background

e.a. Visibility: If no nephelometer PM data is available, or if smoke impacting a community is not observed by a nephelometerPM monitor, the intensity of the short-term (hourly) impact may be estimated from reduction of the

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

prevailing visibility. Distinguishing between Intensity of an smoke intrusion or a smoke incident based on visibility estimates shall be characterized as follows:

SMOKE INTRUSION/INCIDENT CLASSIFICATION BASED ON VISIBILITY REDUCTION (RV)

(See next page)

(For instructions on estimation of visibility see Appendix 2)

Background Baseline Visibility (Miles)*	INTRUSION INTENSITY**VS INCIDENT		
	LIGHT	MODERATEINCIDENT	HEAVYINTRUSION
>50	RV ≥ 11.4	11.4 < RV ≥ 4.6	RV < 4.6
25 - 50	RV ≥ 10.5	10.5 < RV ≥ 4.4	RV < 4.4
20 - 24	RV ≥ 8.1	8.1 < RV ≥ 4.1	RV < 4.1
15 - 19	RV ≥ 7.5	7.5 < RV ≥ 3.8	RV < 3.8
10 - 14	RV ≥ 6.2	6.2 < RV ≥ 3.5	RV < 3.5
5 - 9	RV ≥ 3.7	3.7 < RV ≥ 2.5	RV < 2.5
3 - 4	RV ≥ 2.5	2.5 < RV ≥ 1.8	RV < 1.8
1 - 2	RV ≥ 1.0	1.0 < RV ≥ 0.5	RV < 0.5
< 1	-	-	RV = 0

*Background Baseline visibility is based on the average optimal visibility in the three hours prior to the onset of the intrusionwith little, if any, discernable visibility restriction. Visibility changes due to naturally occurring phenomena must be factored into the classification as needed (e.g., the change from daylight to dark, blowing dust or sand, onset of a rain shower, fog, etc.)

**Intrusion intensity will be adjusted as necessary based on observation of other particulates in the area of the prescribed burning impact.

4.3. Smoke Intrusion Reporting:

a. Preliminary reports shall be issued by the Smoke Management forecasters when they become aware that smoke is has enteringentered, or is about to enter, an SSRA reaching intrusion criteria (OAR 629-048-0005(27). Field administrators must inform the forecaster as soon as they become aware of impacts. Preliminary reports shall be transmitted via email to interested parties as soon as practical.

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

b. Final smoke intrusion reports shall be prepared for all smoke intrusions. The report consists of two sections. The first section is completed by the District ForesterSmoke Management forecaster within two working business days and submitted to the Smoke Management forecasterburn boss or district forester for completion. The forecaster completes the second portion of the analysis of the event andreport is then returned to Smoke Management and distributes distributed the report to interested agencies. A report format is provided in Appendix 2.

b.c. Smoke intrusions that meet or exceed the 24-hour average PM2.5 value of 35 micrograms per cubic meter (National Ambient Air Quality Standard) exceedance will be reported to Smoke Management and the Department of Environmental Quality (DEQ) as soon as possible, but no later than 1one business day after the burn is completed. Reporting will be similar to smoke intrusions but will include management actions (see Appendix 2) to prevent this type of intrusion from occurring in the future. ODF and DEQ will coordinate and agree to what preventative actions will be taken.

5. Smoke incidents: The entry of smoke into Class I Areas, smoke sensitive, or populated areas that are not designated as SSRAs shall be evaluated similar to intrusions except no intrusion number will be assigned to the event.

a. Smoke entering a Class I Area shall be evaluated as a smoke incident. The method for evaluating these impacts is the same as for intrusions and is documented in a similar fashion.

b. Any wildfire that has the potential for smoke input into an SSRA or other area sensitive to smoke shall be reported through the State Forester's Fire Operations Center to Smoke Management personnel. To the extent practical, wildfire smoke impacts in SSRAs shall be evaluated to estimate the length and intensity of these impacts.

I. Complaints: Complaints shall be investigated, appropriately treated, recorded, and the complainant informed of the investigation results in a timely (consistent with other workload), courteous, and professional manner. Data gathered through complaint investigation shall be reported periodically in accordance with OAR 629-048-0450.

A complaint is any report of smoke alleged to be from forestry activity that may adversely impact public health or protected visibility. Any grievance, tip, information, or inquiry which (1) calls into question forest prescribed burning practices such that an on-site investigation is deemed necessary, or (2) appears likely to be a recurring problem such that documentation seems necessary should be treated as a complaint.

1. Receiving Complaints: Districts and Salem Smoke Management staff shall:

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

a. Respond to the complainant in a timely manner.

b. Follow up with appropriate action to the satisfaction of the District Forester.

c. Maintain a written record containing at least: the nature of the complaint, names of those involved in the investigation, findings, and action taken. This record shall be kept on file for two years. Copies shall be sent to the area office and the Salem Smoke Management unit.

d. Inform the complainant of the opportunity to receive follow up of investigation findings.

2. Initial Contact: When a complaint is received, the person receiving the complaint should use the Smoke Complaint Report form found in Appendix 2, page 8 of this directive to record the name(s) of the complainant, the description of the complaint, and where the problem is located. If the complaint is received in Salem or by a district other than the one with geographic responsibility, it shall be referred immediately by the person taking the complaint to the proper district.

   a. If the complainant begins to provide information about health effects resulting from a smoke incident, interrupt the complainant to explain that medical information received by the ODF will become part of the public record and confidentiality cannot be assured.

   b. If a smoke incident or smoke intrusion is ongoing when the complaint is received, reasonable effort should be made to dispatch the nearest qualified department personnel to the location in question to observe and document the date, time, intensity, duration, magnitude, location, scope, and origin of the incidentsmoke.

3. Investigation: Other agencies that may have a role in investigating a complaint shall be promptly informed after the initial contact. ODF personnel will cooperate with other agencies involved in joint complaint investigations.

   a. If the complaint involves an ongoing occurrence, an individual qualified to and capable of investigating the complaint shall be dispatched to the scene immediately. Exceptions must be approved by the District Forester.

      If the problem does not require immediate attention, an onsite investigation may be made at the earliest convenience if such site inspection will contribute to the resolution. In all cases, the complainant should be informed of the planned inspection time, if appropriate.

   b. Observations, notes, and evidence (if appropriate) shall be made/collected in order to make the following determinations:

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

i. Does the problem involve the Smoke Management Plan (prescribed burning of forest fuels on forestland)?

ii. Are there any violations? (If so, follow proper enforcement procedures.)

iii. What may be done to correct the problem?

iv. What actions may be taken to prevent recurrence of the impact?

4. Follow-up: After the investigation is completed, and with the approval of the District Forester on the findings and any necessary follow-up action, complainants who requested investigation information should be contacted and informed of the findings and follow-up action.

5. Reports: A written complaint investigation report or intrusion report as appropriate must be made for all complaints received. For most complaints, use the complaint form in Appendix 2~~, page 8~~. This form will be sufficient if it contains the minimum information listed above.

   For complaints involving violations, or for which evidence has been collected, an expanded investigation report containing pictures, correspondence, and/or other data may be appropriate.

   A file of these reports shall be maintained at the district. Copies must be sent to the area office, Salem Smoke Management unit, and other agencies involved in the complaint. A summary of complaints will be made available to the Smoke Management Advisory Committee when requested.

J. SSRA Listing Evaluation Procedures: OAR 629-048-0150 establishes criteria for evaluating proposed listing of areas as SSRAs. Using these criteria, an evaluation of a recommendation must be made for consideration by the Board of Forestry. Analysis shall be conducted with the assistance of DEQ air quality staff. This evaluation will consider:

1. Review of prior smoke incidents. Reports of incident investigations will be used to quantify the ~~length~~duration, ~~severity~~magnitude, and frequency of impact from forestland prescribed burning.

   a. The cause(s) of the impacts to determine the likelihood of similar events in the future. Consider the potential of repeated or long-lasting impacts.

   b. The results of objective measurements, monitoring, or study efforts.

   c. Burning programs/plans for areas that could drift smoke into the area.

   d. Geographic factors that would tend to funnel smoke into the area.

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

e. Population and trends for population growth within the community under consideration.

f. Impact on prescribed burning programs in the surrounding area.

g. Probability of the area exceeding National Ambient Air Quality Standards due to potential prescribed burning smoke impacts.

h. Consideration for other air quality improvement projects ongoing or planned for the area.

i. Analysis of complaints received, community or governing agency concerns, and recommendations for addition of the area.

Once the evaluation is complete, a report of the results of the analysis must be prepared and a joint recommendation of ODF and DEQ must be submitted to the Board of Forestry. In the event an agreement cannot be achieved between the two departments, ODF will include an explanation of the lack of agreement in the recommendation.

K. Communication, Community Response Plans, and Exemption Requests: With increased potential for smoke impacts into SSRAs and other smoke sensitive areas, OAR 629-048-0180 outlines a communication framework to inform vulnerable SSRAs about the impact of prescribed burning smoke and how a community can know when they may be impacted by it. These communities will be encouraged to develop a response plan and program to notify their citizens of potential smoke impacts and how they can reduce their exposure.

1. ODF Salem headquarters will develop and distribute a communication framework that will include at least:

a. The purpose and importance of prescribed burning,

b. The health risks of wildfire and prescribed fire smoke,

c. Recommendations for the public and vulnerable populations to reduce their exposure to smoke,

d. How local officials and the public can find out about current and upcoming prescribed burns planned in their area, and

e. How residents of an SSRA and other interested persons can get up-to-date information about anticipated smoke impacts in specific SSRAs.

2. ODF and DEQ will recommend SSRAs that have experienced repeated smoke incidents and/or intrusions collaboratively develop a community response plan and program. This should be led by the local public health authority, in coordination

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

with members or representatives of vulnerable populations, community officials, representatives from entities that have responsibility for prescribed fire, forest restoration collaborative groups, local businesses, and other interested members of the public. Information in the plan and program should include, but is not limited to the following:

a. A description of populations in an SSRA community that are vulnerable to the health effects of short-term smoke;

b. 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;

c. Adequate options for protecting the health of vulnerable populations (or helping such populations to protect themselves) from short-term exposure to smoke; and

d. 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.

2.3. SSRA communities that develop a community response plan and program may request an exemption to the one-hour average smoke intrusion threshold through their local governing body and County Commission. The request for exemption will be considered for approval by ODF and DEQ under the advisement of Oregon Health Authority (see OAR 629-048-0180 for the complete exemption process).

K.L. Quantification of Forest Residues: Consistent evaluation of the fuel available and consumed in each prescribed burn is important for estimating the emissions produced during the burn. Accurate pre-burn quantification of material is essential in minimizing errors in the emissions estimates.

1. The fuel consumed by a prescribed burn is calculated by:

a. Determining total pre-burn fuel tonnage load.

b. Determining average pre-burn duff depth, litter depth and type.

c. Computing woody fuel consumption using available tools developed to predict woody fuel consumption.

d. Calculating and adding duff and litter consumption.

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

2. Estimation of the total pre-burn fuel tonnage should be through the application of the "planar transect methods" of inventorying forest residue such as the Brown's inventory method, by use of "Photo Series for Quantifying Forest Residue," or through supplemental photographs developed for specific areas and fuel types. Only if the preceding methods cannot be used should other estimation procedures be employed.

   a. Instructions for the actual measurement of fuels are contained in the "Handbook for Inventorying Downed and Woody Material," U.S.D.A. Forest Service General Technical Report INT-16, 24p, Intermountain Forest and Range Experiment Station, Ogden, Utah. Instructions for the ODF fuel-loading technique can be found on the Oregon Smoke Management website: http://smkmgt.com/weather/tools/fuel_loading/fuel_loading_tool_1.php

   b. Digital Photo Series and other estimation aids may be accessed through ODF Smoke Management web pages. ~~Some photo series are available in hard copy form through the Smoke Management unit.~~

   c. Instructions for fuels inventory and consumption procedures are available via the Internet or from the ODF Smoke Management unit.

3. For units that have already been piled, one of the three following methods should be used:

   ~~a. Ocular estimate of pile volumes in which the size and number of piles to be burned is estimated through visual techniques where irregular and differing pile types are "smoothed" to an overall size and shape of pile. Estimate of the total amount of material to be burned is then calculated through one of the approved procedures or computer applications.~~

   ~~b.~~a. Statistical sample of pile volume is the preferred method. In the statistical sampling method, a randomly selected group of piles is measured and the corresponding pile type is assigned to each sampled pile (Appendix 2). Species of the debris in the piles is determined and calculation of the total material is made through the ~~application of Pile Calculation of Slash Tonnage (PCOST)~~ Piled Fuels Biomass Emissions web application (https://depts.washington.edu/nwfire/piles/), BlueSky Playground, Consume, or through manual calculations.

   b. Aerial photo interpretation may be used when large-scale aerial photographs of slash piles in harvested units can be evaluated to determine dimensions and volumes. References for application of this technique may be obtained via the Internet or the Pacific Northwest Research Station.

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

USFS.

c. Ocular estimate of pile volumes in which the size and number of piles to be burned is estimated through visual techniques where irregular and differing pile types are "smoothed" to an overall size and shape of pile. Estimate of the total amount of material to be burned is then calculated through one of the approved procedures or computer applications.

4. Consumption of material during the burn is estimated using the same tools as for pre-burn fuel loading or through the use of consumption calculation software applications. Post-burn fuel loading may be estimated using measurement samples or reapplication of the photo series. Additionally, the ODF fuel-loading calculator (http://smkmgt.com/weather/tools/fuel_loading/fuel_loading_tool_home.html), the BlueSky Playground (https://playground.airfire.org), or USFS Consume application to estimate fuels consumed during the prescribed burn may be used. These may be obtained on the Internet and are also available from the Smoke Management unit.

RESPONSIBILITIES:

A. Fire Protection Division Chief: The Fire Protection Division Chief is responsible for the coordination of the Smoke Management Plan with cooperating agencies and state and regional air quality authorities.

B. Fire Protection Division: The Smoke Management unit is responsible for the day to day operation of the Smoke Management program, including:

1. Issuing Smoke Management forecasts and instructions. Forecasts and instructions shall be issued daily during periods of substantial burning (normally March through June and ~~mid~~ late September through ~~November~~December). These forecasts are monitored and updated as necessary. When routine written instructions are not being prepared, meteorologists shall coordinate and approve prescribed burns on a case by case basis.

2. Maintaining the Smoke Management data system. All forestland burning shall be entered into the data system in accordance with the instructions in Appendix 1.

3. Coordinating with field administrators and identifying and conducting necessary training.

4. Monitoring the Smoke Management program and providing required summary reports and information to interested parties. Smoke Management unit personnel will prepare reports summarizing annual forestland prescribed burning activities,

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

pertinent emissions information, and summaries of audits and smoke incidents.

C. Area Directors, District Foresters, and Unit Foresters are responsible for ensuring that the provisions of this directive are met and that prescribed burning activities are conducted within the requirements of the Smoke Management rules.

D. Field Administrators: ODF and federal land management agency field administrators oversee prescribed burning in accordance with the Smoke Management rules, this directive, and daily Smoke Management instructions.

Federal land managers are required by the federal Clean Air Act to follow the directions of the forester for the protection of air quality in their prescribed burning operations.

E. Burn Bosses: Forest landowners/operators are responsible to conduct forestland prescribed burning according to the Oregon Smoke Management Plan, requirements of field administrators and the instructions issued by the forester.

REVIEW: The Smoke Management directive shall be reviewed according to OAR 629-048-0450(5). The review will be conducted jointly by the State Forester and the Director of Environmental Quality and will include representatives of affected agencies and parties.

AGREEMENT:

In witness whereof, the parties have agreed to the standards and procedures set forth in this directive.

State of Oregon Department of Forestry		State of Oregon Department of Environmental Quality	
By:	_____	By:	_____
Title:	_____	Title:	_____
Date:	_____	Date:	_____
	_____		_____

REPORTING SYSTEM
SMOKE MANAGEMENT PLAN

General: ODF maintains a computer database to record and administer Smoke Management data. State and private Smoke Management data is entered by field offices into the database via the ODF network. Federal data is collected and consolidated at the USFS regional office and transferred electronically to ODF.

The reporting system is designed to provide a record of:

A. Forestland scheduled for prescribed burning.

B. Locations and amounts of daily planned burning.

C. Burning that has been accomplished.

D. Fee collection and administration information.

E. Historical data for calculation of emission estimates and other summaries.

Area Included: Reporting is required throughout the state. The procedures and requirements for frequency of reporting in different areas of the state are identified below. Data are grouped by administrative units, i.e., national forests, Bureau of Land Management districts, ~~national parks~~other federal lands, private ownership, and state ~~forest protection districts~~or local governmental jurisdictions.

Types of Burning to be Reported: All burning related to forest management activities should be included in the reporting system, except as noted below. Examples of reported data include slash and brush disposal after logging, road building, scarification, or burning of brush fields for reforestation.

Types of Burning That Should Not be Included: The following types of burning are not under the authority of the Smoke Management Plan and should not be entered into the Smoke Management data system:

- Burning of household or yard maintenance debris such as paper, leaves, lumber, etc.
- Burning related to agricultural practices, including Christmas tree growing, orchard pruning, and grass or grain stubble burning.
- Burning related to demolition, home or other construction, and building site preparation.
- Any burning done in conjunction with a land use change.

Frequency of Reporting: All burns must be entered into the data system prior to ignition. Detailed procedures for this registration begin atare highlighted later in this Appendix 1, page 8**.** In areas subject to Level 1 regulation, all planned and accomplished burning is entered into the computer data system on a daily basis. Planned burns shall be entered by the day of the burn and accomplishments are reported on the next working business day after the unit is burned. In areas of Level 2 regulation, planning burns in the data system is not required and, although daily reporting is encouraged, accomplishments are required to be reported no later than the first working business day of the week following the burn.

Procedures:

A. For private, and local and state government burning:

1. A unit registration is entered into the computer data system for each burn unit. Information to be entered is contained in Reporting System Coding Sheet (Part 1, Form 1-4-1-501). These data are entered into the computer data system at the local ODF field office. The ODF Forest Practices Forest Activities Computer Tracking System (FACTS)E-notification number, obtained through the local ODF office, will be used for tracking burn units for all landowners. For Level 1 regulated lands, registration is to be completed at least seven days prior to a planned ignition. Districts may waive the seven-day requirement in accordance with OAR 629-048-0300(2) but all units must be registered prior to burning.

2. Prior to 10 a.m. the day of the ignition, unit numbers of planned burns in Level 1 regulated areas are entered into the data system by field offices. Part 2, Form 1-4-1-501 is used to assemble the information needed to plan a burn. A listing of planned burns is then compiled and made available to all interested parties. Right-of-way burns need not be planned on a daily basis.

3. An accomplishment report for each burn is submitted by field offices the day after burning, using Part 3, Form 1-4-1-501. Burning on Level 2 regulated lands must be entered into the data system no later than the first working business day of the week following the burn. The accomplishments are posted as in 2. above.

4. Right-of-way burns shall be registered as per step one, above. Right-of-way burns do not have to be planned prior to burning. Accomplishments are reported in accordance with paragraph 3. above.

B. For federal agency forestland burning:

1. Information required for registration is the same as for non-federal burning but units are entered into a the FASTRAX data system developed for use by the federal agencies. The primary unit identifier shall be the FACTS E-notification number, obtained through the local ODF office, or a non-activity "406" number obtained through the Salem headquarters office. Part 1, Form 1-4-1-501 may be used to help assemble all required data. In order to ensure unit information is transferred without error to the Smoke Management database, registration must be completed at least 7 days prior to the planned ignition. This may be waived by the State Forester in specific instances to meet agency needs but all units must be registered prior to burning.

2. Units to be burned the next day shall be planned through the federal data systemFASTRAX by the day of the burning. Part 2, Form 1-4-1-501 may be used to gather the information needed to plan a burn.

3. Burning results for all federal burning shall be reported through the federal data systemFASTRAX the first business day following the burn. Part 3, Form 1-4-1-105 is available to help collect data for accomplishment reporting.

4. Smoke Management data for federal agencies is consolidated by USFS, Region 6 and is then transmitted electronically to ODF. After this data has been input into the Smoke Management data system, reports of errors and other information is sent back to the USFS to verify receipt of the information and facilitate error correction.

5. To facilitate collection of rangeland burning emissions, data for this burning may be entered into the data system as outlined above, using code "s" as the burn type.

Forms: The following forms below shall be used to gather Smoke Management information for entry into the data system. These forms are available in electronic format on the Smoke Management Internet pages. Locally generated forms are not alloweddiscouraged unless approved by the Smoke Management unit manager.

~~OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM~~

[YNJ1]

OREGON SMOKE MANAGEMENT REPORTING SYSTEM CODING SHEET PART ONE, PAGE 1

AGENCY:______________________**(VID)**______________ FOREST/DISTRICT:____________________________

Date entered (optional)	Unit Number (FACTS #)	District/ Forest ID	Owner Name (optional)	Ownership	FPF No. (Opt)	Sale Name (optional)	Sale Unit No. (optional)	Township	Range	Sec.	County No.	Distance from SSRA	SPZ
	1	2	3	4	5	6	7	8	9	10	11	12	13
	xxxxxxxxxxxx	xxx	xxxxxxxxxxxxxxxxxxxx	x	xxx	xxxxxxxxxxxxxxxxxxxx	xxx	xxxx	xxxx	xx	xx	xx	x

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

OREGON SMOKE MANAGEMENT REPORTING SYSTEM CODING SHEET PART ONE, PAGE 2

* Not required for pile burns. Zero "0" may be entered.

Acres in Unit	Cutting Date	Harvest Diameter	Elev.	Slope % *	Duff Depth *	Type of Burn	Species of Fuel	Method Fuel Load	Landing or R/W Acres	Landing & R/W Pile Tons	Other Acres	Piled Tons	0-¼" Fuel per Acre *	¼-1" Fuel per Acre *	1-3" Fuel per Acre *	3-9" Fuel per Acre *	9-20" Fuel per Acre *	20+" Fuel per Acre *	Reason for Burn
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
xxxx	xxxx	x	xxxxx	xxx	xxx	x	x	xx	xxxx	xxxxx	xxxx	xxxxx	xx	xx	xx	xx	xxx	xxx	x

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

OREGON SMOKE REGISTRATION PART 1:

UNIT IDENTIFICATION:	**Unit 1:**	**Unit 2:**	**Unit 3:**	**Unit 4:**	**Unit 5:**
DATE REGISTERED:					
REGISTRATION #:					
DISTRICT ID:					
OWNERSHIP CODE:					
SALE NAME:					
UNIT INFORMATION:					
TOWNSHIP:					
RANGE:					
SECTION:					
LATITUDE:					
LONGITUDE:					
COUNTY:					
DISTANCE TO SSRA:					
UNIT ACRES:					
CUTTING DATE:					
ELEVATION:					
SLOPE:					
BURN TYPE:					
BURN REASON:					
TREATMENT SUMMARY:					
OPERATOR NAME:					
FUEL SPECIEIS:					
LANDING R/W ACRES:					
LANDING R/W TONS:					
PILE ACRES:					
PILE TONS:					
BROADCAST ACRES:					
DUFF DEPTH:					
FUEL TONS PER ACRE (SOUND):					
0 - 1/4"					
1/4 - 1"					
1 - 3"					
3 - 9"					
9 - 20"					
20+ "					

[YNJ3]

LITTER TYPE:					
LITTER DEPTH:					
LITTER % COVERAGE:					

FUEL TONS PER ACRE (ROTTEN):

3 - 9"					
9 - 20"					
20+ "					

ROTTON STUMPS:

DIAMETER:					
HEIGHT:					
DENSITY:					

LIVE FUELS:

SHRUB TYPE:					
SHRUB % COVERED:					
SHRUB HEIGHT:					
TONS PER ACRE:					

COMMENTS:

BILLING INFORMATION:

Vendor ID:	
First Name:	
Last Name:	
Business Name:	
Address 1:	
Address 2:	
City:	
State:	
Zip:	
Phone:	
Suspended:	

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM[YNJ4]

OREGON SMOKE MANAGEMENT
REPORTING SYSTEM CODING SHEET
Part 2 and Part 3, Page 1

AGENCY:_____________________________ **FOREST/DISTRICT:**_____________________________

PART 2	PLANNED BURNS								PART 3 ACCOMPLISHMENT REPORT							
Date entered (optional)	Unit Number (FACTS #)	District/ Forest ID	Planned Date	Est. Ignition Time	Acres Planned	Landing Pile Tons	Unit Pile Tons	Bcst/ Underburn **Tons/Acre**	Unit Number (FACTS #)	District/ Forest ID	Date of Burn	Ignition Time	Landing /R-O-W Acres Burned	Landing or R/W Tons Burned	Other Acres Burned	Unit Pile Tons Burned
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
	xxxxxxxxxxxx	xxx	xxxxxx	xxxx	xxxx	xxxxx	xxxxx	xxx	xxxxxxxxxxxx	xxx	xxxxxx	xxxx	xxxx	xxxxx	xxxx	xxxxx

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

[YNJ5]

OREGON SMOKE MANAGEMENT REPORTING SYSTEM CODING SHEET
Part 3(cont.), Page 2

Enter for Broadcast and Underburn Only														
Bcst/Ubrn Tons per Acre Burned	Ignition Dur.	Ignition Method	Rapid Ignition (Y/N)	WX Station Used	10-Hr Fuel Moist	1000-Hr Fuel Moist	1000-Hr Moist Method	Number Days Since Sig. Rain	Air Temp	Rel. Humidity	Wind Dir.	Wind Speed (mph)	Snow off Month	Remarks (optional)
9	10	11	12	13	14	15	16	17	18	19	20	21	22	(Not entered in data system)
xxx	xxx	x	x	xxxx	xx	xx	x	xxx	xxx	xxx	xx	xx	xx	

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM[YNJ6]

OREGON SMOKE REGISTRATION - PLANS (Part 2)

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Planned Date:					
Planned Time:					
Acres Planned:					
Landing R/W Tons Planned:					
Pile Tons Planned:					
Broadcast Tons/Acres Planned:					

OREGON SMOKE REGISTRATION - ACCOMPLISHMENTS (Part 3)

Actual Burn Date:					
Actual Burn Ignition Time:					
Acres Burned:					
Landing R/W Tons Burned:					
Pile Tons Burned:					
Broadcast Tons/Acres Burned:					

Achieved Rapid Ignition:					
Shrub Consumption:					
Duff Fuel Moisture:					
Fuel Moisture 10 HR %:					
Fuel Moisture 100 HR %:					
Fuel Moisture 1000 HR Code:					
Days Since Significant Rain:					
Wind Speed:					

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

Alternative Smoke Management Registration (Part 1 of 3)

Fee payer Name:		☐ **Operator**	☐ **Landowner**
Billing Address	**Street:**		
	City:	**State:**	**Zip Code:**
Phone Number:		**Signature:**	
Operator Name (*if different than fee payer*)**:**			
Date Register:		**District ID:**	
Registration #		(12 digit, including unit, YY-DDU-NNNNN-UU)	
Ownership Type: ☐ **Private (P)** ☐ **Fed-Not FS (O)** ☐ **R6 Fed (F)** ☐ **USFS (U)** ☐ **State, County, City (S)**			
Sale/Unit Name:			
Legal Location: TWN	**S** **RNG** **W** **SEC**	**County:**	**Distance to SSRA:**
Latitude (DD.DDDD) Decimal Degrees only:			
Longitude (-DDD.DDDD) Decimal Degrees Only, **must include the " – ":**			
Total Unit Acres:	*(Total acres the material you're burning came from.)*	**Date 70% Felled** (m/y):	
Elevation:		**Avg. Slope:%**	

Type of burn: *(Check Only 1)*	☐(B) Broadcast Activity ☐(F) Broadcast Natural	☐(G) Grapple Pile ☐(H) Hand Pile	☐(U) Underburn Activity ☐(N) Underburn Natural	☐(L) Landing Piles Only* ☐(T) Tractor Pile	☐(R) R/W ☐(S) Range

**If unit has landing piles in addition to another type of burn, DO NOT check Landing Piles Only, check the box that pertains to the majority of your unit, and enter the Landing pile tons in the space below.*

Burn Reason: *(Check Only 1)*	☐(H) Hazard Reduction ☐(B) Hazard & Silviculture	☐(W) Wildlife Habitat ☐(S) Silviculture	☐(F) Forest Health ☐(R) Other	☐(M) Forest Health Maint. ☐(E) Lvl. 2 Reg., Fee Exempt
Species: *Only 1*	☐(D) Douglas Fir/Hemlock/Cedar ☐(S) Sage/Bitterbrush	☐(H) Hardwood ☐(G) Grass	☐(M) Mixed Conifer ☐(P) Ponderosa	☐(B) Brush ☐(L) Lodgepole

Landing R/W Ac:		**Landing R/W Tons:**		**Piled Ac:**		**Piled Tons:**	
Broad/Under Burn Ac:		**Duff Depth:**					

Fuel Tonnage:	Tons/Acre (0-.25")		Tons/Acre (.26-1")		Tons/Acre (1.1-3")	
Acres:	Tons/Acre (3.1-9")		Tons/Acre (9.1-20")		Tons/Ac. (20.1"+)	

Forest Floor Litter Type:

☐ Short Needle Pine	☐ Long Needle Pine	☐ Other Conifer	☐ Deciduous Hardwood	☐ Evergreen Hardwood	☐ Grass
Litter Depth (i.e. 1.3")			Litter coverage on ground (%)		

Rotten Stumps: (Average Diameter, Height, and Density or amount per acre.)

3-9"	Diameter: Height: Density:		9-20"	Diameter: Height: Density:		20+"	Diameter: Height: Density:
Live Shrub Type & Cover %:		**Live Shrub Height:**		**Live Shrub Tons per Ac:**			

Comments: THIS IS NOT A BURNING PERMIT. (All units must be registered a minimum of 7 days before burning, earlier is preferred.)

[YNJ7]

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

Alternative Burn Plan (Registration Part 2)

Operator: **Phone:**

Planned Date of Burn: **Planned Ignition Time:**

Acres Planned: **Landing – R/W Tons Planned:** **Pile Tons Planned:**

Broadcast Tons/AC Planned:

Special Problems and Mitigation Instructions:

Personnel:

Equipment:

Other:

Mop-up and patrol is required to prevent the spread of fire from the planned unit. Mop-up and patrol will be provided by the landowner or operator until the danger of fire spreading is over. Sufficient contingency force must be provided by the landowner or operator to ensure control of this burn during periods of adverse weather conditions.

Pursuant to ORS 477.066, 067, 068, and 120 the Landowner and Operator identified on this plan shall immediately proceed to control and extinguish any uncontrolled fire escaping the planned burn area and be liable for up to $300,000 of the Forester's fire suppression costs. In case the Landowner or Operator fails to perform the duty required, or is willful, malicious, or negligent in the fire origin, or subsequent spread, or fails to make every reasonable effort, the actual costs incurred by the Forester, or a Forest Protection Association in controlling and extinguishing the fire shall be paid by the Landowner or Operator.

Signature of Operator: _____ **Date:** _____

Signature of ODF Forester: _____ **Date:** _____

Attach a map of the unit which shows: 1) access routes, 2) unit boundaries, 3) water sources, 4) problem areas, 5) control lines, 6) adjacent fuels, 7) adjacent landowners.

All burns a minimum of $30. Registration Fee = $0.50/ac. Landing Burns (total harvest ac.) = $0.50/ac.
Broadcast/Underburn (Actual Acreage of Burn Area) = $2.60/ac. with landings; $3.10/ac. without landings.
Piled burn (Actual Acreage of Burn Area) = $2.60/ac. with landings; $3.10/ac without landings.

FOR OFFICE USE ONLY

Stewardship Forester: _____ **Notes:** _____

District ID: _____ _____

OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

Alternative Accomplishment Section, (Registration Part 3)

Operator Name:	**Phone:**	
Unit Name:	**Registration #:**	
Actual Burn Date:	**Actual Ignition Time:**	
Actual Acres Burned:	**Landing-R/W Tons Burned:**	
Pile Tons Burned:	**Broadcast Tons/Ac. Burned:**	
Total Broadcast Tons Burned:	**Total Tons Burned:**	
Ignition Duration:	**Achieved Rapid Consumption:**	**Shrub Consumption:**
Duff Fuel Moisture:	**Fuel Moisture 10Hr%**	**1000Hr%**
Fuel Moisture Code:	◯ **NFDR-th** (1000hr moisture from NFDRS model) ◯ **Adj-thj** (user adjusted moistures) ◯ **Weighted** (oven weighted samples)	
Days Since Significant Rain:	**Wind Speed:**	
Additional Comments:		

[YNJ9]

INSTRUCTIONS FOR
DATA FORM 1-4-1-501REPORTING SYSTEM CODING SHEET FOR SMOKE MANAGEMENT

Unless otherwise specified, data shown in quotation marks (" ") should be entered without the quotation marks. All entries are mandatory unless indicated otherwise. Entries consist of only numbers or letters. No special characters such as dashes, commas, etc. may be used.

PART ONE1: BASIC UNITREGISTRATION INFORMATION

1. **Date registered:** Enter the day of registration in MM/DD/YY format.

12. **Unit Registration Numbernumber:** Twelve digits, the ten (10) digit FACTS E-notification number obtained through the Forest Practices program plus a two (2) digit unit extension that can come from either the FACTS E-notification system or can be generated locally. Enter data as one, twelve-digit number with no spaces, dashes, or other characters. For natural, "non-activity" units without FACTS E-notification numbers, contact the Salem Smoke Management unit. Blocks of 100 "406" numbers will be issued to local offices for conducting these burns. Units should not be re-registered using a different number during the three-year burning window available under the original registration.

23. **District or Forest Identifier:** A three-digit code as shown in the table, "Smoke Management District ID Numbers" on page 17 oflater in this Appendix 1.

3. **Owner name (optional entry):** Up to 20 characters, letters, and numbers only with no punctuation.

4. **Ownership type:**

USFS - blankU	Federal (except USFSBLM) - F
Other Federal – O	State, County, Municipal – S
Private - P	

5. **FPF number (Optional entry):** Up to three characters

65. **Sale name (Optional entry):** Up to 20 characters, letters, and numbers only with no punctuation.

7. **Sale unit number (Optional entry):** Up to three characters

INSTRUCTIONS FOR
~~DATA FORM 1-4-1-501 FOR SMOKE MANAGEMENT~~REPORTING SYSTEM CODING SHEET

PART 1: BASIC UNIT INFORMATION (Cont.)

~~8~~6-~~10~~8. **Legal:** Enter location by township, range, and section, but do not include the letters "T", "R", and "S". Partial townships may be entered. "1/4, 1/2, and 3/4" partials should be entered in decimal format as "2, 5, or 7", respectively after the full township or range. ~~Note that a three-digit entry needs to be made for township and range, with an implied decimal between the second and third digit.~~ If the unit covers more than one section, enter the predominant section number.

~~8~~6. Township

~~9~~7. Range

~~10~~8. Section

Examples:

	Field Number		
	10	11	12
T10S-R10W-S33	10~~0~~S	10~~0~~W	33
T10 1/2S-R11E-S25	10.5S	11~~0~~E	25
T9 3/4S-R7 1/2E-S6	~~0~~9.7S	~~0~~7.5E	6

9. **Latitude:** Use decimal degrees only. Enter two digits to left of decimal and four digits to the right of the decimal.

10. **Longitude:** Use decimal degrees only. Enter a "-" sign and three digits to the left of the decimal and four digits to the right of the decimal.

11. **County Number:**

01	Baker	10	Douglas	19	Lake	28	Sherman
02	Benton	11	Gilliam	20	Lane	29	Tillamook
03	Clackamas	12	Grant	21	Lincoln	30	Umatilla
04	Clatsop	13	Harney	22	Linn	31	Union
05	Columbia	14	Hood River	23	Malheur	32	Wallowa
06	Coos	15	Jackson	24	Marion	33	Wasco
07	Crook	16	Jefferson	25	Morrow	34	Washington
08	Curry	17	Josephine	26	Multnomah	35	Wheeler
09	Deschutes	18	Klamath	27	Polk	36	Yamhill

12. **Distance from nearest Smoke Sensitive Receptor Area (SSRA) boundary:** Round to nearest mile. If within SSRA, use 0. If more than 60 miles, enter "60".

INSTRUCTIONS FOR
~~DATA FORM 1-4-1-501 FOR SMOKE MANAGEMENT~~RECORDING SYSTEM CODING SHEET

PART 1: BASIC UNIT INFORMATION (Cont.)

~~13. **Special Protection Zone (SPZ):** Enter SPZ that includes burn unit:~~

~~Medford - M Oakridge - R Klamath Falls - K Lakeview - V~~

~~None – N~~

~~14~~13. **Acres in unit:** Enter the total number of acres in the unit. Acreage for individual treatment types will be broken out in data fields ~~23~~ 21 ~~and~~ through ~~25~~26, below.

~~15~~14. **Date when 70% of the cutting was completed:** Enter the ~~four~~six-digit code ~~"mmyy"~~ "yyyy-mm", e.g. ~~"1209"~~"2009-12" means that December 2009 was the cutting date. ~~Enter "9999"~~Leave blank for natural fuels or no cutting.

~~16. **Minimum harvest log diameter:**~~

~~Harvest Specification~~	~~Entry Code~~
~~Less than 4" or whole tree yarding~~	~~"2"~~
~~4 inches~~	~~"4"~~
~~6 inches~~	~~"6"~~
~~8 inches~~	~~"8"~~
~~Other~~	~~"9"~~
~~Not Applicable~~	~~"1"~~

~~17~~15. **Elevation of burn:** Elevation of burn above sea level in feet. Enter average elevation to the nearest 100 feet.

~~18~~16. **Slope:** Enter actual average slope. Maximum of three digits, do not enter % symbol.

Example: 30% slope is entered as "30".

~~19. **Average duff depth:** Report to the nearest tenth of an inch. Do not include the decimal when reporting. Example: 1.6 inches of duff should be reported as "16".~~

INSTRUCTIONS FOR
DATA FORM 1-4-1-501 FOR SMOKE MANAGEMENTREPORTING SYSTEM CODING SHEET

PART 1: BASIC UNIT INFORMATION (Cont.)

2017. **Type of burn:** Enter the predominate type of burning. Do not enter "L" for units that are a combination of landings and other burn types.

Broadcast Activity - B	Underburn Activity - U
Broadcast Natural - F	Underburn Natural - N
Handpile - H	Grapple Pile - G
Tractor Pile - T	Landing Only - L
Right-of-way – R	Rangeland – S

18. **Primary reason for burn:**

Hazard Reduction - H	Silviculture - S	Forest Health - F
Wildlife Habitat - W	Hazard and Silviculture - B	Other - R
Forest Health, Maintenance – M	Level 2 regulation, Fee Exempt – E	

19. **Operator Name:** Individual or business conducting the burn (optional entry).

2120. **Predominant species of fuel:**

Douglas Fir, Hemlock, Cedar - D	Ponderosa Pine - P
Lodgepole Pine - L	Mixed Conifer - M
Hardwood - H	Brush - B
Juniper - J	Grass - G
Sagebrush or Bitterbrush – S	

~~22. **Method for determining fuel loading:**~~

~~For broadcast and underburns:~~

~~Transect - T~~	~~Photo Series:~~	~~PNW51 - P1~~
~~Other Method - M~~		~~PNW52 - P2~~
		~~PNW231- P3~~
		~~PNW258- P4~~
		~~Local - L~~

~~For pile burns: The following codes may also be used:~~

~~Aerial photo - A Random Sample - R Ocular - C~~

~~23~~21. **Landing or right-of-way pile acres:** Enter the total number of acres from which the material was collected. If less than 1, report as 1. Include all landing acreage for the unit.

INSTRUCTIONS FOR
~~DATA FORM 1-4-1-501 FOR SMOKE MANAGEMENT~~REPORTING SYSTEM CODING SHEET

PART 1: BASIC UNIT INFORMATION (Cont.)

~~24~~22. **Landing and right-of-way pile ~~tons~~acres:** Enter the total ~~tons~~ acres of material contained within all landing (and right-of-way) piles that will be burned. Do not include broadcast woody loading or in-unit piles in this entry (See item ~~26~~28-~~30~~33). ~~Duff loading should not be reported here.~~ Leave blank if there are none. Note: Landing/right-of-way and in-unit piles must be registered separately to facilitate fee assessment.

23. **Landing and right-of-way pile tons:** Enter the total tons of material contained within all landing (and right-of-way) piles that will be burned. Do not include broadcast woody loading or in-unit piles in this entry. Leave blank if there are none.

~~25~~24. **~~Other~~ Piled acres:** Enter the number of acres ~~to~~ expected to be burned as ~~broadcast,~~ in unit piles~~, underburn, or other non-landing/right-of-way type of burning~~. Leave blank if there are none.

~~26~~25. **Piled tons:** For piled burns, and piles (other than landing or right-of-way piles) on broadcast and underburn units, enter the pile tonnage~~, in total tons~~ expected to be burned~~,~~ in the unit. ~~Enter "0"~~Leave blank if there are none.

26. **Broadcast acres:** Enter acres of broadcast or underburning expected to be burned. Leave blank if there are none.

27. **Average duff depth:** Report to the nearest tenth of an inch. Do not include the decimal when reporting. Example: 1.6 inches of duff should be reported as "16".

~~27~~28-~~32~~33. **Woody loading in broadcast and underburns:** Reported as tons per acre by size class. ~~Do not include duff loading here; duff is entered in field 19. Do not include material in piles; that information should be reported in items 24 and 26.~~ For natural fuels burns, include all fuel types in the appropriate size classes. Round all data to the nearest ton/acre.

~~27~~28. 0 - 0.25" loading

~~28~~29. 0.26 - 1.00" loading

~~29~~30. 1.1 - 3.00" loading

~~30~~31. 3.1 - 9.00" loading

~~31~~32. 9.1 - 20.00" loading

~~32~~33. >20" loading

~~33. **Primary reason for burn:**~~

INSTRUCTIONS FOR REPORTING SYTEM CODING SHEET

~~Hazard Reduction – H Silviculture – S Forest Health – F~~

~~Wildlife Habitat – W Hazard and Silviculture – B Other – R~~

~~Forest Health, Maintenance – M Level 2 regulation, Fee Exempt – E~~

34-36. **Forest floor fuel (optional entry):**

34. Litter type: Choose one of the following:

Short needle pine

Long needle pine

Other conifer

Deciduous hardwood

Evergreen hardwood

Grass

35. Litter depth: Record in 10ths of inch.

36. Litter coverage percent: Percentage coverage for entire unit.

37-39. **Rotten fuel tons per acre (optional entry):** Reported as tons per acres by size class.

37. 3 – 9” loading

38. 9 – 20” loading

39. >20” loading

40-42. **Rotten stumps (optional entry):** Report diameter in inches, height in feet (use decimal value for a partial foot), and density number of stumps per acre.

40. Diameter

41. Height

42. Density

43-46. **Live fuels (optional entry):**

43. Shrub type: Choose one of the following.

Broadleaf

Evergreen

Sage

44. Shrub percent coverage: Coverage over entire unit

45. Shrub height: In tenths of feet

46. Tons per acre: shrubs consumed by burning

47. **Comments (optional entry):**

INSTRUCTIONS FOR
~~DATA FORM 1-4-1-501 FOR SMOKE MANAGEMENT~~REPORTING SYSTEM CODING SHEET

PART 2: PLANNED BURN

The following information shall be entered into the computer by the day the unit is planned for burning for all districts and forests in Level 1 regulation, except for right-of-way piles. Planning of right-of-way piles and areas in Level 2 regulation is encouraged but not required.

1. **Unit number:** The twelve (12) digit number that was entered in Part 1 is entered.

2. **District or forest identifier:** As used in Part 1.

3. **Planned date:** Enter the date the unit is planned to be burned using the format mm/dd/yy.

4. **Estimated ignition time:** Use the 24-hour clock and local time. For example, a planned ignition time of 2:00 p.m. is entered as 1400.

5. **~~Number of acres~~Acres planned:** Enter the number of acres that are planned to be burned. For piled units this is the acres from which the material was gathered.

6-7. **Expected fuel consumption ~~in piles~~:**

   6. **Landing pile tons:** For right-of-way and landing pile units, enter the total tons expected to be burned. ~~Enter "0"~~Leave blank if there are none.

   7. **Unit pile tons:** For piled burns, and piles (other than landing or right-of-way piles) that are planned to be burned on broadcast and underburn units, enter the pile tonnage, in total tons, of woody material ~~predicted~~ expected to be burned. ~~Enter "0"~~Leave blank if there are none.

8. **Expected fuel consumption in broadcast or underburns:** Enter the number of tons of woody fuel, excluding piles~~, and duff predicted~~ and ground fuel expected to be burned in tons per acre.

INSTRUCTIONS FOR
~~DATA FORM 1-4-1-501 FOR SMOKE MANAGEMENT~~REPORTING SYSTEM CODING SHEET

PART 3: ACCOMPLISHED BURN

The following information shall be entered into the computer the next business day after the burning occurred for all districts and forests in Level 1 regulation.

For right-of-way piles and all burning in areas of Level 2 regulation, accomplished burning shall be entered into the data system by close of the first business day of the week following ignition. Daily reporting of accomplishments in Level 2 areas is encouraged.

For landing and piled units only items 1 through 8 need to be reported.

1. **Unit number:** Use the twelve (12) digit number that was entered in Part 1 and Part 2.
2. **District or forest identifier:** As used in Part 1 and Part 2.
3. **Actual date of burn:** Enter the date the unit was burned using the format mm/dd/yy.
4. **Actual ignition time:** Use the 24-hour clock and local time.
5. **Number of landing/right-of-way acres ~~actually~~ burned:** This can be more or less than the number planned. Include slop-over acres in the total. Report only those acres treated by fire, not the total unit size if different. In the event more acres were burned than initially registered and this area was not treated as a wildfire, the additional acreage must be registered and accomplished as a separate unit. Fees shall be applied as appropriate.
6. ~~**Fuel consumed in landing**~~ **Landing or right-of-way ~~piles~~tons burned:** (may be more or less than that entered in Parts 1 and 2): Enter the total tons of material actually burned in the piles.
7. ~~**Other**~~ **Pile acres burned:** Report only those acres treated by fire, not the total unit size if different. This can be more or less than the number planned. Include slop-over acres in the total. In the event more acres were burned than initially registered and this additional area was not treated as a wildfire, the extra acreage must be registered and accomplished as a separate unit. Fees shall be applied as appropriate.
8. ~~**Unit pile**~~ **Pile tons burned:** Enter the pile tonnage, in total tons, of material burned. Do not include landing or right-of-way tonnage in this field.

INSTRUCTIONS FOR
DATA FORM 1-4-1-501 FOR SMOKE MANAGEMENTREPORTING SYSTEM CODING SHEET

PART 3: ACCOMPLISHED BURN (Cont.)

9. **Fuel consumed in broadcast and underburn portion of units:** Enter the amount of woody fuel and duff ground fuel actually burned as tons per acre. This number can be more or less than the entries made in Part 1 and Part 2.

10. **Ignition duration:**

Pile burns - No entry is required.

Broadcast or underburn - Enter the total minutes from the time an ignition device is first used to the time ignition stopped, including any breaks in firing.

Example: If ignition started at 0800, stopped at 0830, then resumed at 0900 and was completed at 1000, the duration would be 120 minutes.

11. **Ignition method:**

Use the following:

Aerial - A Hand - H

Combination of aerial and hand - C Other method - M

NOTE: If one method accounts for 70% or more of the acres ignited, enter that method, not "C".

1210. **Was rapid ignition achieved?**

Enter "Y" or "N", use subjective judgment to answer.

11. **Shrub consumption (optional entry):** Percentage of shrubs consumed in unit.

13. **Weather station:** Used to calculate consumption estimates:

Enter the weather station name. If a weather observation was made on site enter "unit." RAWS may be identified by name or number. For station names longer than four characters, enter only the first four characters, without spaces. For RAWS station numbers, use the last four digits of the station number.

12. **Duff fuel moisture:** Enter either dry (30%), normal (70%), or moist (120%).

1413. **10-hour fuel moisture:** Enter the percentage, rounded to whole numbers. Example: 15.4% fuel moisture should be entered as "15".

1514. **1000-hour fuel moisture:** Enter the percentage without the “%”. Example: 24% fuel moisture should be entered as "24".

INSTRUCTIONS FOR
DATA FORM 1-4-1-501 FOR SMOKE MANAGEMENTREPORTING SYSTEM CODING SHEET

PART 3: ACCOMPLISHED BURN (Cont.)

1615. **1000-hr fuel moisture code:** Method used to determine. Enter a single characterone of the selections below for the method used to determine 1000-hr moisture.

Method	Entry Code
NFDR-th	"N"
Adj-th	"A"
Weighed	"W"

1716. **Number of days since significant rain:** West of the Cascades: Enter the number of days since 0.5 inches of rain have fallen within a 48-hour period.

East of the Cascades: Enter the number of days since 0.25 inches of rain have fallen within a 48-hour period.

18-21. **Unit weather at the time of ignition:** Weather data should be observed and recorded during the ignition period for broadcast and underburn units.

18. Enter temperature (°F)

19. Enter relative humidity (%)

20. Enter surface wind direction (tens of degrees). Note that direction is the direction from which the wind is coming (e.g. a west wind, blowing from 270°, would be entered as "27").

17. **Wind speed:** In miles per hour

21. Enter wind speed (mph).

22. **Snow-off month:** Enter the two-digit code for the month snow left the unit. If there never was snow, enter "00". If there was snow in the unit at the burn time, enter the two-digit month code for the month of the burn.

Example: "03" means snow pack left the unit in March.

SMOKE MANAGEMENT DISTRICT ID NUMBERS

District/Forest	Unit	ID
Astoria		521
Central Oregon		95x
	Fossil	953
	John Day	952
	Monument	956
	Prineville	951
	Sisters	955
	The Dalles	954
Columbia Gorge Scenic Area		220
Coos District		740
Coos FPA		72x
	Bridge	722
	Coos Bay	721
	Gold Beach	723
Deschutes ~~N~~fN.F.		01x
	Bend/Fort Rock	011
	Crescent	012
	Sisters	015
Douglas FPA		73x
	Central Douglas	733
	North Douglas	731
	South Douglas	732
Forest Grove		53x
	Columbia City	532
	Forest Grove	531
Fremont N.F.		02x
	Bly	021
	Lakeview	022
	Paisley	023
	Silver Lake	024
Klamath N.F.	Oak Knoll	301
Klamath-Lake		98x
	Klamath Falls	981
	Lakeview	982
Malheur N.F.		04x
	Blue Mountain	041
	Emigrant Creek	042
	Prairie City	044
Mt Hood N.F.		06x
	Barlow	061
	Clackamas	065
	Hood River	066
	Zig Zag	069
National Park Svc		09x
Crater Lake		090
Oregon Caves		091
North Cascade		58x
	Molalla	581
	Santiam (Linn)	583
	Santiam (Marion)	582
Northeast Oregon		97x
	Baker	972
	La Grande	971
	Pendleton	973
	Wallowa	974
Ochoco N.F.		07x
	Crooked River National Grassland	075
	Lookout Mountain	071
	Paulina	072
Rogue-Siskiyou N.F.		10x
	~~Chetco/~~Gold Beach	103
	~~Galice/Illinois Valley~~Wild Rivers	102
	~~Applegate/Ashland~~Siskiyou Mountains	101
	~~Butte Falls~~High Cascade	106
	Powers	105
Siuslaw N.F.		12x
	Central Coast	128
	Hebo	121
	Oregon Dunes	124
South Cascade		77x
	Eastern Lane	771
	Sweet Home	772
Southwest Oregon		71x
	Central Point	711
	Grants Pass	712
Tillamook		511
Umatilla N.F.		14x
	Heppner	142
	North Fork John Day	145
	Walla Walla	146
Umpqua N.F.		15x
	Cottage Grove	151
	Diamond Lake	153
	North Umpqua	156
	Tiller	152
Walker Range		991
Wallowa-Whitman N.F.		16x
	~~Baker~~	~~161~~
	Eagle Cap	165
	Hell Canyon NRA	164
	La Grande	166
	~~Pine~~	~~167~~
	~~Unity~~	~~169~~
	Wallowa Valley	162
	Whitman	163
West Oregon		55x
	Dallas	552
	Philomath	551
	Toledo	553
Western Lane		781
Willamette N.F.		18x
	Detroit	184
	McKenzie River	187
	Middle Fork	185
	Sweet Home	183
Winema N.F.		20x
	Chemult	201
	Chiloquin	202
	Klamath	203

OREGON SMOKE MANAGEMENT
REPORTING SYSTEM CODING SHEET
RIGHT-OF-WAY UNITS

Agency_____ **Month** _____ **Forest/District** _____

Unit #	DATE BURNED	ACTUAL IGNITION TIME	ACTUAL TONS BURNED	INSTRUCTIONS
1	2	3	4	Data is entered for each day a unit is burned. Example, if a unit was partially burned on 5 different days, there will be 5 entries in the form. 1. Enter 12 digit unit number. 2. Data may be entered for the calendar month but is reported to the data system as required for the level of regulation. 3. Right-of-way burning need not be planned on a daily basis. 4. Ignition time is based on a 24-hour clock, local time. 5. Report total tons burned during each burning period.
xxxxxxxxxxxx	mm/dd/yy	xxxx	xxxxx	

REPORTING SMOKE INTRUSIONS AND SMOKE INCIDENTS

A. Smoke Intrusionintrusion reports/ and the smoke incident reports log provide a descriptive record of smoke impacts into populated SSRAs or other sensitive areas. Smoke Intrusion intrusion reports shall be made for any prescribed burning smoke that enters SSRAs at levels defined as an intrusion. Smoke entering SSRAs at levels below the intrusion threshold or other areas sensitive to smoke shall be identified and reported as smoke incidents. The reports are used to evaluate the causes of impacts and to identify potential areas of improvement in forecasts, instructions, and operational procedures that will prevent minimize future smoke impacts. The iIncident reports log may be useful in an evaluation if the area is recommended for inclusion on the list of SSRAs. Reports shall be summarized in annual analyses of Smoke Management data compiled by the Smoke Management section.

B. Field units, (i.e., state districts and associations, resource areas, or and national forests), are responsible for monitoring smoke from burning activity and reporting smoke impacts intrusions to the Smoke Management Meteorologist. through the use of Form 1-4-1-301. The Meteorologist will determine whether the smoke impact is a smoke incident or a smoke intrusion. If the smoke impact is a smoke incident it will be logged on a smoke incident log detailing the date, time, duration, magnitude, area affected, responsible agency, and any pertinent comments. If the smoke impact is validated as a smoke intrusion the Meteorologist will use Form 1-4-1-301 to detail the impact.Sections A through G must be completed at the local field office, signed by the person completing the form and forwarded to the Salem Smoke Management unit.

C. The Salem Smoke Management unit completes sections H A through M E of the report. The report will be forwarded to the field to complete section F. The field unit will return the completed report back to the Smoke Management unit for dissemination to affected field offices, ODF leadership, DEQ, and the Smoke Management Advisory Committee. In the event that an smoke intrusion incident involves burns conducted in more than one field unit, the Smoke Management unit will combine the individual field reports into a single summary report. Additionally, the Smoke Management unit shall:

1. Prepare and transmit to applicable field offices preliminary reports of smoke intrusions/incidents as soon as they become aware of smoke entering, or about to enter a SSRA at PM levels above the one-hour or 24-hour thresholds.

2. Coordinate with other offices and agencies to develop descriptive reports of smoke incidents and intrusions.

3. Prepare an annual summary of smoke intrusions and smoke incidents. This summary is included in reports of annual Smoke Management activities required by OAR 629-048-0450 and presented to the Smoke Management Advisory Committee as needed.

REPORTING SMOKE INTRUSIONS AND SMOKE INCIDENTS

C. If a smoke intrusion is determined to exceed the National Ambient Air Quality Standards (NAAQS), the Smoke Management Meteorologist will immediately notify DEQ of the impact if DEQ has not already contacted ODF about the intrusion. All other aspects of the intrusion will continue to be processed similar to a smoke intrusion described above. When the intrusion report is complete and disseminated, ODF, DEQ and members of the organization(s) responsible for the burn(s) will meet either by phone or in person to discuss why the exceedance occurred and how it can be prevented in the future. Details of any outcomes to prevent future NAAQS exceedances will be highlighted in the Smoke Management Annual Report.

Procedures:

1. Burn bosses, field administrators, or other forestry personnel shall report suspected smoke ~~incidents~~ impacts into SSRAs, Class I Areas, or areas sensitive to smoke by telephone to the Smoke Management forecaster as soon as possible. If seven-day operations are not in progress at Salem, then telephone by noon on the first ~~workday~~ business day after the ~~incident~~impact.

   Personnel observing smoke entering an SSRA from burn units outside of their administrative area should also submit telephone and written reports as outlined above. In addition, they should notify the field office that has administrative responsibility for the problem unit(s) of the fact that smoke is entering or about to enter a SSRA.

2. An evaluation of the ~~incident~~ impact shall be made by field personnel, time and workload permitting, to determine the extent, ~~intensity~~magnitude, and duration of the smoke impact.

~~3. The appropriate field office shall complete sections A through G of a Smoke Impact Report Form 1-4-1-301 within two working days and forward it to the Smoke Management Forecast unit. Sections H through L of the form shall be completed by the Smoke Management unit and final copies of the report will be distributed to interested agencies.~~

SMOKE IMPACT REPORT
Form 1-4-1-301

A. SMOKE ORIGIN:

Unit Number(s)	District Forest	Legal Descr	Owner Class	Elev	Acres	Tons	Ign Time	Date Burned

B. IMPACT DESCRIPTION:

1. Area Affected _____ SSRA (Yes____)(No____)

2. Date _____ Time _____ smoke entered area. Duration _____hours

3. Type: Main Plume _____ Drift Smoke _____ Residual Smoke _____

4. Describe Smoke Behavior (including distances and elevations of base of plume) _____
_____
_____

5. Cause of intrusion/incident _____
_____
_____

6. Public complaints received:_____

C. SMOKE MANAGEMENT FORECAST AND INSTRUCTIONS:

1. Forecast transport wind direction and speed at ignition time and for next 12 hours _____
_____

2. Observed transport wind direction and speed at ignition time and for next 12 hours _____
_____

3. Forecast surface wind direction and speed at ignition time and for next 12 hours (24 hours if residual smoke was a factor) _____

4. Observed surface wind direction and speed at ignition time and for next 12 (24) hours _____
_____

5. Describe significant changes in transport or surface wind conditions: _____
_____
_____Were these changes forecast _____

6. Describe general weather conditions observed during the burn period and for the next 6 hours (sky conditions, type and height of clouds, precipitation etc).____
_____

7. If observed weather was different than the forecast, was Salem consulted? _____
_____

8. What were Smoke Management Instructions? Include written and/or verbal _____
_____

D. FUEL MOISTURES AT IGNITION TIME:

1 hour_____ 10 hour_____ 100 hour_____ 1000 hour_____

E. OTHER VISIBILITY RESTRICTING SOURCES PRESENT:
Field Smoke_____ Resident Emissions_____ Ag Smoke_____ Dust_____
Other prescribed Fire Smoke (source) _____ Other (Specify)_____
Wildfire Smoke (Fire's Name)_____Unable to identify_____

F. COMMENTS: _____
_____
_____

SECTION H THROUGH M TO BE COMPLETED BY SALEM FORECASTER:

H. IMPACT INTENSITY:

1. Average SSRA prevailing visibility for 3 hours prior to start of impact _____ miles.

2. Lowest prevailing visibility during duration of impact _____ miles.

3. Average SSRA nephelometer for 3 hours prior to start of impact _____

4. Highest nephelometer during duration of impact _____

5. Classification based on visibility or nephelometer:

Light ___ Moderate ___ Heavy ___ Measured_____ or Estimated _____
Unknown or can't determine ____ No classification due to other sources ____

If moderate or heavy, the number of hours in those categories: Moderate_____ Heavy _____

I. OBSERVED MIXING DEPTH, TRANSPORT WIND AND WINDSHEAR AT NEAREST UPPER AIR SITE.
_____
_____

J. GENERAL SYNOPTIC CONDITIONS, BOTH LARGE AND SMALL SCALE. Be as specific as possible with feature location. Include surface and upper air map type. _____
_____
_____
_____

K. ***WERE FORECASTS ADEQUATE*** (Y/N) _____ Why_____
_____

L. ***WERE INSTRUCTIONS ADEQUATE*** (Y/N) _____ Why _____
_____

M. ***COMMENTS***
_____
_____
_____
_____

_____ _____
District/Forest Representative Smoke Management Forecaster

_____
Intrusion/Incident No.

SMOKE ~~IMPACT~~ INTRUSION REPORT
Form 1-4-1-301

Intrusion #: _____ **Intrusion Date(s):** _____ **Location(s):** _____

SECTIONS A-E TO BE COMPLETED BY SALEM FORECASTER:

A. SMOKE ORIGIN:

12-digit Unit Number(s)	Fire Zone	District Forest	Location (TRS)	Owner Class	Elev	Acres	Tons	Burn Date	Start Time	End Time

B. INTRUSION SUMMARY:

1. Area Affected _____ SSRA (Yes ☐ No ☐)
2. Intrusion Date _____ Start Time _____ End Time _____ Duration _____ hours
3. Highest Pm2.5 _____ or lowest prevailing visibility (during intrusion) _____

C. ODF SMOKE FORECAST:

	Mixing Height	Surface Wind	Transport Wind
At Start of Ignition			
At End of Ignition			
Next 12 hours			

D. ODF SMOKE INSTRUCTIONS:

1. Written instructions (if applicable): _____
2. Verbal instructions (if applicable): _____

E. SMOKE MANAGEMENT WEATHER OFFICE REPORT:

1. Describe general weather conditions (including observed mixing heights and transport winds): _____
2. Comments: _____

SECTION F TO BE COMPLETED BY FIELD PERSONNEL:

F. FIELD REPORT:

1. Describe general weather conditions observed during the burn period and for the next 6 hours (sky conditions, wind speed and direction, height of smoke plume, direction of smoke travel, etc. _____
2. Comments *(Note other sources of smoke that may have contributed to the intrusion)*: _____
3. Public complaints: _____

_____/_____		_____/_____
District/Forest Representative/Date		Smoke Management Forecaster/Date

[YNJ11]

SMOKE INCIDENT LOG

Smoke Incident Log								
Date	Time begin (24 hr local)	Duration (hrs)	Magnitude (mg/c3)	Area Affected	Responsible Agency	Comments		

[YNJ12]

SMOKE ~~INTENSITY~~ MAGNITUDE DETERMINATION FROM VISIBILITY OBSERVATIONS

INTRODUCTION: When no ~~nephelometer~~ PM monitor data is available to determine the ~~intensity~~ magnitude of a smoke ~~incident~~impact, visibility data may be used to estimate the level of impact when such data is available from a reliable source. The observation procedure outlined below, using standard National Weather Service visibility criteria from Federal Meteorological Handbook No. 1, may be utilized by field units to gauge impacts in areas where no monitoring data is available. Prevailing visibility is used as a surrogate for ~~nephelometer~~ PM monitor data. Use the procedure outlined below to determine prevailing visibility and the visibility table ~~at~~ in Appendix 2, page ~~7~~ 6 ~~of the Smoke Management Directive 1-4-1-601~~ to make an estimate of the ~~intensity~~ magnitude of a smoke impact.

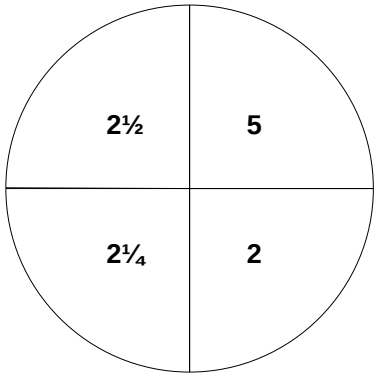
OBSERVATION PROCEDURE:

1. Determination of sector visibility: When the visibility is not uniform in all directions, divide the horizon circle into sectors which have approximately the same visibility. Using available landmarks, aided by a detailed local area map, determine the greatest distances that can be seen in each segment of the horizon circle. Base this estimate on the appearance of the landmark. If the markers are visible with sharp outlines and little blurring of color, the visibility is much greater than the distance to the markers. If a marker can barely be seen and identified, the visibility is about the same as the distance to that marker. When the visibility is greater than the distance of the farthest markers, estimate the greatest distance you can see in that direction. Note the portions of the circle with similar visibility characteristics.

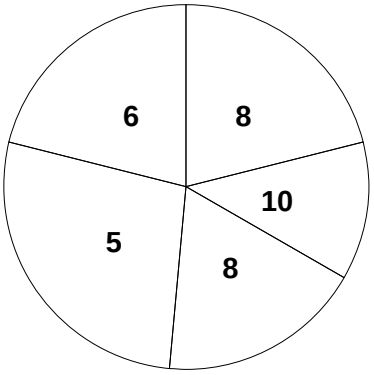
2. Determination of prevailing visibility: After sector visibilities have been determined, resolve them into a single value for reporting purposes. To do this, use either the greatest distance that can be seen throughout at least half the horizon circle, or if the visibility is varying rapidly during the time of the observation, use the average of all observed values. Prevailing visibility should be reported in miles.

EXAMPLES – Determining Prevailing Visibility
(Prevailing Visibility indicated by asterisks)

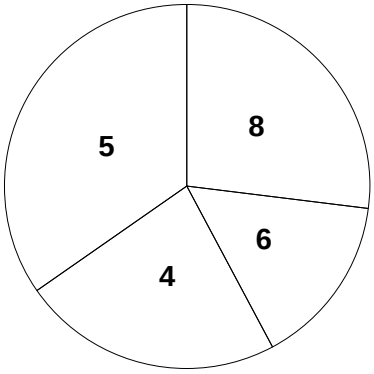
Visibility (Miles)	Approximate Degrees
5	90
2½ *	90
2¼	90
2	90



Visibility (Miles)	Approximate Degrees
10	40
8*	150
6	70
5	100



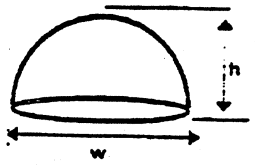
Visibility (Miles)	Approximate Degrees
8	100
6	50
5*	130
4	80



OREGON SMOKE MANAGEMENT SMOKE COMPLAINT REPORT		
Complaint From:	Name:	Organization:
	Address:	Phone:
Received by:	Name:	Office:
	Date:	Time:
Complaint Source:	☐ Phone:	☐ Mail
	☐ In Person	☐ Email:
	☐ Other:	
Investigated By:	Name:	Office:
	Date:	Time:
Location of Smoke Impact:		
Location of Smoke Source:	T R sec	Unit Number(s):
Description of Complaint:		
☐	Inform the complainant that they have ability to receive follow-up.	
Investigation Results:	☐ Burn Permit Issued	Landowner
	Reported Tons/Acres	Actual Tons/Acres
	☐ In data system	Citation issued
	☐ Instruction Compliance	☐ Referred to other Agency
	☐ Other	
Remarks:		
Distribution:	☐ Smoke Management	USFS: R6 ☐ District ☐
	☐ District	BLM: State Office ☐ District ☐
	☐ Area	Tribe/Other Agency ☐
Complaint No.	Signature	Date

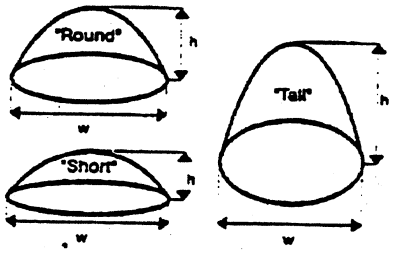
SHAPE CODE CHARTS

1. Half-section of Sphere



Half of a ball, where the width is approximately twice the height, and the sides are evenly rounded.

2. Parabaloids

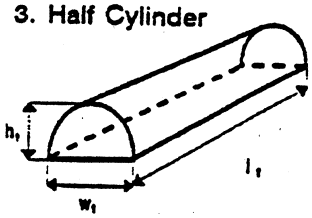


Pile height is same as radius (half diameter), but surface tapers in a parabola towards the top.

Sides taper in a parabola towards the top, where the height is greater than the radius (half the width).

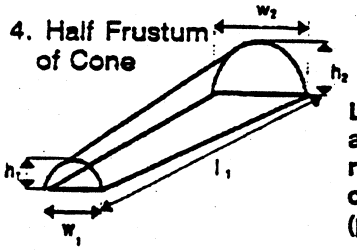
Pile height is less than half the radius, and the sides drop down to the base in a parabola.

3. Half Cylinder



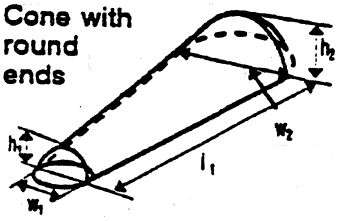
Logs and debris are generally aligned in parallel. Pile shape is rounded side-to-side, with both ends of the pile approximately the same height.

4. Half Frustum of Cone



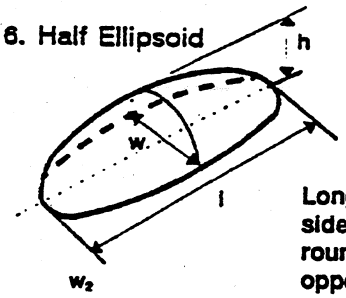
Logs and debris are generally aligned in parallel. Pile shape is rounded side-to-side, but heights of opposing ends are not equal (pile tapers).

5. Half Frustum of Cone with round ends



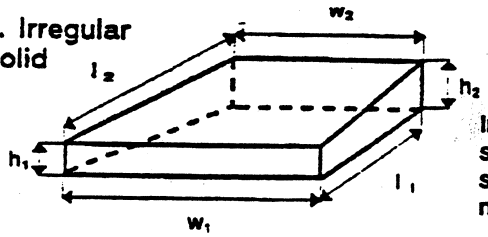
Pile shape is generally the same as #4, but the ends are rounded, and appearance is similar to half a pear.

6. Half Ellipsoid



Long, tapering pile, rounded side-to-side, with well-rounded ends. Widths of opposing ends are not equal.

7. Irregular Solid



Irregularly-shaped pile with straight but uneven sides. Dimensions for opposing sides are not necessarily equal.

AERIAL MONITORING

The form below (available on the department Smoke Management ~~web pages~~website) may be used to record observations during aerial monitoring flights. ~~Information should be transmitted to the Smoke Management forecaster frequently during the flight.~~ Completed forms should be forwarded to the forecaster after the flight has been completed.

Aerial monitoring should be conducted during periods of considerable burning and when burning in less than excellent atmospheric dispersion conditions. Monitoring should be scheduled far enough into the burns to determine the extent and direction of smoke drift.

Instructions for entries are found on the second page of the form. Flying parallel to the smoke plume is recommended to ensure accurate determination of the direction of movement of the smoke. The plume type diagrams provide a quick reference for generalized descriptions. If they do not adequately describe the character of the observed smoke, specific descriptions of observed plumes should be made.

The chart on the second page of the form may be used during takeoff and/or landing to record a temperature profile using the aircraft outside air temperature sensor. These profiles are an aid to help determine atmospheric stability and mixing height.

Aerial Smoke Monitoring Form

Date: Observer Takeoff Time Landing Time

Flight Route:

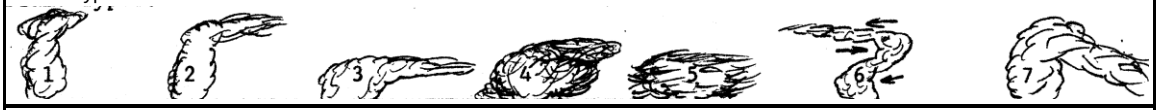
Weather Elements: (Cloud type and amount, Visibility, Haze Layers, etc.)

Air Quality/Other Burning:

Prescribed Burning Smoke Behavior

Time	Location	Unit Number	Smoke Layers Base	Smoke Layers Top	Smoke Movement Low-level	Smoke Movement Aloft	Remarks: (Plume type, surface smoke, dispersion, wind/shear, etc.)

Plume Types:



SSRA/Class I Area impact: Occuring_____ Likely _____

Which Area:

Smoke Source:

Level of Impact:

Guide for Completing Aerial Monitoring Form

Flight Route: General description of area observed.

Weather Elements: Weather factors affecting smoke behavior. Cloud height and amount of sky coverage. Layers and vertical development. Visibility. Haze layer(s) height, thickness, density. Aircraft measured wind direction and speed.

Air Quality/Other Burning: Haze or smoke layers as a result of industrial, agricultural, or other burning. Estimate height, thickness, density. If possible determine if surface based or aloft. Identify sources if observable.

Time: Time of each observation made.

Location: Township, range, section or lattitude and longitude. Location relative to SSRAs if close.

Unit #: Identify number if was planned.

Smoke Layers: If smoke is layering determine top and bottom and estimate visibility or visibility change from clear air.

Smoke Movement: Determine or estimate movement of various levels or heights in a column. Look for shear layers.

Remarks: Other factors that would aid in data analysis. Length of layered smoke plume, smoke mixing down toward surface. Downwind dissipation.

Plume Type descriptions:

1. Good vertical lift. Plume holds together. Little or no low-level smoke escape. Light wind, little shear.

2. Good vertical lift. Plume generally holds together. Column tilted by wind or top shearing off at relatively high elevation.

3. Limited plume rise. Plume generally well defined with definite low-level downwind spread of layered smoke.

4. Poor lift. Smoke rises little. Tends to hold to a defined area but some escape or low-level smoke.

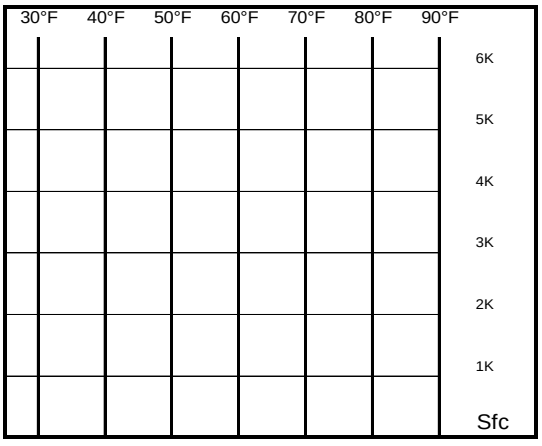
5. No column development. Smoke diffuses with little or no lift. Most smoke near surface with little tendency to hold together. Smoke spreads.

6. Plume mostly intact. Indications of one or more shear layers apparent. Identify directions if possible.

7. Plume initially rises but bends over or mixes significantly back to the surface.

SSRA/Class I Area Impact: Identify area impacted or likely to be impacted, intensity of impact. Main plume, drift, residual.

TEMPERATURE PROFILE
Indicate temperatures during climb-out or descent. Note inversion layers (temperature increasing with height). Plot profile at right.



SPECIAL PROTECTION ZONE ~~REQUIREMENTS~~MAPS

Special Protection Zone (SPZ) boundaries are shown in ~~the~~ maps in this appendix. SPZ rules are found in OAR 629-048-0135 and 0137.

~~These SPZ provisions apply from November 15 through February 15 to the following communities which are particulate matter (PM) nonattainment and maintenance areas: Klamath Falls, Medford, Oakridge, and Lakeview. The contingency plan requirements of this appendix shall apply to these areas, and to the Eugene/Springfield, Grants Pass, and La Grande maintenance areas, during the dates specified in the contingency plan.~~

~~From November 15 through February 15, prescribed burning in the SPZ is allowed on "Green" and "Yellow" woodstove days if:~~

~~The ODF management meteorologist believes there will be no measurable smoke impacts.~~

~~2. Landowners are responsible for intermittent monitoring for at least three days following ignition to ensure the smoke is not causing an impact. ODF can waive this provision if it believes monitoring is unnecessary on a specific burn unit.~~

~~3.Landowners provide a level of mop-up, as directed by ODF, to prevent or minimize smoke impacts. Mop-up shall be included as an element of the burn plan.~~

~~4. ODF believes that piles will not produce significant smoke after the third day.~~

~~From December 1 through February 15, no prescribed burning is allowed on "Red" woodstove days in the SPZ. Prescribed burning on "Red" days from November 15 through 30 is allowed and subject to the same conditions for "Green" and "Yellow" days.~~

~~For the Medford SPZ, burning should be prioritized so units that are smaller and/or further from the SPZ boundary have higher priority to burn than units larger and/or closer to the SPZ boundary.~~

~~Districts and Forests having jurisdiction in any SPZ will be responsible for monitoring restrictions in the nonattainment or maintenance area.~~

~~The SPZ provisions shall apply as long as the area is in PM nonattainment or if it is determined by the Oregon Department of Environmental Quality (DEQ), or the Lane Regional Air Protection Agency (LRAPA), that a specific SPZ is no longer needed for maintenance of the PM standard. An SPZ shall be developed by DEQ or LRAPA for any newly declared PM nonattainment area, in consultation with ODF. For areas declared nonattainment from January 1 through May 31, the new SPZ requirements shall become effective on November 15 in the year the area is declared nonattainment. If the area is declared nonattainment from June 1 through December 31, the new SPZ shall be~~

~~effective on November 15 of the following year.~~

~~Contingency Plan Requirements:~~

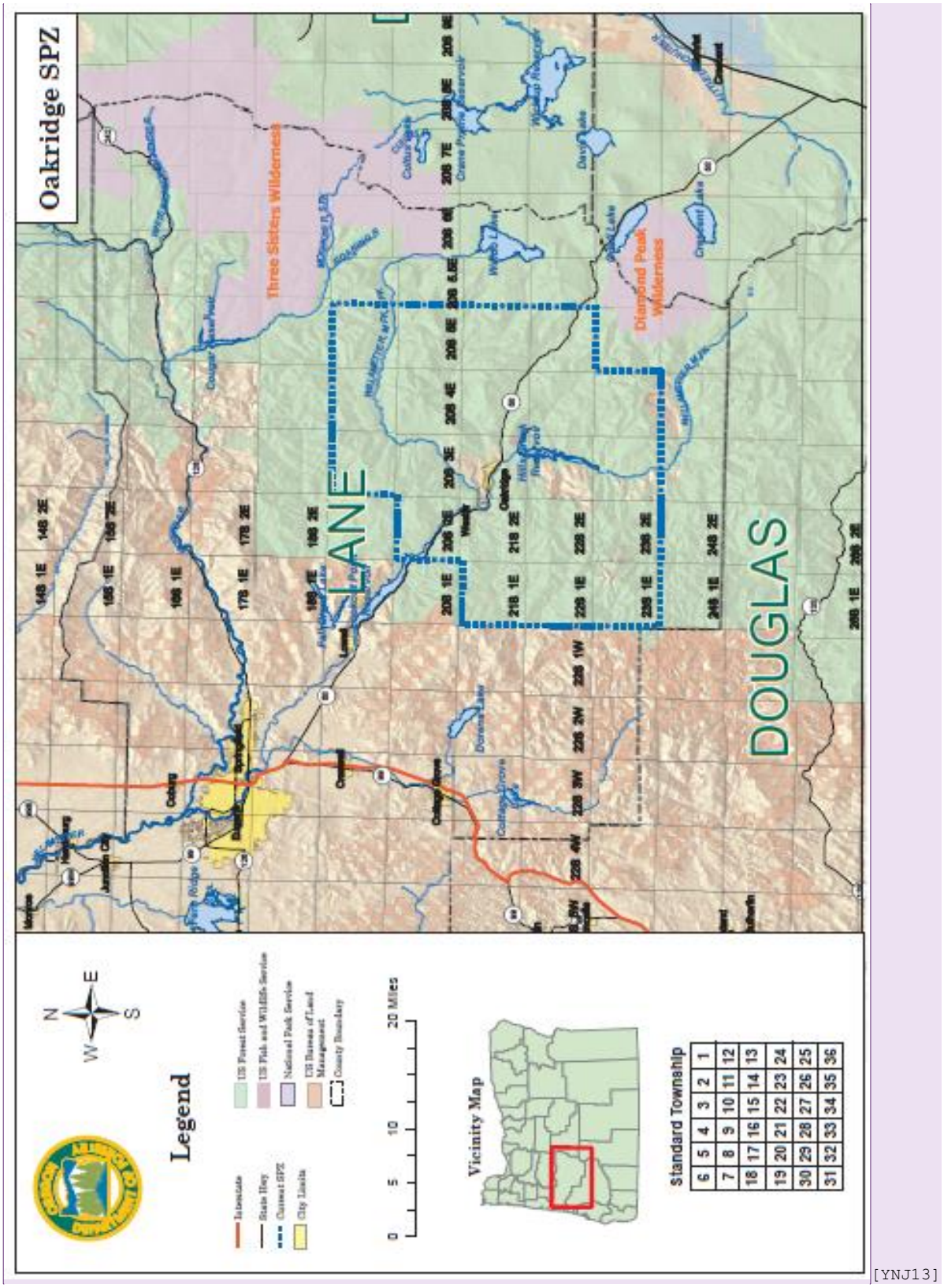
~~In the event any of the communities listed above violate the PM standard and prescribed burning is determined to be a significant contributor to the violation, the following provisions shall be implemented:~~

~~1.The SPZ boundary will be expanded to include the area from which prescribed burning could impact the PM nonattainment or maintenance area. Any boundary change will be jointly agreed to by ODF and DEQ.~~

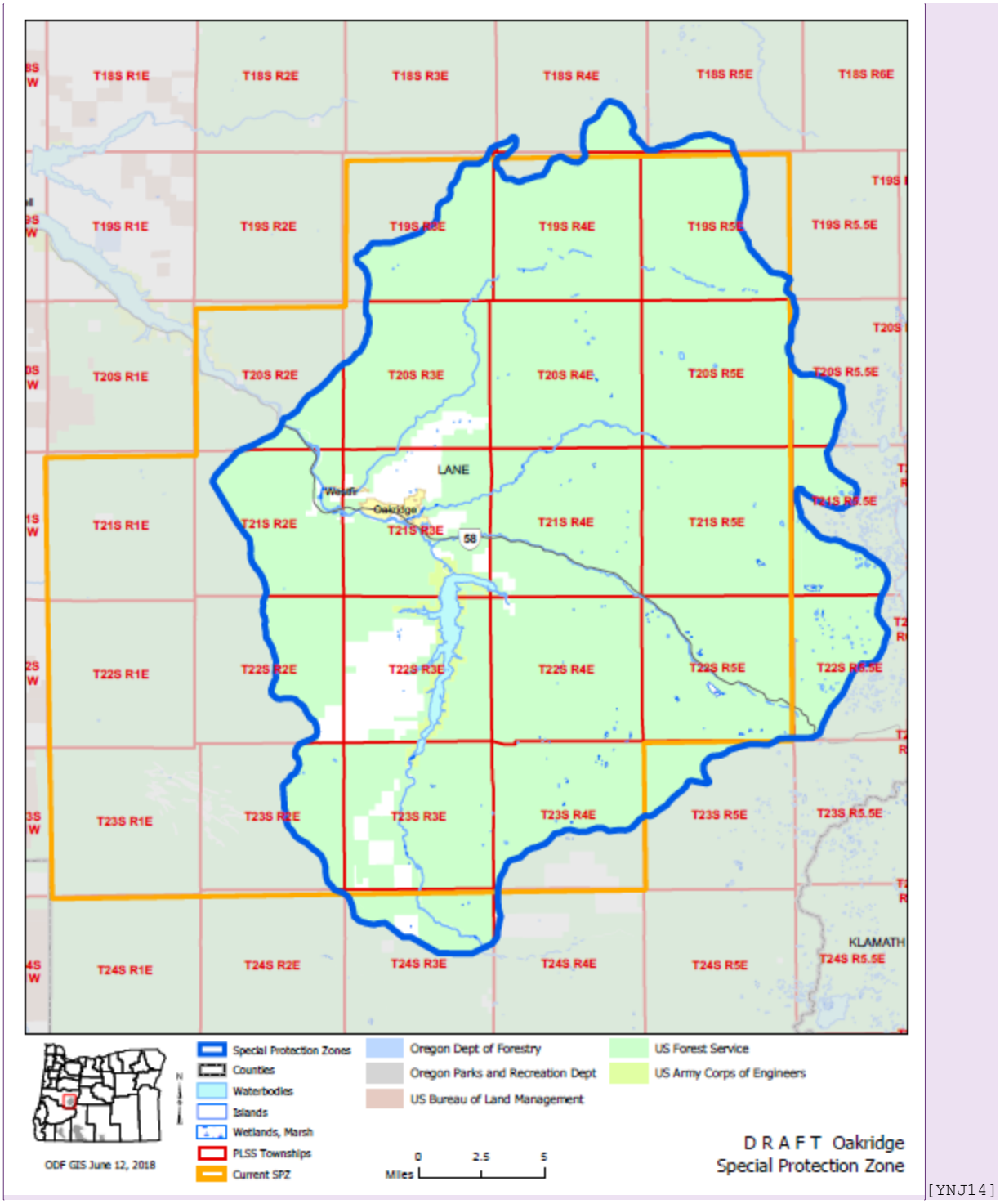
~~2.SPZ restrictions will apply from November 1 through March 1, except for Klamath Falls where they will apply from November 1 through April 1.~~

~~3.The SPZ for Klamath Falls and Lakeview, as well as all future PM nonattainment areas in areas of level 2 regulation under the Oregon Smoke Management program, shall be subject to burning requirements of Level 1 regulation during the time when the SPZ is in effect.~~

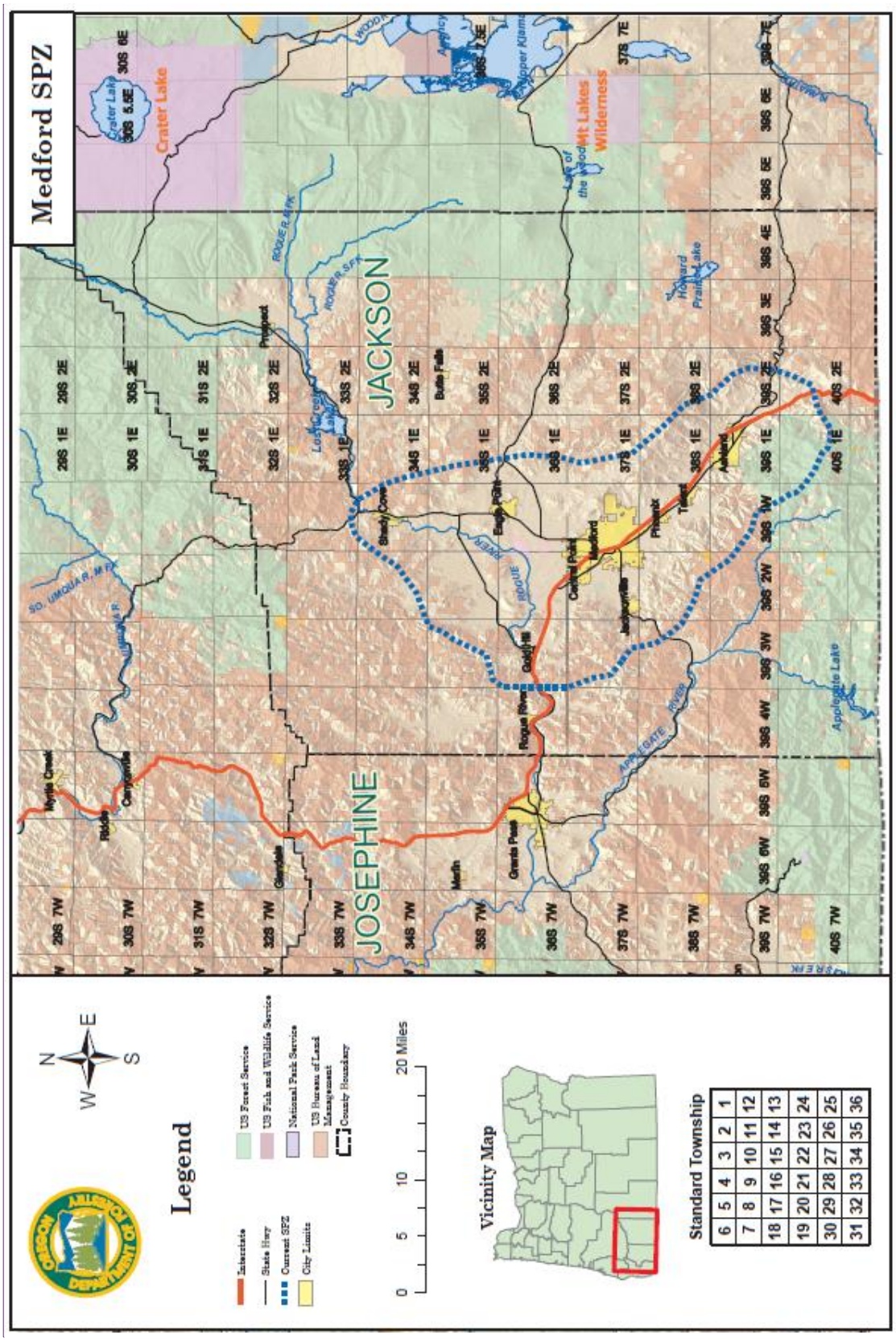
~~4.Prescribed burning will be prohibited within the SPZ during December and January if an impact attributable to prescribed forestland burning of 5 to 10 micrograms per cubic meter (24-hour average) is demonstrated by air quality monitoring after the contingency provisions are in effect. Burning will be prohibited from November 1 through March 1 if a prescribed burning impact of 10 micrograms per cubic meter (24-hour average) is demonstrated by monitoring after the contingency provisions go into effect. ODF and DEQ must jointly agree on the magnitude and duration of the impact before these provisions are enacted. The provisions apply only to burning within the SPZ during the SPZ protection period.~~

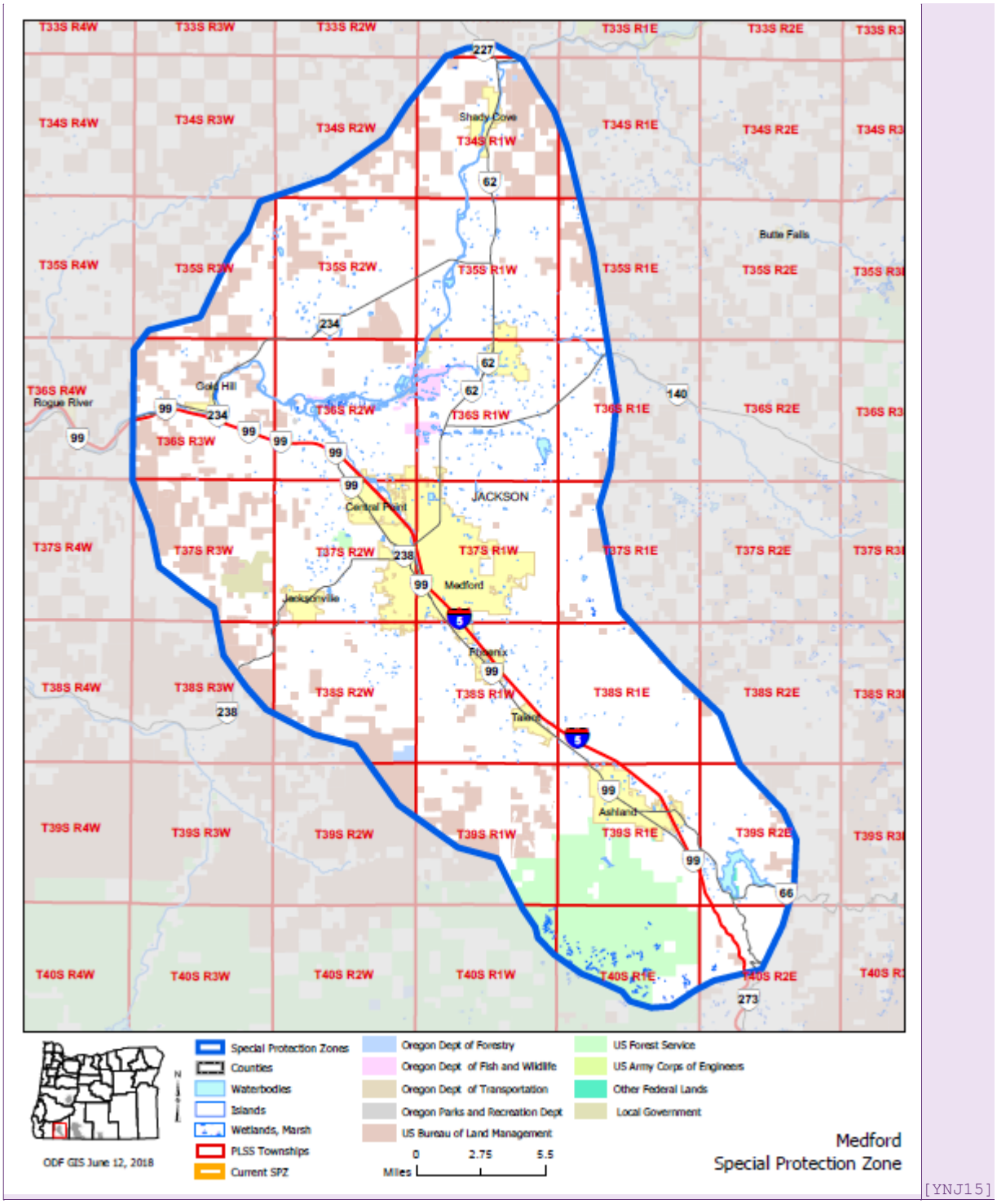

Oakridge SPZ
Three Sisters Wilderness
Diamond Peak Wilderness
LANE
DOUGLAS
Legend
Interstate
State Hwy
Outreat SPZ
City Limits
US Forest Service
US Fish and Wildlife Service
National Park Service
US Bureau of Land Management
County Boundary
0
5
10
20 Miles
N
E
S
W
Vicinity Map
Standard Township
6 5 4 3 2 1
7 8 9 10 11 12
18 17 16 15 14 13
19 20 21 22 23 24
30 29 28 27 26 25
31 32 33 34 35 36

[YNJ13]

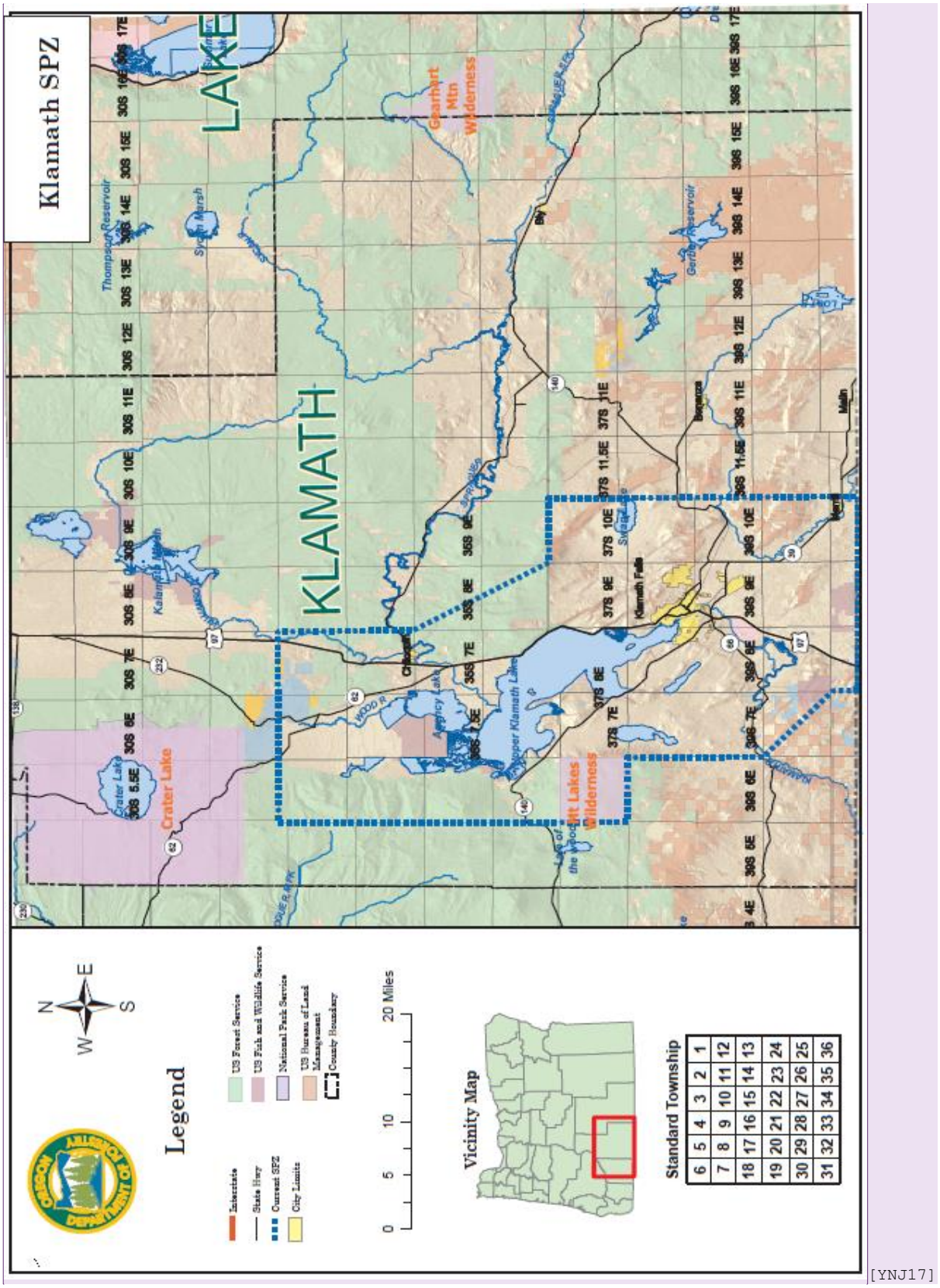

T18S R1E
T18S R2E
T18S R3E
T18S R4E
T18S R5E
T18S R6E
T19S R1E
T19S R2E
T19S R3E
T19S R4E
T19S R5E
T19S R5.5E
T20S R1E
T20S R2E
T20S R3E
T20S R4E
T20S R5E
T20S R5.5E
T21S R1E
T21S R2E
T21S R3E
T21S R4E
T21S R5E
T21S R5.5E
T22S R1E
T22S R2E
T22S R3E
T22S R4E
T22S R5E
T22S R5.5E
T23S R1E
T23S R2E
T23S R3E
T23S R4E
T23S R5E
T23S R5.5E
T24S R1E
T24S R2E
T24S R3E
T24S R4E
T24S R5E
T24S R5.5E
LANE
KLAMATH
Westfir
Oakridge
58
Special Protection Zones
Counties
Waterbodies
Islands
Wetlands, Marsh
PLSS Townships
Current SPZ
Oregon Dept of Forestry
Oregon Parks and Recreation Dept
US Bureau of Land Management
US Forest Service
US Army Corps of Engineers
0
2.5
5
Miles
ODF GIS June 12, 2018
D R A F T Oakridge
Special Protection Zone

[YNJ14]

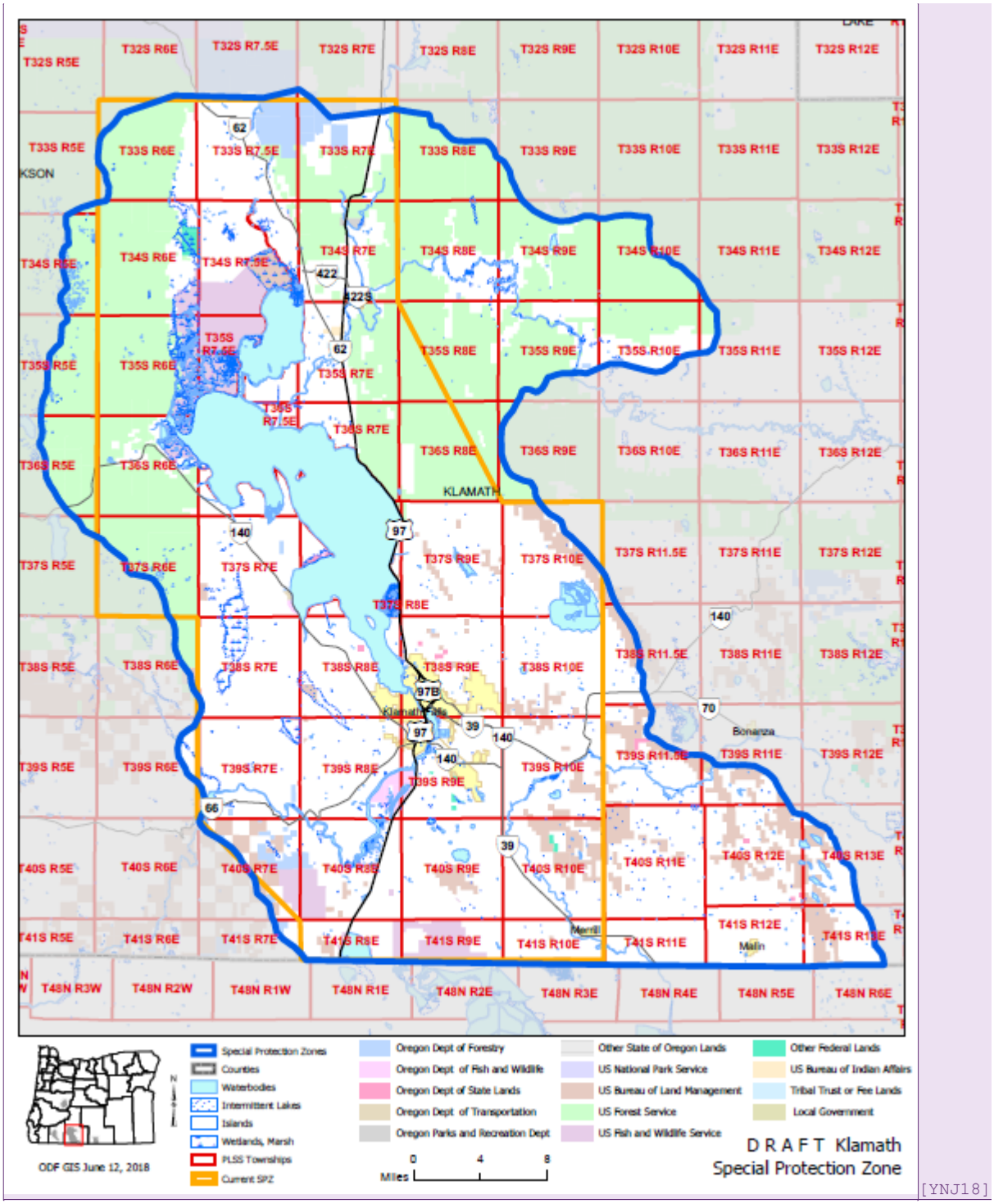

Medford SPZ
JACKSON
JOSEPHINE
Crater Lake
Mt Lakes Wilderness
Legend
Interstate
State Hwy
Current SPZ
City Limits
US Forest Service
US Fish and Wildlife Service
National Park Service
US Bureau of Land Management
County Boundary
0 5 10 20 Miles
Vicinity Map
Standard Township
6 5 4 3 2 1
7 8 9 10 11 12
18 17 16 15 14 13
19 20 21 22 23 24
30 29 28 27 26 25
31 32 33 34 35 36


T33S R4W
T33S R3W
T33S R2W
T33S R1E
T33S R2E
T34S R4W
T34S R3W
T34S R2W
T34S R1W
T34S R1E
T34S R2E
T35S R4W
T35S R3W
T35S R2W
T35S R1W
T35S R1E
T35S R2E
T36S R4W
T36S R3W
T36S R2W
T36S R1W
T36S R1E
T36S R2E
T37S R4W
T37S R3W
T37S R2W
T37S R1W
T37S R1E
T37S R2E
T38S R4W
T38S R3W
T38S R2W
T38S R1W
T38S R1E
T38S R2E
T39S R4W
T39S R3W
T39S R2W
T39S R1W
T39S R1E
T39S R2E
T40S R4W
T40S R3W
T40S R2W
T40S R1W
T40S R1E
T40S R2E
Shady Cove
Butte Falls
Gold Hill
Rogue River
Central Point
JACKSON
Medford
Jacksonville
Phoenix
Talent
Ashland
227
62
234
99
238
140
66
273
Special Protection Zones
Counties
Waterbodies
Islands
Wetlands, Marsh
PLSS Townships
Current SPZ
Oregon Dept of Forestry
Oregon Dept of Fish and Wildlife
Oregon Dept of Transportation
Oregon Parks and Recreation Dept
US Bureau of Land Management
US Forest Service
US Army Corps of Engineers
Other Federal Lands
Local Government
0 2.75 5.5
Miles
ODF GIS June 12, 2018
Medford
Special Protection Zone
[YNJ15]

[YNJ16]Protection
~~0703~~/~~1419~~

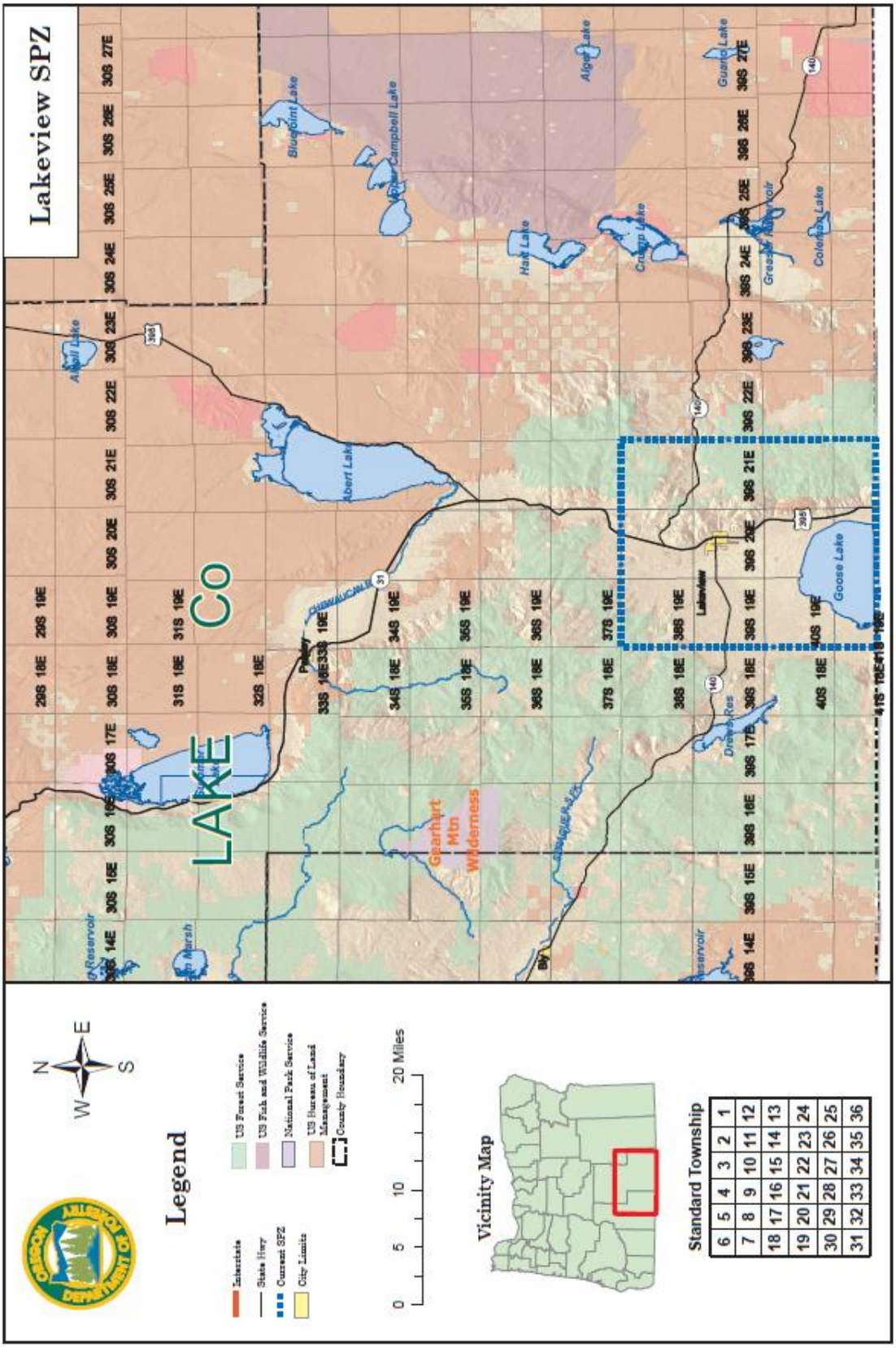


[YNJ17]

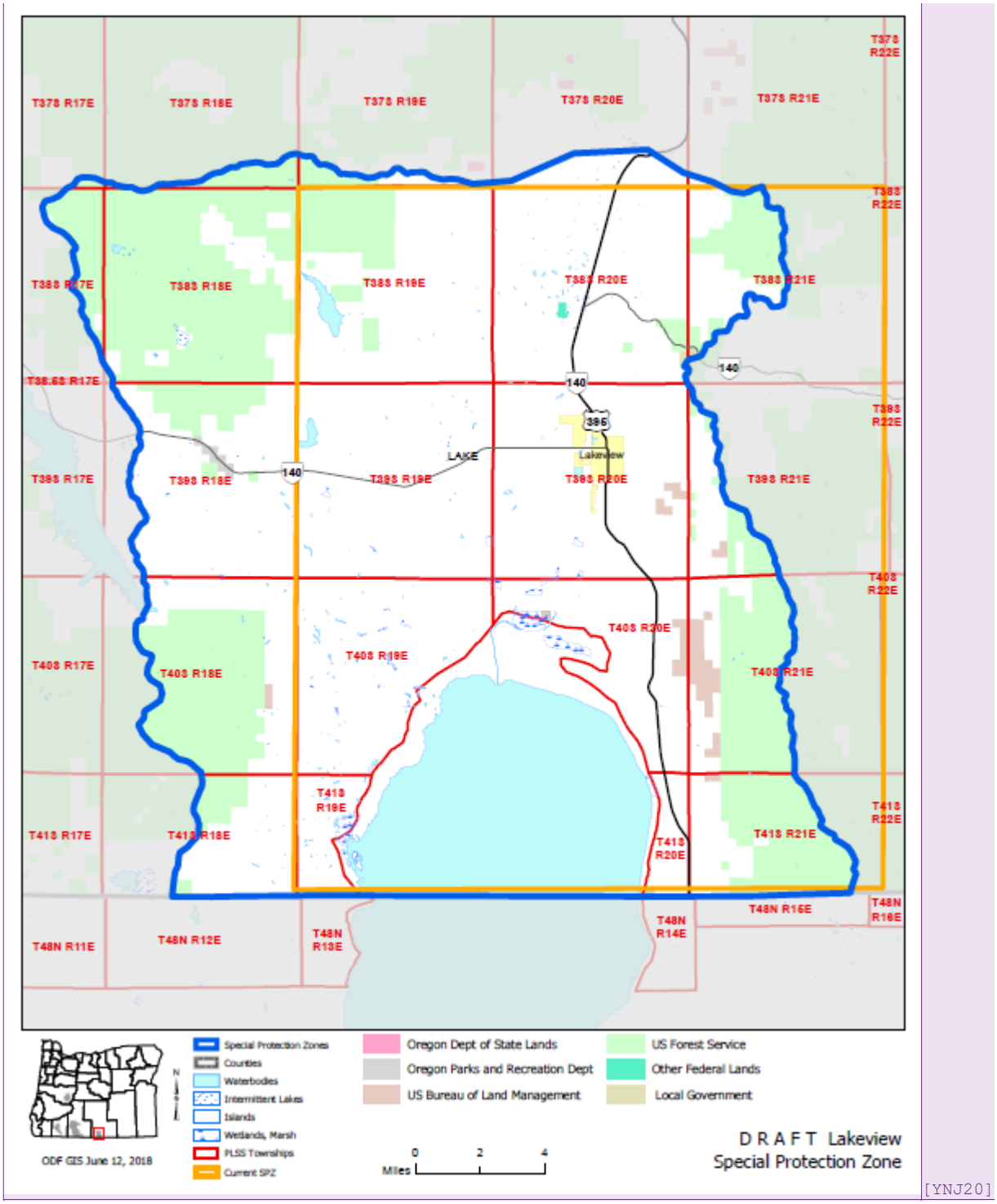

T32S R5E
T32S R6E
T32S R7.5E
T32S R7E
T32S R8E
T32S R9E
T32S R10E
T32S R11E
T32S R12E
T33S R5E
T33S R6E
T33S R7.5E
T33S R7E
T33S R8E
T33S R9E
T33S R10E
T33S R11E
T33S R12E
T34S R5E
T34S R6E
T34S R7.5E
T34S R7E
T34S R8E
T34S R9E
T34S R10E
T34S R11E
T34S R12E
T35S R5E
T35S R6E
T35S R7.5E
T35S R7E
T35S R8E
T35S R9E
T35S R10E
T35S R11E
T35S R12E
T36S R5E
T36S R6E
T36S R7.5E
T36S R7E
T36S R8E
T36S R9E
T36S R10E
T36S R11E
T36S R12E
T37S R5E
T37S R6E
T37S R7E
T37S R8E
T37S R9E
T37S R10E
T37S R11.5E
T37S R11E
T37S R12E
T38S R5E
T38S R6E
T38S R7E
T38S R8E
T38S R9E
T38S R10E
T38S R11.5E
T38S R11E
T38S R12E
T39S R5E
T39S R6E
T39S R7E
T39S R8E
T39S R9E
T39S R10E
T39S R11.5E
T39S R11E
T39S R12E
T40S R5E
T40S R6E
T40S R7E
T40S R8E
T40S R9E
T40S R10E
T40S R11E
T40S R12E
T40S R13E
T41S R5E
T41S R6E
T41S R7E
T41S R8E
T41S R9E
T41S R10E
T41S R11E
T41S R12E
T41S R13E
T48N R3W
T48N R2W
T48N R1W
T48N R1E
T48N R2E
T48N R3E
T48N R4E
T48N R5E
T48N R6E
KLAMATH
Bonanza
Merrill
Malin
62
422
422S
140
97
97B
39
70
66
Special Protection Zones
Counties
Waterbodies
Intermittent Lakes
Islands
Wetlands, Marsh
PLSS Townships
Current SPZ
Oregon Dept of Forestry
Oregon Dept of Fish and Wildlife
Oregon Dept of State Lands
Oregon Dept of Transportation
Oregon Parks and Recreation Dept
Other State of Oregon Lands
US National Park Service
US Bureau of Land Management
US Forest Service
US Fish and Wildlife Service
Other Federal Lands
US Bureau of Indian Affairs
Tribal Trust or Fee Lands
Local Government
0
4
8
Miles
ODF GIS June 12, 2018
D R A F T Klamath
Special Protection Zone
[YNJ18]

Protection
~~0703~~/~~14~~ 19

DIRECTIVE
1-4-1-601, p. 49
Appendix 5, p. 6



[YNJ19]


T37S R17E
T37S R18E
T37S R19E
T37S R20E
T37S R21E
T37S R22E
T38S R17E
T38S R18E
T38S R19E
T38S R20E
T38S R21E
T38S R22E
T38.5S R17E
T39S R17E
T39S R18E
T39S R19E
T39S R20E
T39S R21E
T39S R22E
T40S R17E
T40S R18E
T40S R19E
T40S R20E
T40S R21E
T40S R22E
T41S R17E
T41S R18E
T41S R19E
T41S R20E
T41S R21E
T41S R22E
T48N R11E
T48N R12E
T48N R13E
T48N R14E
T48N R15E
T48N R16E
140
386
LAKE
Lakeview
Special Protection Zones
Counties
Waterbodies
Intermittent Lakes
Islands
Wetlands, Marsh
PLSS Townships
Current SPZ
Oregon Dept of State Lands
Oregon Parks and Recreation Dept
US Bureau of Land Management
US Forest Service
Other Federal Lands
Local Government
0
2
4
Miles
ODF GIS June 12, 2018
D R A F T Lakeview
Special Protection Zone
[YNJ20]

Atmospheric Environment 150 (2017) 395–406

Contents lists available at ScienceDirect

Atmospheric Environment

journal homepage: www.elsevier.com/locate/atmosenv

Emissions from prescribed burning of timber slash piles in Oregon

Johanna Aurell [a], Brian K. Gullett [b, *], Dennis Tabor [b], Nick Yonker [c]

[a] University of Dayton Research Institute, 300 College Park, Dayton, OH, 45469, USA
[b] U.S. Environmental Protection Agency, Office of Research and Development, National Risk Management Research Laboratory, Research Triangle Park, NC, 27711, USA
[c] Oregon Department of Forestry Fire Protection, 2600 State St., Salem, OR, 97310, USA

HIGHLIGHTS

- Dry biomass piles burned with higher combustion efficiency than wet piles.
- Piles that had been covered with polyethylene had lower emissions than wet piles.
- Burning the polyethylene cover on the pile had no distinctive effect on emissions.

GRAPHICAL ABSTRACT

ARTICLE INFO

Article history:
Received 16 August 2016
Received in revised form
10 November 2016
Accepted 11 November 2016
Available online 12 November 2016

Keywords:
Emission factors
Timber slash
Pile cover
Moisture
Polyethylene
Biomass burning

ABSTRACT

Emissions from burning piles of post-harvest timber slash (Douglas-fir) in Grande Ronde, Oregon were sampled using an instrument platform lofted into the plume using a tether-controlled aerostat or balloon. Emissions of carbon monoxide, carbon dioxide, methane, particulate matter ($PM_{2.5}$), black carbon, ultraviolet absorbing PM, elemental/organic carbon, filter-based metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated dibenzodioxins/dibenzofurans (PCDD/PCDF), and volatile organic compounds (VOCs) were sampled to determine emission factors, the amount of pollutant formed per amount of biomass burned. The effect on emissions from covering the piles with polyethylene (PE) sheets to prevent fuel wetting versus uncovered piles was also determined. Results showed that the uncovered ("wet") piles burned with lower combustion efficiency and higher emission factors for VOCs, $PM_{2.5}$, PCDD/PCDF, and PAHs. Removal of the PE prior to ignition, variation of PE size, and changing PE thickness resulted in no statistical distinction between emissions. Results suggest that dry piles, whether covered with PE or not, exhibited statistically significant lower emissions than wet piles due to better combustion efficiency.

Published by Elsevier Ltd.

1. Introduction

To reduce wildfire risk and to improve timber forest productivity and health, woody biomass fuels from selective thinning and timber harvests are mechanically treated and piled for burning (Cross et al., 2013; Trofymow et al., 2014). This practice is becoming more prevalent, particularly in the Pacific Northwest, as prescribed fire complexity and risk associated with elevated fuel levels

* Corresponding author.
E-mail addresses: aurell.johanna@epa.gov (J. Aurell), gullett.brian@epa.gov (B.K. Gullett), tabor.dennis@epa.gov (D. Tabor), Nick.J.Yonker@oregon.gov (N. Yonker).

http://dx.doi.org/10.1016/j.atmosenv.2016.11.034
1352-2310/Published by Elsevier Ltd.

(proximity to the wildland/urban interface, smoke effects on air quality and respiratory health) limit the use of broadcast prescribed burning (Wright et al., 2010). Pile burning mitigates concerns about fire safety and air quality as it allows managers to burn under optimal weather conditions and with reduced staffing levels (Wright et al., 2010). Biomass pile burns are often the most economical way to dispose or utilize the biomass due to collection, transportation, and end-product processing costs (Springsteen et al., 2011). Depending on the season and rainfall history, burn piles can smolder for days after they are lit resulting in significant quantities of air pollution (Springsteen et al., 2011). To promote pile combustion, the biomass is preferably dry, resulting in faster, hotter, and more efficient burns, presumably with less pollutants. Common practice involves covering these large piles with polyethylene (PE) film until burn conditions are optimal to prevent moisture saturation during the rainy season. This has raised some questions about emissions from the burning plastic film. The Oregon Department of Forestry (ODF) has used small amounts of PE film sheeting (9.3 m^2) per pile through administrative rulemaking (OAR 629-048-0210) (Oregon Department of Forestry (2014)). Often this is not enough to keep piles dry for efficient consumption after significant rainfall. Because of this limitation, ODF is seeking data to determine whether or not larger and thicker coverings of PE have deleterious effects on burn emissions.

Only a few studies (Hardy, 1996) have investigated pile burn emissions in the field and often the number of pollutants characterized was limited (Hardy, 1996; Ward et al., 1989). Laboratory burns of *pinus ponderosa* slash (twigs, needles, and small branches) by Yokelson et al. (1996) characterized emissions from burn piles (1 m × 2 m) using FTIR analysis. Their work determined emission factors for smoldering/flaming phase as partitioned by modified combustion efficiency. Other work (Hosseini et al., 2014) examined emissions from 2 kg mixtures of manzanita wood (*Arctostaphylos* sp.) with 0, 5, and 50 g of shredded low density PE but found no statistical effect of increase PE content on over 190 compounds.

To complement the laboratory scale work previously done on assessing potential contribution of PE to biomass emissions, this work aimed to characterize and compare emissions from burning woody biomass piles, including dried PE-covered piles and wetted piles, in a large-scale field application.

2. Methods

2.1. Biomass piles

Tests were conducted during mid-October in western Oregon, on a timber-harvested Douglas fir (Pseudotsuga menziesii) stand (45° 0′ 44.14″ N, −123° 41′ 6.49″ W) located about 8 km southwest of Grand Ronde, Oregon and 30 km east of the Pacific coast. The site was at 880 m elevation on a ridge top with an about 10 m change in elevation in the test area. After timber harvesting, the piled material was primarily small branches and limbs of size less than 20 cm in diameter.

Biomass piles approximately 2.5 m high and 5 m in diameter and spaced at least 15 m apart were constructed by the landowner (Fig. 1). Three pile types were tested nominally: Dry, Wet, and Dry Polyethylene (PE) covered. Polyethylene sheeting covered eight of the piles throughout the summer to comprise the Dry and PE-covered test piles for the October tests. The PE was removed from four piles prior to testing and were designated Dry piles. The remaining four covered piles were left with the PE in place and were designated Dry PE piles. PE-covered piles had two film thicknesses, 0.10 mm (4 mil) and 0.15 mm (6 mil), and two area sizes, 3.0 m by 3.0 m (10 ft by 10 ft), and 6.1 m by 6.1 m (20 ft by 20 ft) (Table 1). The remaining four piles were uncovered

Fig. 1. Typical burn pile, uncovered.

Table 1
Test order and type.

Test day	Test order, Type, PE size[a] (if applicable)
Day 1	Burn 1: WET 01
	Burn 2: DRY, PE 6.1 × 6.1 m, 0.15 mm
Day 2	Burn 3: WET 02
	Burn 4: DRY, uncovered
	Burn 5: DRY, PE 3 × 3 m, 0.15 mm
Day 3	Burn 6: WET 03
	Burn 7: DRY, uncovered
	Burn 8: DRY, PE 3 × 3 m, 0.10 mm
	Burn 9: DRY, uncovered
Day 4	Burn 10: DRY, PE 6.1 × 6.1 m, 0.15 mm
	Burn 11: DRY, PE 3 × 3 m, 0.15 mm
	Ambient background

[a] PE = Polyethylene, area in m x m, thickness in mm.

throughout the summer and designated as Wet piles. Air emissions were only collected from three of these Wet piles, the fourth pile was used to check plume height for best collection efficiency prior to emission sampling.

Terrain constraints to pile access, a desire to prevent the emissions from upwind smoldering fires from impinging on new burn piles, and effects of week-long meteorological conditions prohibited true random pile testing. The resultant "ordered" testing affects randomness and may have introduced bias into the measurements as a result of dynamic meteorological variables (conditions present at the end of the testing may be different than those at the beginning) confounding the comparisons. Four days of sampling were conducted in later October. Meteorological data for these dates are reported in Supporting Information (SI). The order and notation for the tests are presented in Table 1.

2.2. Sampling method

Fires were initiated by drip torch immediately after which emissions were sampled using an aerostat-lofted sampler system (Fig. 2) detailed more fully elsewhere (Aurell and Gullett, 2013; Aurell et al., 2011). Briefly, the system consists of a 5 m diameter, helium-filled aerostat, connected with two tethers to all-terrain vehicle (ATV)-mounted winches, upon which is mounted a sampler/sensor system termed the "Flyer". The Flyer was

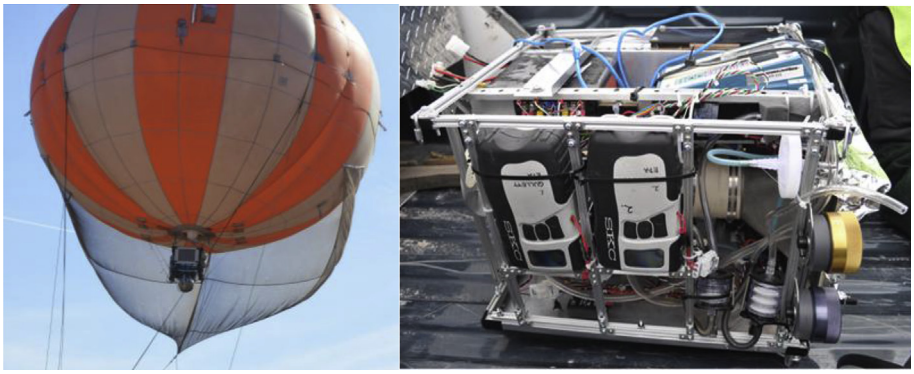


Fig. 2. Aerostat with Flyer (Left) and Flyer close up (Right).

maneuvered into the burn pile plume by controlling tether length and the location of the ATV-mounted tether winches. Sampling periods consisted of both active flaming and smoldering emissions.

2.3. Instrumentation on the Flyer

Emission samples were analyzed for carbon monoxide (CO), methane (CH_4), carbon dioxide (CO_2), particulate matter equal to or less than 2.5 μm ($PM_{2.5}$), black carbon (BC), ultraviolet absorbing (UVPM), elemental/organic/total carbon (EC, OC, TC), polyaromatic hydrocarbons (PAHs), polychlorinated dibenzodioxins/dibenzofurans (PCDDs/PCDFs), filter-based metals, and volatile organic compounds (VOCs). Targeted emission constituents and their sampling methods are listed in Table 2.

The Flyer was equipped with a data acquisition and control program allowing emission samplers to be turned on and off at CO_2 levels above ambient levels (trigger settings: 800 ppm for VOCs and 450 ppm CO_2 for all other emission samplers). The control program data were also transmitted to the ground permitting the operator full control of the emission samplers.

The CO_2 analyzer and the CO sensor were calibrated daily in accordance with EPA Method 3A (1989). A precision gas divider Model 821S (Signal Instrument Co. Ltd., England) was used to dilute the high-level span gases for acquiring the mid-point concentrations for CO_2 analyzer and CO sensor calibration curves. The precision gas divider was evaluated in the field as specified in U.S. EPA Method 205 (2014). The $PM_{2.5}$ and EC/OC/TC sample pumps as well as the AE51/AE52 were calibrated with a Gilibrator Air Flow Calibration System (Sensidyne LP, USA) before and after the field campaign. SUMMA canisters were equipped with a manual valve, metal filter (frit), pressure gauge, pressure transducer, and an electronic solenoid valve which enabled the SUMMA to be opened remotely by the ground-based software to maximize desired sample collection and minimize sampling of ambient air.

PCDD/PCDF samples were cleaned and analyzed using an isotope dilution method based on U.S. EPA Method 23 (1991). Concentrations were determined using high resolution gas chromatography/high resolution mass spectrometry (HRGC/HRMS) with a Hewlett-Packard gas chromatograph 6890 Series coupled to a Micromass Premier mass spectrometer (Waters Corp., Milford, MA, USA) with an RTX-Dioxin 2, 60 m × 0.25 mm × 0.25 μm film thickness column (Restek Corp., Bellefonte, PA, USA). For analysis of tetra- through octa-CDDs/Fs, Method 8290A (U.S. EPA Method 8290A, 2007) was followed. The standard used for PCDD/PCDF identification and quantification is a mixture of standards containing tetra- to octa-PCDD/F native and 13C-labeled congeners designed for modified U.S. EPA Method 23 (1991). Not all of the seventeen PCDD/PCDF toxic equivalent factor (TEF) weighted congeners were detected in all samples. The congeners that were not detected (ND) were set to zero in the text, however SI Tables S6–S9 show values both ND = 0 and ND = limit of detection (LOD). The PCDD/PCDF toxic equivalent (TEQ) emission factors were

Table 2
Target pollutants and sampling methods.

Analyte	Method/Instrument	Frequency	Method reference
CO_2	NDIR LICOR-820[a]	Continuous 1 Hz	(U.S. EPA Method 10A)
CO	Electrochemical cell e2V EC4-500-CO[b]	Continuous 1 Hz	(U.S. EPA Method 10A)
$PM_{2.5}$	SKC Impactor, 47 mm filter 2 μm pore size/ gravimetric	Batch – 10 L/min[c] constant flow	40 CFR Part 50 (1987)
$PM_{2.5}$	DustTrak 8520[d]	Continuous 1 Hz	Laser optical, factory calibration
PCDD/PCDF/PAHs	Quartz filter/PUF/XAD/PUF[e]	Batch – 650 L/min nominal flow[f]	U.S. EPA Compendium Method TO-9A (1999)
VOCs	6 L SUMMA canister	30-60 min integrated sample	U.S. EPA Compendium Method TO-15 (1999)
CO, CO_2, CH_4	6 L SUMMA canister	30-60 min integrated sample	(U.S. EPA Method 25C)
Black carbon	Aethalometer, AE51[g]/AE52[g]	Continuous 1 Hz/0.1 Hz	880 nm by light absorption, factory calibration
UVPM	Aethalometer, AE52[g]	Continuous 0.1 Hz	370 nm by light absorption, factory calibration
Elemental, organic and Total carbon	SKC Impactor, 47 mm quartz filter	Batch – 10 L/min[c] constant flow	Modified NIOSH Method 5040 (Khan et al., 2012)

[a] LI-COR Biosciences, USA.
[b] SGX Sensortech, United Kingdom.
[c] Leland Legacy sample pump, SKC Inc., USA.
[d] TSI Inc., USA.
[e] Filter size 20.3 × 25.4 cm, Polyurethane foam (PUF) size 7.6 × 3.8 cm.
[f] Windjammer brushless direct current blower AMETEK Inc., USA.
[g] AethLabs, USA.

determined using the World Health Organization (WHO) 2005 toxic equivalent factors (TEF) (Van den Berg et al., 2006). Only four PCDD/PCDF congeners were detected in all samples; (1,2,3,4,6,7,8 – HpCDD, 1,2,3,4,6,7,8,9 – OCDD, 2,3,7,8 – TCDF, 1,2,3,4,6,7,8 – HpCDF) these emission factors were used for intercomparison purposes. These emission factors represent the low end of the absolute emission factor but are the most reliable for intercomparison.

A portion of the methylene chloride extract from the PCDD/PCDF/PAH sample was used for the PAH analysis using a modified EPA Method 8270D (2007). Labeled standards for PAHs were added to the XAD-2 trap before the sample was collected and internal standards were added before mass analysis. The PAHs TEQ emission factors were determined using TEFs by Larsen and Larsen (1998).

Ambient air background samples were collected for each of the target pollutants. Only the VOC emissions were background corrected. PCDD/PCDF, PAH and PM burn samples had over 20, 170, and 200 times higher concentrations than the ambient air background sample, respectively.

2.4. Calculations

Emission factors, expressed as mass of pollutant per mass of biomass burned, were based on the carbon balance method (Nelson, 1982). This method concurrently measures the target analyte along with the amount of fuel burned, the latter assumed to be determined by the $\Delta CO + \Delta CO_2$ measurements and assuming a 50% carbon concentration in the biomass fuel. The minor carbon mass emitted as hydrocarbons and PM is ignored without significant effect on the emission factor. The resultant emission factors are expressed as mass of pollutant per mass of biomass consumed (B_c).

The modified combustion efficiency (MCE), $\Delta CO_2/(\Delta CO_2+\Delta CO+\Delta CH_4)$ (with CH_4 included in VOC samples only), was calculated for each of the emission samples.

Custom photometric calibration factors were derived for each burn conducted for the DustTrak 8520 by simultaneous collection of $PM_{2.5}$ mass on a filter (averaged continuous $PM_{2.5}$ concentration divided by $PM_{2.5}$ by filter mass).

Single factor one-way analysis of variance (ANOVA) with a level of significance $\alpha = 0.05$ was used to determine any differences in air pollution emissions between PE covered and uncovered biomass piles. To establish significant difference the ANOVA-returned p value (significant value) has to be less than level of significance (0.05) and the F/F_{crit} value has to be greater than 1.0.

3. Results and discussion

Eleven pile burns were sampled over a five day period with emission factor results summarized in Table 3. The plumes were sampled with the aerostat/Flyer in close proximity to the fires to maximize the sample collection mass without placing operators or instruments at risk. Typical aerostat heights above the pile burn were 20–70 m. Pile emission sampling averaged 45 min. Ambient temperatures ranged from 2 to 13 °C, winds 0–32 km/h, and humidity ranged from 100% for the first two days of testing to 35–40% on the last two days. Additional meteorological data are presented in the Supporting Information.

The potential effect of day-of-testing on the results due to, for example meteorological condition changes through the week, were examined by the chronological examination of the emission factors for all targeted pollutants. This analysis is of limited utility due to the non-random order in which the tests were run. Nonetheless, no effects related to testing date, or time of day were found on the Wet/Dry $PM_{2.5}$, PAH, and PCDD/PCDF emission factors were found including the Dry PE PCDD/PCDF results. However, an effect of the testing date was found for Dry PE on the $PM_{2.5}$ emission factors and was inconclusive on the PAH results.

3.1. CO, CH_4, and CO_2

Typical concentration results throughout the duration of a Dry and Wet burns are shown in Fig. 3. Fluctuations in the

Table 3
Results.[a]

Pollutant	Unit	WET	DRY	DRY PE	DRY PE	DRY PE
			Uncovered	6.1 × 6.1 m 0.15 mm	3 × 3 m 0.15 mm	3 × 3 m 0.10 mm
CO_2[e]	g/kg B_c	1689 (36%)[b]	1785 (3.1%)[c]	1,758[d]	1,795[d]	1,756[d]
CO[e]	g/kg B_c	82 (20%)[b]	29 (112%)[c]	43[d]	22[d]	46[d]
CH_4[e]	g/kg B_c	5.7 (2.1%)[b]	1.1 (135%)[c]	2.6[d]	1.5[d]	2.0[d]
$PM_{2.5}$	g/kg B_c	18 (58%)[b]	4.5 (9.5%)[b]	6.0 (78%)[c]	5.2 (69%)[c]	3.4[d]
BC	g/kg B_c	0.47 (12%)[c]	0.24 (5.7%)[b]	0.27 (38%)[c]	0.28 (29%)[c]	0.28[d]
UVPM	g/kg B_c	0.50[d]	0.24 (6.9%)[c]	NS	0.30[d]	NS
EC	g/kg B_c	0.18 (10%)[c]	0.12 (18%)[b]	0.10 (12%)[c]	0.14 (16%)[c]	0.13[d]
OC	g/kg B_c	8.3 (9.5%) [c]	2.5 (22%)[b]	3.5 (112%)[c]	2.5 (76%)[c]	1.8[d]
TC	g/kg B_c	8.5 (9.5%) [c]	2.6 (21%)[b]	3.6 (110%)[c]	2.7 (73%)[c]	1.9[d]
OC/EC	Ratio	45 (0.6%)[c]	21 (32%)[b]	34 (104%)[c]	17 (62%)[c]	14[d]
$BC/PM_{2.5}$	Ratio	0.043 (60%)[c]	0.053 (9.2%)[b]	0.045 (1.2%)[c]	0.066 (94%)[c]	0.081[d]
$EC/PM_{2.5}$	Ratio	0.015 (39%)[c]	0.027 (22%)[b]	0.019 (67%)[c]	0.030 (55%)[c]	0.038[d]
Σ VOCs[f]	mg/kg B_c	4106 (50%)	612 (95%)[c]	1,266[d]	1,036[d]	1,255[d]
Σ PAH_{16}	mg/kg B_c	88 (10%)[b]	15 (27%)[b]	26 (118%)[c]	24 (109%)[c]	14[d]
Σ PAH – TEQ	mg B [a]P_{eq}/kg B_c	2.7 (11%)[b]	0.27 (32%)[b]	0.48 (123%)[c]	0.55 (100%)[c]	0.24[d]
Σ PCDD/PCDF	ng/kg B_c	15 (37%)[b]	5.8 (7.2%)[b]	8.0 (137%)[c]	7.6 (145%)[c]	5.1[d]
Σ PCDD/PCDF TEQ[g]	ng TEQ/kg B_c	0.18 (11%)[b]	0.077 (59%)[b]	0.14 (192%)[c]	0.066 (189%)[c]	0.057[d]
Σ 4 PCDD/PCDF congeners[h]	ng TEQ/kg B_c	0.015 (19%)[b]	0.0079 (19%)[b]	0.010 (82%)[c]	0.10 (131%)[c]	0.0077[d]

[a] Units in mass of pollutant per mass of biomass consumed (B_c). NS = No sample. Relative standard deviation (RSD) and relative percent difference (RPD) within parentheses.
[b] RSD.
[c] RPD.
[d] Single sample.
[e] Derived from SUMMA Canisters.
[f] Sum of 74 VOCs analyzed via U.S. EPA Compendium Method TO-15 (1999).
[g] Not detected congeners set to zero, results for each congener and homologue is presented in SI Tables S5–S10.
[h] For intercomparison purpose only, PCDD/PCDF congeners detected in all samples: 1,2,3,4,6,7,8 – HpCDD, 1,2,3,4,6,7,8,9 – OCDD, 2,3,7,8 – TCDF, 1,2,3,4,6,7,8 – HpCDF.

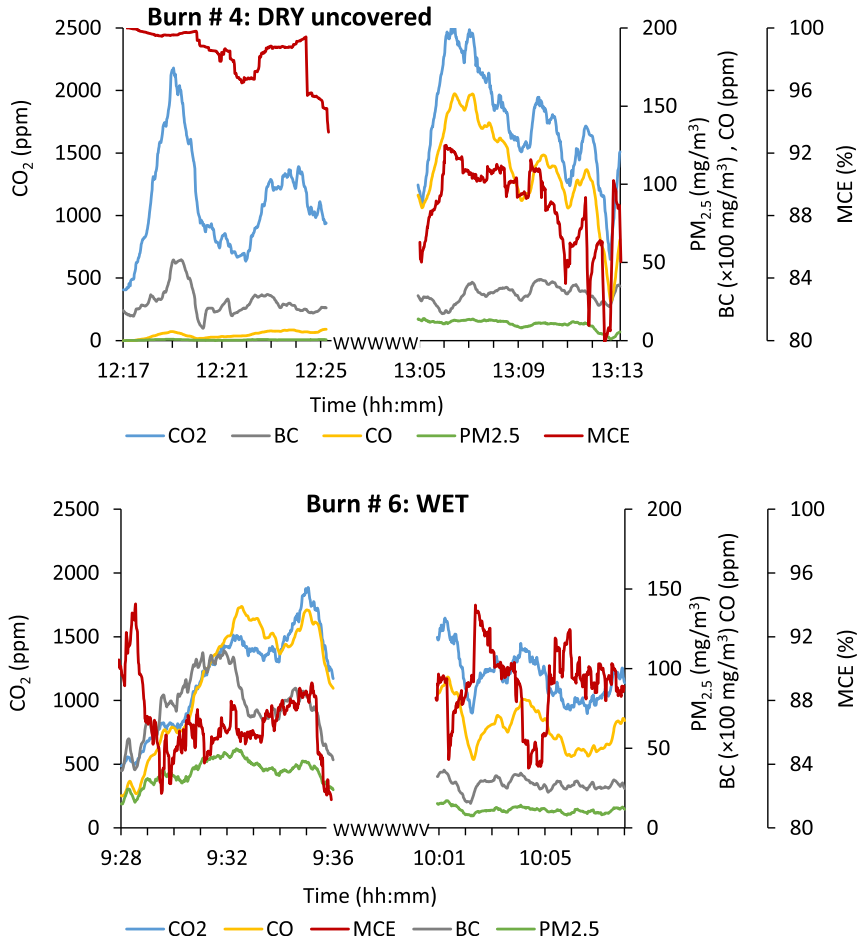


Fig. 3. Typical concentration traces of CO_2, CO, BC, $PM_{2.5}$ and modified combustion efficiency (MCE) for Dry and Wet burns. Traces displayed in 60 s moving average.

concentrations are typical and reflect wind shifts moving the Flyer in an out of the plume. The CO and CH_4 emission factors were almost twice as high for the wet piles as the dry (Table 3). Hardy (1996) estimated 1.64 and 5.52 g/kg for CH_4 from flaming and smoldering, respectively. Our work resulted in whole-burn values of 1.1 g/kg (DRY) to 5.7 g/kg (WET). The CO_2, CO and CH_4 emission factors in this study were also in the same range as found in the literature of open burning of Douglas-fir 1601–1772 g/kg, 74–138 g/kg, 0.3–7.9 g/kg[26, 27], respectively.

3.2. $PM_{2.5}$

The $PM_{2.5}$ results show a statistically significant ($F = 2.7$, $p = 0.004$) increase in the Wet (18 ± 11 g/kg B_c) versus the Dry uncovered + Dry PE covered (4.9 ± 1.8 g/kg) emission factor (Fig. 4 Inset). Individual emission factors (Fig. 4) show no distinction between the Dry uncovered and Dry PE covered piles. The $PM_{2.5}$ emission factors compare with a value of 6.75 g/kg consumed estimated from hand-pile biomass burns by Wright et al. (2010). The Wet emission factor (18 ± 11 g/kg B_c) derived at a MCE of 0.839 ± 0.057 is in the same range as found in the literature of open burning of Douglas-fir, 15.7 ± 5.2 g/kg dry fuel consumed (Urbanski et al., 2009) at a MCE of 0.916 ± 0.016.

Examination of the relationship between $PM_{2.5}$ and the MCE showed that lower combustion efficiencies were correlated with higher $PM_{2.5}$ loads. Fig. 5 shows that comparison of same-day WET and DRY samples (Day 2 and Day 3) continues to verify the distinction with the passage of time, suggesting that the non-random testing did not affect the conclusions. The distinction in the $PM_{2.5}$ emission factors occurs in the initial half of the burns. Fig. 6 shows that the early portion of the WET pile burns when the fire is getting started is responsible for the high $PM_{2.5}$ emissions. This distinction with the DRY burns persists until the second half of the burn when smoldering was more prevalent.

3.3. Black carbon, UVPM, elemental/organic carbon

BC, EC, OC, and TC values were all higher for the WET burns as compared to all of the DRY and PE burns (Fig. 7). No statistical distinctions in these values (BC, EC, OC, and TC emission factors) were observed for the varying sizes and thicknesses of PE. BC showed approximately a factor of two higher values than EC and they did not correlate strongly with each other (r^2 of 0.49, SI Fig. S1) which may be due to the low number of data points. The EC emission factor, 0.10–0.18 g/kg B_c, is in the same range as found in the literature, 0.19 ± 0.41 g/kg dry fuel, from laboratory burns of Douglas-fir (McMeeking et al., 2009). The relationship between EC and BC emission factors and MCE is shown in Fig. 8.

The OC/EC values, a surrogate for comparison of optical reflectance/warming properties, indicates values ranging between 14 and 45, the latter being the WET burns (Table 3). Values greater than unity are common and anticipated for biomass burns. These values are the opposite of what is observed with, for example, crude oil combustion (Gullett et al., 2016), where the OC/EC ratio is about 1/15.

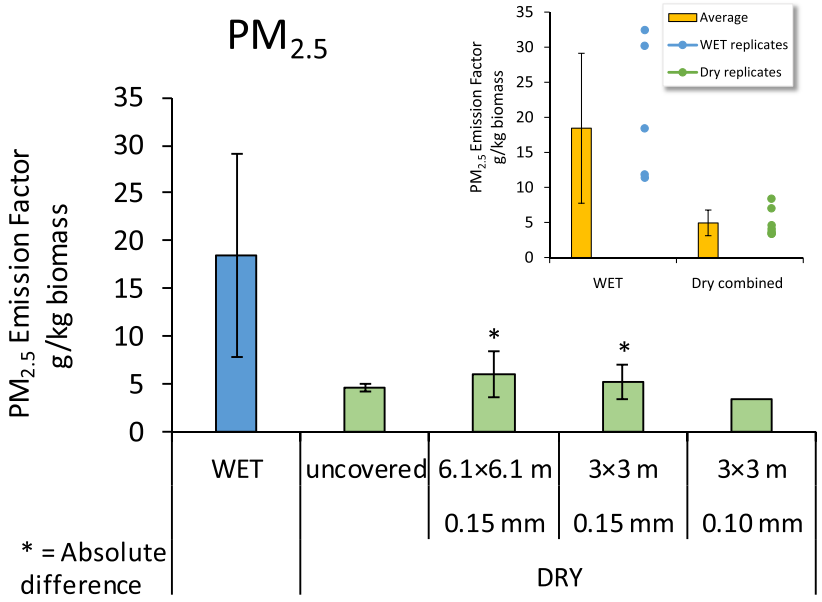


Fig. 4. $PM_{2.5}$ results. Inset chart shows Wet versus DRY (PE-covered and uncovered). Error bars represents 1 standard deviation if nothing else stated.

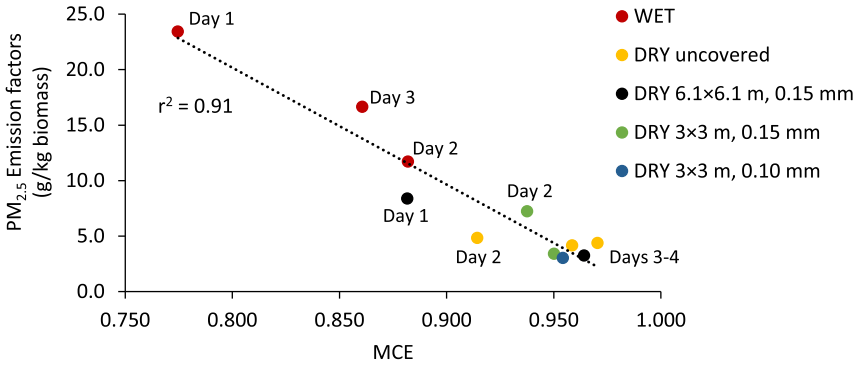


Fig. 5. The relationship between $PM_{2.5}$ emission factor and combustion quality (modified combustion efficiency, MCE).

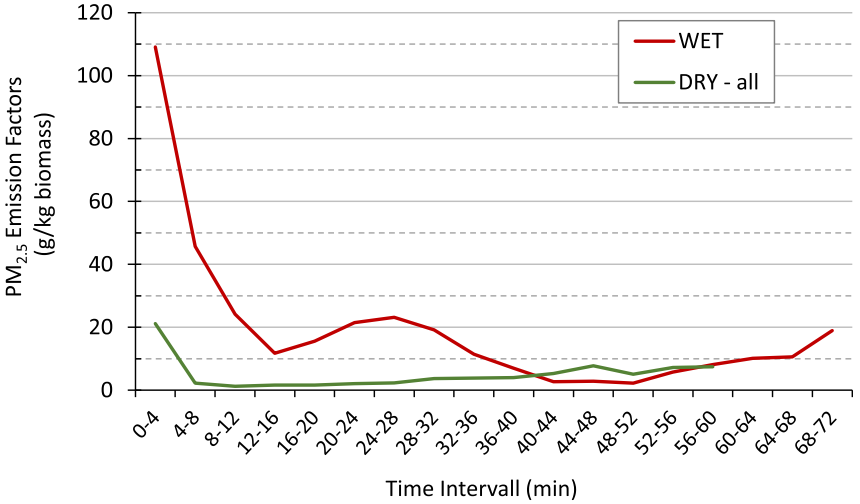


Fig. 6. Comparison of $PM_{2.5}$ emission factors at 4 min intervals throughout the burn durations, comparing the combined WET and combined DRY results.

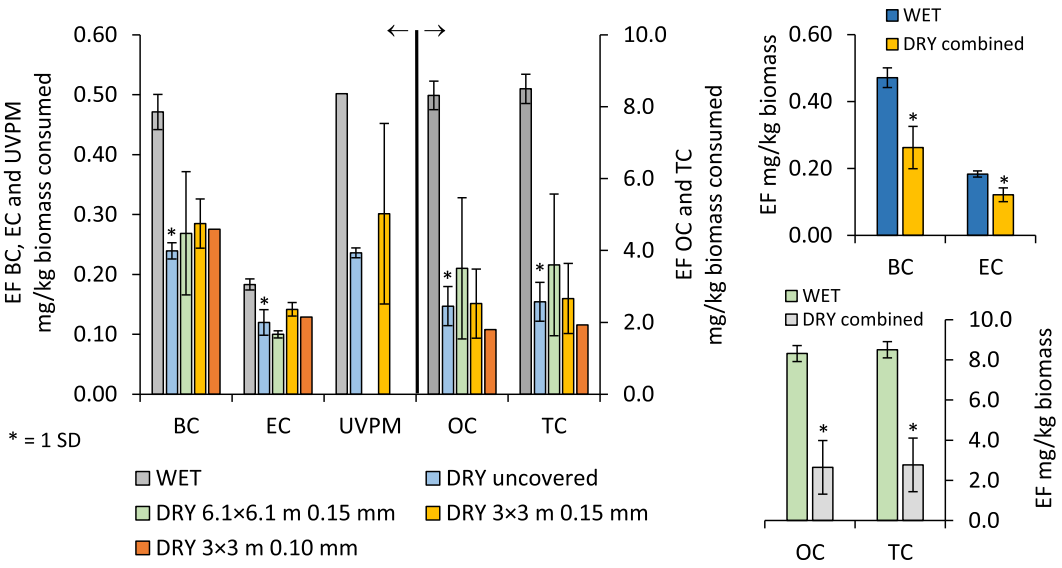


Fig. 7. BC, EC, UVPM, OC and TC results. Inset chart shows Wet versus DRY (PE-covered and uncovered). Error bars represents absolute difference if nothing else stated.

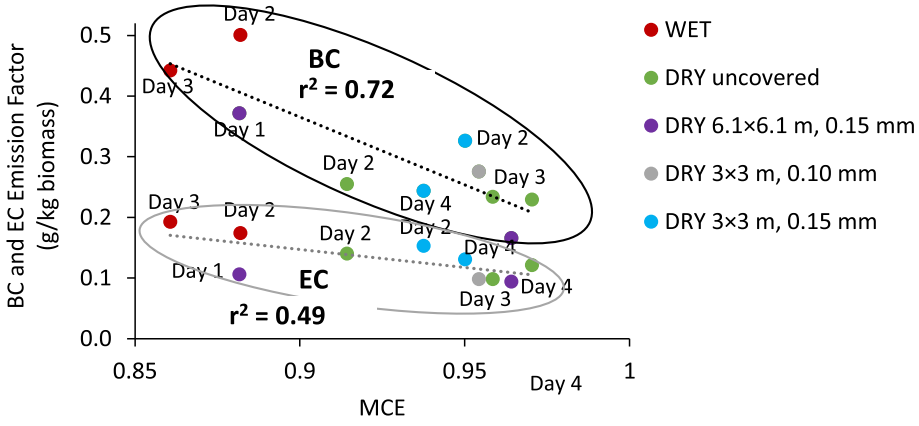


Fig. 8. BC and EC in relationship to modified combustion efficiency (MCE).

3.4. Volatile organic compounds (VOCs)

VOC results for the most concentrated species are shown in Table 4. The full set of VOC emission factors are summarized in Supporting Information, Tables S11–S13. ANOVA analysis (Fig. 9) of acrolein, benzene, styrene and 1,3-butadiene showed statistical differences between WET and DRY piles, (Benzene F = 1.6, p = 0.0208; Acrolein F = 3.3, p = 0.004; Styrene F = 1.9, p = 0.015; 1,3-Butadiene F = 1.4, p = 0.026). Benzene is a common VOC associated with incomplete combustion. Acrolein is a toxic, irritant, 3-C carbonyl and is not listed as a carcinogen on EPA or international lists. 1,3-butadiene is listed as a human carcinogen. Styrene is "reasonably anticipated to be a human carcinogen" (The U.S. Department of Health and Human Services Public Health Service (2011)). The relationship between emission factors for these select VOCs and MCE is shown in Fig. 10.

3.5. PCDD/PCDF

Results for PCDD/PCDF emission factors for Dry, Wet, and PE are summarized in Table 3. Fig. 11 presents data for four of the 17 congeners that comprise the PCDD/PCDF TEQ value (Van den Berg et al., 2006) that were present in all 11 samples (complete data are shown in SI Tables S5–S10). As such, these emission factors represent the low end of the absolute emission factor but are the most reliable in terms of intercomparisons. Wet PCDD/PCDF values are higher than Dry uncovered piles [F = 2.0, p = 0.017]. Dry and PE values show no statistical difference between them [F = 0.01, p = 0.814]. Within the PE grouping, no distinction was observed between the PE sheet size and thickness, although the limited number of tests limits the statistical power of this test.

Fig. 12 examines the effect of combustion quality as measured by MCE on the PCDD/PCDF emission factors. Three distinct groupings of emission factors for Dry, Wet, and PE are indicated. While Wet results show no apparent trend with MCE, PE results suggest that PCDD/PCDF emission factors decline with increased MCE ($r^2 = 0.93$). This is similar to observations for both $PM_{2.5}$ and select VOCs. Evaluation of the whole data set shows an $r^2 = 0.82$ with declining emission factor and MCE. Additional data are necessary to verify these MCE indications, although this trend is consistent with historical observations that equate improved combustion conditions with decreased PCDD/PCDF emissions.

These four-congener PCDD/PCDF emission factors are approximately ten times lower than four-congener literature values of 0.11–0.22 ng TEQ/kg B_c from open burning of pine savannas (Aurell and Gullett, 2013; Aurell et al., 2015).

Table 4
VOC result.

Compound	WET[a]	DRY uncovered[b]	DRY PE 3 × 3 m 0.10 mm	DRY PE 3 × 3 m 0.15 mm	DRY PE 6.1 × 6.1 0.15 mm
	mg/kg biomass consumed				
Benzene[c]	757 ± 416	115 (74%)	216	289	222
Propene	682 ± 373	119 (107%)	252	199	250
Acetone	668 ± 280	32	163	78	ND
Acrolein[c]	463 ± 168	97 (101%)	134	99	180
Vinyl Acetate[c]	309 ± 133	52 (116%)	78	51	134
Toluene[c]	297 ± 172	52 (109%)	100	98	116
1,3-Butadiene	231 ± 136	31 (100%)	78	71	74
2-Butanone (MEK)	156 ± 76	27 (137%)	49	21	72
Styrene[c]	111 ± 59	16 (104%)	25	33	35
Acetonitrile	69 ± 40	17 (119%)	34	12	38
m,p-Xylenes[c]	68 ± 41	13 (136%)	22	15	27
Ethylbenzene	43 ± 26	7.5 (107%)	14	12	15
alpha-Pinene	41 ± 31	8.7 (120%)	17	17	14
D-Limonene	31 ± 21	6.7 (117%)	8.7	12	13
Acrylonitrile[c]	27 ± 14	6.0 (50%)	12	7.0	11
o-Xylene[c]	23 ± 14	4.4 (145%)	8.0	4.5	9.1
1,2,4-Trimethylbenzene	12 ± 5.8	2.4 (143%)	3.8	1.9	4.2
1,3,5-Trimethylbenzene	3.5 ± 1.6	1.2	1.2	0.49	1.2

[a] Range of data equal one standard deviation.
[b] Range of data equals relative percent difference.
[c] On U.S. EPA's list of hazardous air pollutants (2008). The VOCs shown here were selected based on the number of samples detectable above three times the detection limit and their relevance to the EPA's list of hazardous air pollutants list and their role as greenhouse gas/ozone precursors. Full list of the 74 analyzed VOCs and their emission factors are presented in SI Tables S11–S12.

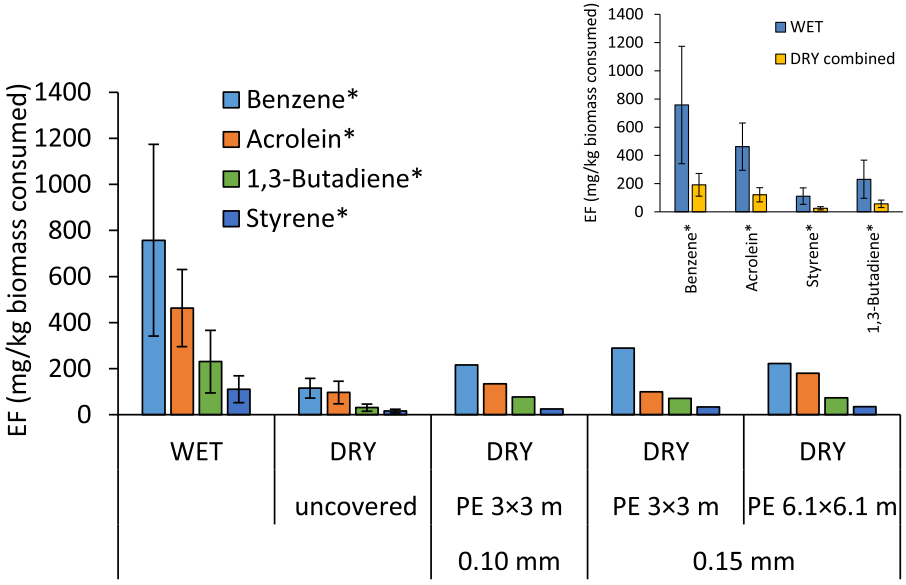


Fig. 9. VOC results. Error bars represent one standard deviation for WET burns and DRY combined burns, and absolute difference for DRY uncovered burns. * = On U.S EPA's list of hazardous air pollutants.

3.6. PAHs

Individual PAH emission factors (for the 16 EPA PAHs) are shown in Table 5 and Sum of the 16 EPA PAHs are shown in Fig. 13. Similar to observations of $PM_{2.5}$, select VOCs, and PCDD/PCDF, Wet piles resulted in greater emissions (statistically significant, $F = 14.3$, $p < 0.0001$), by a factor of 4–5. No distinction was observed, however, between any of the Dry (cover and uncovered) PAH emission factors. These emission factors compared to a value of 28 mg/kg burning Douglas-fir in a laboratory setting (Jenkins et al., 1996).

The PAH measurements reflect both gas phase and particle-bound PAH compounds. The relationship between the emission factors for $PM_{2.5}$ and PAHs were examined in Fig. 14. Predictably higher $PM_{2.5}$ is associated with higher PAHs.

The relationship between PAHs and combustion quality (MCE) is shown in Fig. 15. As with previous emissions, lower combustion quality (MCE) is associated with higher PAH emissions. All of the Wet results have the lowest MCE and highest PAH levels.

4. Comparison with others' data

Comparison of our results with previously compiled data on open pile burning of woody biomass from twelve sources (Springsteen et al., 2011) places our data within the range of reported results. Literature values for PM (total) ranged from 3 to

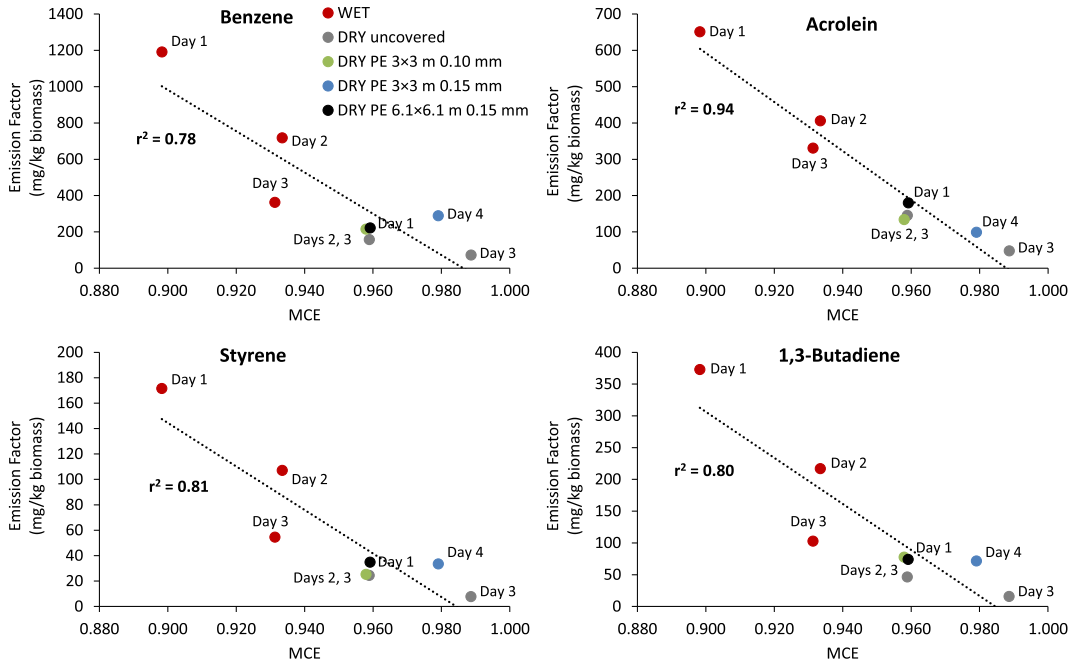


Fig. 10. The effect of modified combustion efficiency (MCE) on select VOC emission factors.

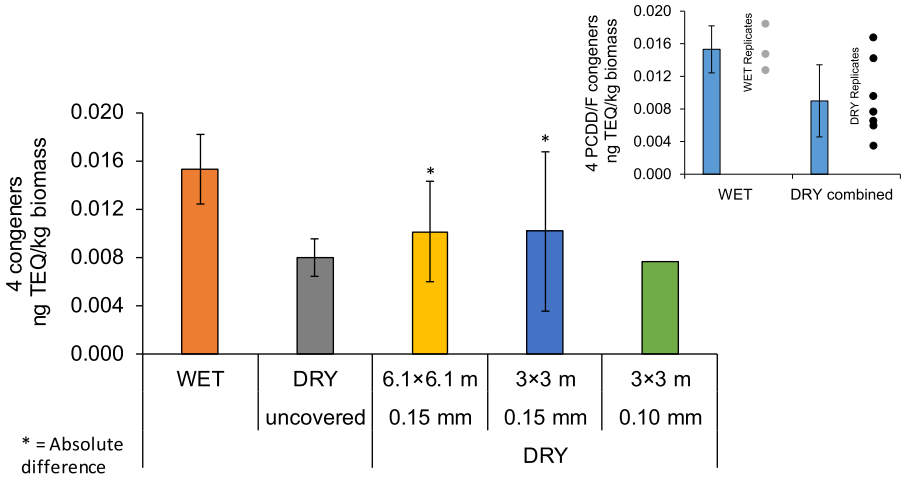


Fig. 11. PCDD/PCDF emission factors in ng TEQ/kg biomass consumed. Error bars represent 1 standard deviation if nothing else stated.

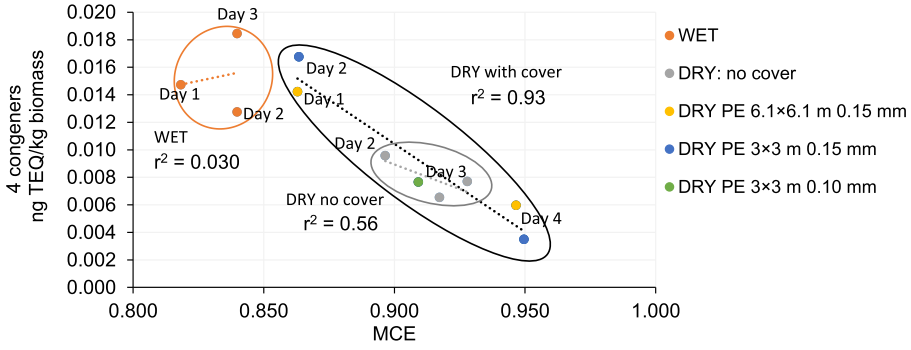


Fig. 12. PCDD/PCDF emission factors in ng TEQ/kg biomass consumed by group versus MCE.

22 g/kg dry biomass burned whereas our results were 3–18 g/kg B_c (these units are similar but derived differently). Likewise, reported CO emission factors were 17–164 g/kg in comparison to our results of 22–82 g/kg B_c. CH_4 values were reported at 0.9–11 g/kg versus

Table 5
PAH emission factors.

PAHs	WET[a]	DRY[a]	DRY PE[b]	DRY PE[b]	DRY PE[c]
		Uncovered	6.1 × 6.1, 6 mm	3 × 3, 6 mm	3 × 3, 4 mm
	mg/kg biomass consumed				
Naphthalene	17 (3.4%)	4.4 (37%)	8.1 (101%)	7.4 (109%)	5.0
Acenaphthylene	16 (14%)	2.5 (24%)	4.6 (129%)	4.1 (106%)	2.3
Acenaphthene	1.6 (21%)	0.34 (24%)	0.60 (135%)	0.46 (117%)	0.27
Fluorene	6.4 (35%)	0.97 (27%)	1.7 (132%)	1.5 (122%)	0.75
Phenanthrene	19 (20%)	3.3 (26%)	4.8 (128%)	4.5 (113%)	2.5
Anthracene	4.1 (15%)	0.65 (28%)	1.0 (127%)	0.98 (113%)	0.50
Fluoranthene	6.9 (3.4%)	0.90 (30%)	1.4 (117%)	1.6 (107%)	0.76
Pyrene	6.2 (10%)	0.78 (31%)	1.3 (118%)	1.5 (102%)	0.68
Benzo(*a*)anthracene	2.1 (10%)	0.24 (28%)	0.43 (128%)	0.44 (109%)	0.20
Chrysene	2.5 (10%)	0.38 (24%)	0.61 (123%)	0.58 (111%)	0.30
Benzo(*b*)fluoranthene	1.3 (14%)	0.13 (28%)	0.24 (123%)	0.25 (102%)	0.11
Benzo(*k*)fluoranthene	1.7 (6.9%)	0.16 (35%)	0.29 (121%)	0.34 (94%)	0.15
Benzo(*a*)pyrene	1.7 (12%)	0.16 (33%)	0.29 (124%)	0.34 (98%)	0.14
Indeno (1,2,3-*cd*)pyrene	0.84 (12%)	0.073 (38%)	0.13 (119%)	0.17 (93%)	0.067
Dibenz (*a*,*h*)anthracene	0.20 (14%)	0.021 (28%)	0.037 (126%)	0.041 (102%)	0.022
Benzo (*ghi*)perylene	0.98 (14%)	0.086 (38%)	0.15 (117%)	0.21 (90%)	0.079
SUM 16-EPA PAH	**88 (11%)**	**15 (27%)**	**26 (118%)**	**24 (109%)**	**13.8**

[a] Range of data within parentheses equals relative standard deviation.
[b] Range of data within parentheses equals relative percent difference.
[c] Single sample.

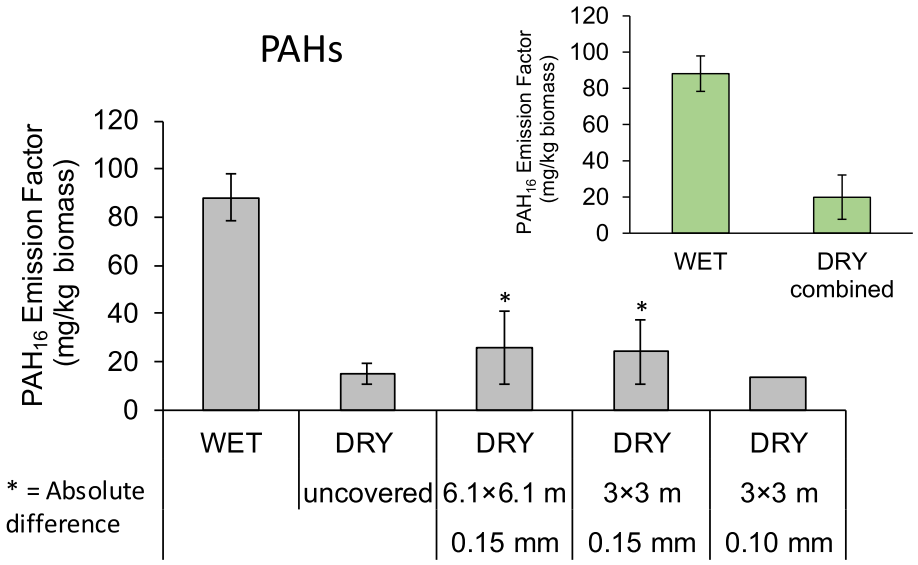


Fig. 13. Average PAH emission factors for each category. Error bars represent 1 standard deviation if nothing else stated.

ours at 1–6 g/kg B_c. Few other pollutants for field pile burns are characterized in the literature.

A laboratory study by Hosseini et al. (2014) looked at emissions from burning forest debris (manzanita) with and without PE addition, showing no effect of the added PE on emissions. Our dry pile results for PM emissions (5.2 ± 2.4 g/kg B_c) spanned theirs (4.5 ± 0.43 g/kg biomass). Our OC and benzene results were slightly higher (2.6 ± 1.3 g/kg B_c and 192 ± 81 mg/kg B_c, respectively) versus those in the laboratory study (1.7 ± 0.06 g/kg biomass and 174 ± 21 mg/kg biomass, respectively). More extensive comparisons are limited by differences in biomass type and MCE (the laboratory burns state a MCE of 0.98–0.99 versus the fields' MCE of 0.86–0.95).

5. Conclusion

Field sampling of eleven biomass pile burns determined emission factors for a wide range of pollutants. Comparison of piles that were naturally wetted versus those that were dry showed statistically higher emission factors for $PM_{2.5}$, PAHs, VOCs, and PCDD/PCDF for the wet piles. Emission levels were negatively correlated with combustion quality as represented by MCE. Variation of PE cover size and thickness showed no statistically significant difference in emission factor for any of the pollutants suggesting that the PE was not contributing significantly to any of the measured pollutants. Time-resolved $PM_{2.5}$ emissions were highest at the beginning of the burns; for the Dry pile tests, this startup period lasted

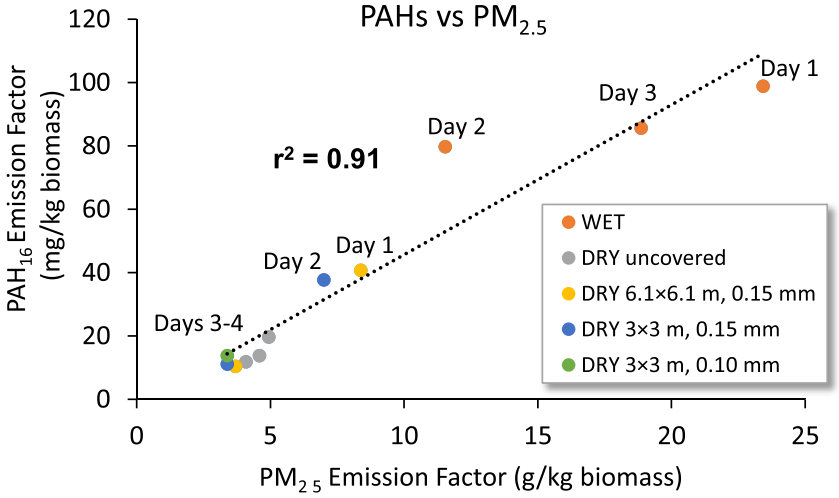


Fig. 14. Comparison of PAH emission factors and $PM_{2.5}$ emission factors.

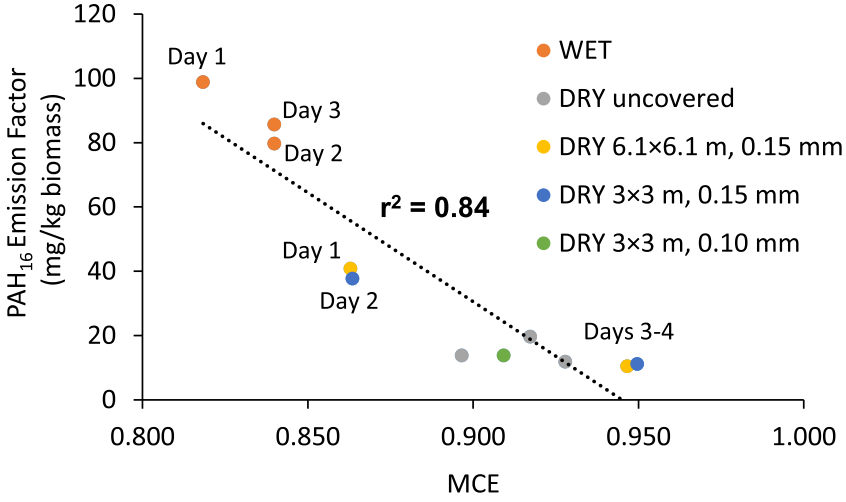


Fig. 15. Comparison of PAH emission factors with modified combustion efficiency (MCE).

for less than 4 min; for the Wet pile tests, it was four times longer, about 16 min. For the Wet pile tests, $PM_{2.5}$ emission factors were higher than those of the Dry pile tests for at least half of the burn durations, after which they were similar. These tests suggest that use of PE as a biomass pile cover results in lower emission factors than those from piles exposed to moisture, reducing pollutant levels during slash pile burns. These emission factors, together with estimates of burn pile numbers, size, and fuel consumption, can be used by management and regulatory communities to minimize smoke impacts while limiting the potential hazard of biomass fuel loading.

Acknowledgements

The authors appreciate the site access and cooperation of Jerry Anderson, the test site manager for Hancock Timber Resources. Jeff Classen and Gail Culbertson, both of the Dallas Unit of Western Oregon ODF District, provided fire duties, transportation, and logistical support. Sean Riordan and Paul Davies (ATA Aerospace) along with Tracy Gerber, US Air Force Research Laboratory (Kirtland AFB) provided aerostat flight operations. Sue MacMillan, Brian Finneran, and Anthony Barnack of the Oregon Department of Environmental Quality provided technical support on toxics and emissions. David Weise (Pacific SW Research Station), Roger Ottmar (Pacific NW Research Station), Shawn Urbanski (Missoula Fire Laboratory), and Harold Merritt (Plum Creek Timber) provided technical support. This work was funded by the Oregon Department of Forestry and the U.S. EPA Office of Research and Development through a Cooperative Research and Development Agreement, #868-15.

The views expressed in this article are those of the authors and do not necessarily reflect the views or policies of the U.S. EPA. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.atmosenv.2016.11.034.

References

40 CFR Part 50, Appendix L. Reference method for the determination of particulate matter as PM2.5 in the Atmosphere, App. L. 1987.
Aurell, J., Gullett, B.K., 2013. Emission factors from aerial and ground measurements

of field and laboratory forest burns in the southeastern US: PM2.5, black and brown carbon, VOC, and PCDD/PCDF. Environ. Sci. Technol. 47 (15), 8443–8452.
Aurell, J., Gullett, B.K., Pressley, C., Tabor, D., Gribble, R., 2011. Aerostat-lofted instrument and sampling method for determination of emissions from open area sources. Chemosphere 85, 806–811.
Aurell, J., Gullett, B.K., Tabor, D., 2015. Emissions from southeastern U.S. Grasslands and pine savannas: comparison of aerial and ground field measurements with laboratory burns. Atmos. Environ. 111 (0), 170–178.
Cross, J.C., Turnblom, E.C., Ettl, G.J., 2013. Biomass Production on the Olympic and Kitsap Peninsulas, Washington: Updated Logging Residue Ratios, Slash Pile Volume-to-weight Ratios, and Supply Curves for Selected Locations. USDA, For. Serv., Pacific Northwest Research Station, Portland, Oregon. Gen. Tech. Rep. PNW-GTR-872.
Gullett, B.K., Aurell, J., Holder, A., Mitchell, W., Greenwell, D., Hays, M., Conmy, R., Tabor, D., Preston, W., George, I., Abrahamson, J.P., Vander Wal, R., Holder, E., 2016. Characterization of Emissions and Residues from Simulations of the Deepwater Horizon Surface Oil Burns. Submitted Manuscript.
Hardy, C.C., 1996. Guidelines for Estimating Volume, Biomass and Smoke Production for Piled Slash. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, OR, p. 17.
Hosseini, S., Shrivastava, M., Qi, L., Weise, D.R., Cocker, D.R., Miller, J.W., Jung, H.S., 2014. Effect of low-density polyethylene on smoke emissions from burning of simulated debris piles. J. Air & Waste Manag. 64 (6), 690–703.
Jenkins, B.M., Jones, A.D., Turn, S.Q., Williams, R.B., 1996. Emission factors for polycyclic aromatic hydrocarbons from biomass burning. Environ. Sci. Technol. 30 (8), 2462–2469.
Khan, B., Hays, M.D., Geron, C., Jetter, J., 2012. Differences in the OC/EC ratios that characterize ambient and source aerosols due to thermal-optical analysis. Aerosol Sci. Technol. 46 (2), 127–137.
Larsen, J.C., Larsen, P.B., 1998. Chemical carcinogens. In: Hester, R.E., Harrison, R.M. (Eds.), Air Pollution and Health. The Royal Society of Chemistry, Cambridge, UK, pp. 33–56.
McMeeking, G.R., Kreidenweis, S.M., Baker, S., Carrico, C.M., Chow, J.C., Collett, J.L., Hao, W.M., Holden, A.S., Kirchstetter, T.W., Malm, W.C., Moosmuller, H., Sullivan, A.P., Wold, C.E., 2009. Emissions of trace gases and aerosols during the open combustion of biomass in the laboratory. J. Geophys. Res.-Atmos. 114.
Nelson Jr., R.M., 1982. An Evaluation of the Carbon Balance Technique for Estimating Emission Factors and Fuel Consumption in Forest Fires. U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station, Asheville, NC, USA. Research Paper SE-231.
Oregon Department of Forestry, 2014. Smoke Management Rules: Best Burn Practices; Emission Reduction Techniques. Oregon Department of Forestry and Department of Environmental Quality. Division 48: OAR 629-048-0210.
Springsteen, B., Christofk, T., Eubanks, S., Mason, T., Clavin, C., Storey, B., 2011. Emission reductions from woody biomass waste for energy as an alternative to open burning. J. Air & Waste Manage. 61 (1), 63–68.
The U.S. Department of Health and Human Services, Public Health Service, June 10, 2011. National Toxicology Program. Report on Carcinogens, twelfth ed. http://www.iaff.org/HS/PDF/12th%20Report%20on%20Carcinogens%20-%202011.pdf (Accessed November 2016).
Trofymow, J.A., Coopes, N.C., Hayhurts, D., 2014. Comparison of remote sensing and ground-based methods for determining residue burn pile wood volumes and biomass. Can. J. For. Res. 44, 182–194.
U.S. EPA Compendium Method TO-15, 1999. Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-prepared Canisters and Analyzed by Gas Chromatography/mass Spectrometry (GC/MS). http://www.epa.gov/ttnamti1/files/ambient/airtox/to-15r.pdf (Accessed November 10, 2015).
U.S. EPA Compendium Method TO-9A, 1999. Determination of Polychlorinated, Polybrominated and Brominated/chlorinated Dibenzo-p-dioxins and Dibenzofurans in Ambient Air. http://www.epa.gov/ttnamti1/files/ambient/airtox/to-9arr.pdf (Accessed November 21, 2012).
U.S. EPA Hazardous Air Pollution List, 2008. Clean Air Act: Title 42-The Public Health and Welfare. U.S. Government Printing Office, p. 5713. http://www.gpo.gov/fdsys/pkg/USCODE-2008-title42/pdf/USCODE-2008-title42-chap85.pdf (Accessed May 5 2014).
U.S. EPA Method 10A. Determination of carbon monoxide emissions from stationary sources. https://www3.epa.gov/ttnemc01/promgate/m-10a.pdf (Accessed May 11, 2016).
U.S. EPA Method 205, 2014. Verification of Gas Dilution Systems for Field Instrument Calibrations. http://www.epa.gov/ttn/emc/promgate/m-205.pdf (Accessed June 17, 2015).
U.S. EPA Method 23, 1991. Determination of Polychlorinated Dibenzo-p-dioxins and Polychlorinated Dibenzofurans from Stationary Sources, 40 CFR Part 60, Appendix A. http://www.epa.gov/ttn/emc/promgate/m-23.pdf (Accessed November 10, 2015).
U.S. EPA Method 25C. Determination of nonmethane organic compounds (NMOC) in landfill gases. http://www.epa.gov/ttn/emc/promgate/m-25c.pdf (Accessed May 11, 2016).
U.S. EPA Method 3A, 1989. Determination of Oxygen and Carbon Dioxide Concentrations in Emissions from Stationary Sources (Instrumental Analyzer Procedure). http://www.epa.gov/ttn/emc/promgate/m-03a.pdf (Accessed May 5, 2014).
U.S. EPA Method 8270D, 2007. Semivolatile Organic Compounds by Gas Chromatography/mass Spectrometry (GC/MS). https://www.epa.gov/sites/production/files/2015-07/documents/epa-8270d.pdf (Accessed August 17, 2016).
U.S. EPA Method 8290A, 2007. Polychlorinated Dibenzo-p-dioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High-resolution Gas Chromatography/high-resolution Mass Spectrometry (HRGC/HRMS). http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/8290a.pdf (Accessed November 21, 2012).
Urbanski, S.P., Hao, W.M., Baker, S., 2009. Chemical composition of wildland fire emissions. In: Bytnerowicz, A., Arbaugh, M., Riebau, A., Andersen, C. (Eds.), Developments in Environmental Science, vol. 8, pp. 79–107.
Van den Berg, M., Birnbaum, L.S., Denison, M., De Vito, M., Farland, W., Feeley, M., Fiedler, H., Hakansson, H., Hanberg, A., Haws, L., Rose, M., Safe, S., Schrenk, D., Tohyama, C., Tritscher, A., Tuomisto, J., Tysklind, M., Walker, N., Peterson, R.E., 2006. The 2005 World Health Organization reevaluation of human and mammalian toxic equivalency factors for dioxins and dioxin-like compounds. Toxicol. Sci. 93 (2), 223–241.
Ward, D.E., Hardy, C.C., Sandberg, D., Reinhardt, T., 1989. Mitigation of Prescribed Fire Atmospheric Pollution through Increased Utilization of Hardwood, Piles Residues, and Long-needled Conifers. Part III: Emissions Characterization. U.S. Department of Energy, U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Seattle, WA, p. 97. Final Report, interagency agreement DA-AI179-85BP 18509.
Wright, C.S., Balog, C.S., Kelly, J.W., January 2010. Estimating Volume, Biomass, and Potential Emissions of Hand-piled Fuels. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. Gen. Tech. Rep. PNW-GTR-805.
Yokelson, R.J., Griffith, D.W.T., Ward, D.E., 1996. Open-path Fourier transform infrared studies of large-scale laboratory biomass fires. J. Geophys. Res.-Atmos. 101 (D15), 21067–21080.