

## **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. 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 or reduce emissions by encouraging cost-effective utilization of forestland biomass, alternatives to burning, and 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 Smoke Sensitive Receptor Areas (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.

- 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

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higher level but all forestland owners and managers must comply with various aspects of the program.

- C. Smoke Management Forecasts and Instructions: To minimize the amount of smoke entering SSRAs, as described in OAR 629-048-0140, and other areas sensitive to smoke (OAR 629-048-0005(22)). The Smoke Management forecast unit issues forecasts and instructions for daily burn operations 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.

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 and possible, an updated forecast shall be issued if significant changes from the issued forecast have occurred or are expected. Updated forecasts will normally be issued before 8:00 a.m.

    - Dissemination. Forecasts shall be disseminated by e-mail and made available on the Oregon Department of Forestry web site (<http://www.oregon.gov/ODF/Fire/Pages/Burn.aspx>). The Western Oregon forecast shall also be placed on a telephone message recording.
    - 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.
  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 minimize smoke impacts. In areas of Level 2 regulation, the information may be considered an advisory, but adherence is

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strongly encouraged and burn bosses should use the forecasts and instructions to minimize the possibility of drifting smoke into SSRAs.

- 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.
- 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 OAR 629-048-0135 and OAR 629-048-0137. SPZ maps are found in Appendix 5.
- 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. Forestland burning will be limited to units that are not expected to worsen air quality within the area covered by the ASA. Similar restrictions shall apply for areas for which an air quality advisory has been issued by DEQ.
- 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.
- For forestland included in Level 2 regulation, (OAR 629-048-0005(20)), compliance with the Smoke Management instructions is encouraged. 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 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

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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 minimize smoke 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 greater than 2000 tons, the Smoke Management forecaster will, workload permitting, prepare a forecast specific to the unit being burned.
- E. Monitoring: The State Forester shall monitor prescribed burning operations 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 using available observation methods. In the case of aerial monitoring a form is provided in Appendix 4. For some areas, near real-time data from cameras and DEQ air quality monitors 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.
- 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.

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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.

- 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.

- H. Smoke Impacts: There are two types of smoke impacts, smoke intrusions of smoke into SSRAs and smoke incidents. For two Class I Areas, Kalmiopsis Wilderness and Crater Lake National Park, extra effort (use of test fires or balloon releases to check wind direction or coordinating with the duty forecaster) is needed to minimize smoke impacts from the main plume of a prescribed burn. If a complaint is received, or district personnel become aware of a smoke intrusion or smoke incident, the District Forester shall assign a qualified individual to investigate and document the findings.

1. Smoke incidents: The verified entry of smoke from prescribed burning at ground level into –
  - “Class I Areas” at levels at or above  $70\mu\text{g}/\text{m}^3$  for 1 hour duration or  $26\mu\text{g}/\text{m}^3$  for a 24-hour duration (midnight – midnight).
  - “Populated areas that are not designated as SSRAs” at levels at or above  $70\mu\text{g}/\text{m}^3$  for 1 hour duration or  $26\mu\text{g}/\text{m}^3$  for a 24-hour duration (midnight – midnight).
  - Smoke Sensitive Receptor Areas that are below the level of a smoke intrusion.

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All the incidents above 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.

2. Smoke Intrusions (OAR 629-048-0110): An intrusion occurs when verified smoke from prescribed burning enters an SSRA at levels defined in OAR 629-048-0005 (27). For every smoke intrusion, the source of the impact, the duration, and the magnitude of the intrusion will be determined, if possible. Magnitude shall be determined using DEQ monitoring particulate matter (PM) readings when available or estimated from the reduction of visibility in the smoke intrusion or smoke incident area.

When/where DEQ monitoring network PM readings are available, smoke incidents or smoke intrusions will be characterized based on PM values averaged over a one-hour period, or a 24-hour period from midnight to midnight.

- Visibility: If no DEQ monitoring network PM data is available, or if smoke impacting a community is not observed by a PM DEQ monitor, the short-term (hourly) impact may be estimated from a reduction of the prevailing visibility. Distinguishing between a smoke intrusion or a smoke incident based on visibility estimates shall be characterized as follows:

**SMOKE INTRUSION/INCIDENT CLASSIFICATION BASED ON VISIBILITY REDUCTION (RV)  
(For instructions on estimation of visibility see Appendix 2)**

Baseline Visibility (Miles)*	INTRUSION VS INCIDENT	
	INCIDENT	INTRUSION
>50	RV ≥ 4.6	RV < 4.6
25 - 50	RV ≥ 4.4	RV < 4.4
20 - 24	RV ≥ 4.1	RV < 4.1
15 - 19	RV ≥ 3.8	RV < 3.8
10 - 14	RV ≥ 3.5	RV < 3.5
5 - 9	RV ≥ 2.5	RV < 2.5
3 - 4	RV ≥ 1.8	RV < 1.8
1 - 2	RV ≥ 0.5	RV < 0.5
< 1	-	RV = 0

\*Baseline visibility is based on optimal visibility with 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, rain, fog, etc.)

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### 3. Smoke Intrusion Reporting:

- Smoke Management forecaster(s) will notify DEQ when they become aware of smoke entering an SSRA at levels reaching intrusion criteria (OAR 629-048-0005(27)) and initiate an investigation of the cause. Investigation will include notifying responsible parties. Field administrators must inform the forecaster as soon as they become aware of impacts.
- Smoke intrusion reports shall be prepared for all smoke intrusions. The report consists of two sections. The first section is completed by the Smoke Management forecaster within two business days and submitted to the burn boss or district forester for completion. The report is then returned to Smoke Management within two business days. Upon finalization the report is distributed to interested agencies. A report format is provided in Appendix 2.
- Smoke intrusions that meet or exceed the 24-hour average PM<sub>2.5</sub> value of 35 micrograms per cubic meter (National Ambient Air Quality Standard) exceedance will be reported to Smoke Management and DEQ as soon as possible, but no later than one business day after the burn is completed. Reporting of NAAQS exceedances 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, along with the agency or entity responsible for the intrusion and agree to what preventative actions will be taken.

- 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:

- Respond to the complainant in a timely manner.
- Follow up with appropriate action to the satisfaction of the District Forester.
- 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

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area office and the Salem Smoke Management unit.

- 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 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.
- 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.
  - 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, duration, magnitude, location, scope, and origin of the smoke.
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.
- 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.
  - Observations, notes, and evidence (if appropriate) shall be made/collected in order to make the following determinations:
    - 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?

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*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. 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 duration, magnitude, and frequency of impact from forestland prescribed burning.
    - 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.
    - The results of objective measurements, monitoring, or study efforts.
    - Burning programs/plans for areas that could drift smoke into the area.
    - Geographic factors that would tend to funnel smoke into the area.
    - Population and trends for population growth within the community under consideration.
    - Impact on prescribed burning programs in the surrounding area.
    - Probability of the area exceeding National Ambient Air Quality Standards due to potential prescribed burning smoke impacts.

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- Consideration for other air quality improvement projects ongoing or planned for the area.
- 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:
    - The purpose and importance of prescribed burning,
    - The health risks of wildfire and prescribed fire smoke,
    - Recommendations for the public and vulnerable populations to reduce their exposure to smoke,
    - How local officials and the public can find out about current and upcoming prescribed burns planned in their area, and
    - 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 that SSRAs which 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 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 description of populations in an SSRA community that are vulnerable to the health effects of short-term smoke;

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- 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;
  - Adequate options for protecting the health of vulnerable populations (or helping such populations to protect themselves) from short-term exposure to smoke; and
  - 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.
3. SSRA communities that develop a community response plan and program may request an exemption to the one-hour average 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).
4. SSRA communities with an approved 1-hr exemption are required to submit an annual report in conjunction with the local health authority that includes:
- A summary of methods used to communicate to the public and vulnerable populations;
  - A log of dates and times the community initiated their response plan;
  - A record of local meetings to discuss or update the community response plan.
- "Initiated response plans" means notifications and/or alerts to the public about prescribed fire smoke that impacted, or was expected to impact, the SSRA at 1 hour PM<sub>2.5</sub> levels of 70µg/m<sup>3</sup> or higher.
- 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:
- Determining total pre-burn fuel tonnage load.
  - Determining average pre-burn duff depth, litter depth and type.
  - Computing woody fuel consumption using available tools developed to predict woody fuel consumption.

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- Calculating and adding duff and litter consumption.
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.
- 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://smkmgmt.com/weather/tools/fuel\\_loading/fuel\\_loading\\_tool\\_1.php](http://smkmgmt.com/weather/tools/fuel_loading/fuel_loading_tool_1.php)
  - Digital Photo Series and other estimation aids may be accessed through ODF Smoke Management web pages.
  - 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:
- 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 Piled Fuels Biomass Emissions web application (<https://depts.washington.edu/nwfire/piles/>), BlueSky Playground, Consume, or through manual calculations.
  - 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, USFS.
  - 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.

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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](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 late September through 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, 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.

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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 Plan, including this 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. As needed, minor updates will be made to this directive and jointly reviewed by both ODF and DEQ to account for any operational changes.

**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: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

By: \_\_\_\_\_  
Title: \_\_\_\_\_  
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, other federal lands, private ownership, and state or local 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 are highlighted later in this Appendix. 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 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 business day of the week following the burn.

Procedures:

A. For private, local and state government burning:

1. A unit registration is entered into the data system for each burn unit. Information to be entered is contained in Reporting System Coding Sheet (Part 1). These data are entered into the data system at the local ODF field office. The ODF 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 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. Burning on Level 2 regulated lands must be entered into the data system no later than the first business day of the week following the burn.
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. Federal agencies will have one to two account holders per area who will enter directly into the Oregon Smoke Management Database (OSMD). The primary unit identifier shall be the E-notification number obtained through the local ODF office, or a non-activity "406" number obtained through the Salem headquarters office.
2. Units to be burned shall be planned through OSMD 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 by the day of the burning.
3. Burning results for all federal burning shall be reported in the OSMD the first business day following the burn.
4. 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 discouraged unless approved by the Smoke Management unit manager.

## OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

### OREGON SMOKE REGISTRATION PART 1:

<b>UNIT IDENTIFICATION:</b>	Unit 1:	Unit 2:	Unit 3:	Unit 4:	Unit 5:
DATE REGISTERED:					
REGISTRATION #:					
DISTRICT ID:					
OWNERSHIP CODE:					
SALE NAME:					

<b>UNIT INFORMATION:</b>	Unit 1:	Unit 2:	Unit 3:	Unit 4:	Unit 5:
TOWNSHIP:					
RANGE:					
SECTION:					
LATITUDE:					
LONGITUDE:					
COUNTY:					
DISTANCE TO SSRA:					
UNIT ACRES:					
CUTTING DATE:					
ELEVATION:					
SLOPE:					
BURN TYPE:					
BURN REASON:					

<b>TREATMENT SUMMARY:</b>	Unit 1:	Unit 2:	Unit 3:	Unit 4:	Unit 5:
OPERATOR NAME:					
FUEL SPECIEIS:					
LANDING R/W ACRES:					
LANDING R/W TONS:					
PILE ACRES:					
PILE TONS:					
BROADCAST ACRES:					
DUFF DEPTH:					

<b>FUEL TONS PER ACRE (SOUND):</b>	Unit 1:	Unit 2:	Unit 3:	Unit 4:	Unit 5:
0 - 1/4"					
1/4 - 1"					
1 - 3"					
3 - 9"					
9 - 20"					
20+ "					

LITTER TYPE:					
LITTER DEPTH:					
LITTER % COVERAGE:					

<b>FUEL TONS PER ACRE (ROTTEN):</b>	Unit 1:	Unit 2:	Unit 3:	Unit 4:	Unit 5:
3 - 9"					
9 - 20"					
20+ "					

<b>ROTTON STUMPS:</b>	Unit 1:	Unit 2:	Unit 3:	Unit 4:	Unit 5:
DIAMETER:					
HEIGHT:					
DENSITY:					

<b>LIVE FUELS:</b>	Unit 1:	Unit 2:	Unit 3:	Unit 4:	Unit 5:
SHRUB TYPE:					
SHRUB % COVERED:					
SHRUB HEIGHT:					
TONS PER ACRE:					

**COMMENTS:**

<b>BILLING INFORMATION:</b>	Unit 1:	Unit 2:	Unit 3:	Unit 4:	Unit 5:
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**

***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

### Smoke Management Registration (Part 1 of 3)



Fee payer Name:		<input type="checkbox"/> Operator		<input type="checkbox"/> 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: <input type="checkbox"/> Private (P) <input type="checkbox"/> Fed-Not FS (O) <input type="checkbox"/> R6 Fed (F) <input type="checkbox"/> USFS (U) <input type="checkbox"/> State, County, City (S)						
Sale/Unit Name:						
Legal Location: TWN	N S	R N G	E W	S E C	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)	<input type="checkbox"/> (B) Broadcast Activity	<input type="checkbox"/> (G) Grapple Pile	<input type="checkbox"/> (U) Underburn Activity	<input type="checkbox"/> (L) Landing Piles Only <sup>a</sup>	<input type="checkbox"/> (R) R/W	
	<input type="checkbox"/> (F) Broadcast Natural	<input type="checkbox"/> (H) Hand Pile	<input type="checkbox"/> (N) Underburn Natural	<input type="checkbox"/> (T) Tractor Pile	<input type="checkbox"/> (S) Range	
<i><sup>a</sup>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.</i>						
Burn Reason: (Check only 1)	<input type="checkbox"/> (H) Hazard Reduction	<input type="checkbox"/> (W) Wildlife Habitat	<input type="checkbox"/> (F) Forest Health	<input type="checkbox"/> (M) Forest Health Maint.		
	<input type="checkbox"/> (B) Hazard & Silviculture	<input type="checkbox"/> (S) Silviculture	<input type="checkbox"/> (R) Other	<input type="checkbox"/> (E) Lvl. 2 Reg., Fee Exempt		
Species: Only 1	<input type="checkbox"/> (D) Douglas Fir/Hemlock/Cedar		<input type="checkbox"/> (H) Hardwood	<input type="checkbox"/> (M) Mixed Conifer	<input type="checkbox"/> (B) Brush	
	<input type="checkbox"/> (S) Sage/Bitterbrush		<input type="checkbox"/> (G) Grass	<input type="checkbox"/> (P) Ponderosa	<input type="checkbox"/> (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"+)		
<b>Forest Floor Litter Type:</b>						
<input type="checkbox"/> Short Needle Pine	<input type="checkbox"/> Long Needle Pine	<input type="checkbox"/> Other Conifer	<input type="checkbox"/> Deciduous Hardwood	<input type="checkbox"/> Evergreen Hardwood	<input type="checkbox"/> Grass	
Litter Depth (i.e. 1.3")			Litter coverage on ground (%)			
Rotten Stumps: (Average Diameter, Height, and amount per acre.)						
Rotten Logs: (Tons)	3-9"	9-20"	20+"			
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 preferred.)						



**OPERATIONAL GUIDANCE FOR THE OREGON  
SMOKE MANAGEMENT PROGRAM**

**Smoke Management Registration  
Accomplishment Section, (Registration Part 3)**



<b>Operator Name:</b>		<b>Phone:</b>	
_____		_____	
<b>Unit Name:</b>		<b>Registration #:</b>	
_____		_____	
<b>Actual Burn Date:</b>		<b>Actual Ignition Time:</b>	
_____		_____	
<b>Actual Acres Burned:</b>		<b>Landing-R/W Tons Burned:</b>	
_____		_____	
<b>File Tons Burned:</b>		<b>Broadcast Tons/Ac. Burned:</b>	
_____		_____	
<b>Total Broadcast Tons Burned:</b>		<b>Total Tons Burned:</b>	
_____		_____	
<b>Ignition Duration:</b>	<b>Achieved Rapid Consumption:</b>	<b>Shrub Consumption:</b>	
_____	_____	_____	
<b>Duff Fuel Moisture:</b>	<b>Fuel Moisture 10Hr%</b>	<b>1000Hr%</b>	
_____	_____	_____	
<b>Fuel Moisture Code:</b>	<input type="radio"/> NFDR-th (1000hr moisture from NFDRS model)		
	<input type="radio"/> Adj-th (user adjusted moistures)		
	<input type="radio"/> Weighted (oven weighted samples)		
_____		_____	
<b>Days Since Significant Rain:</b>		<b>Wind Speed:</b>	
_____		_____	
<b>Additional Comments:</b>			
_____			
_____			
_____			

## INSTRUCTIONS FOR REPORTING SYSTEM CODING SHEET

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 ONE: REGISTRATION INFORMATION**

1. **Date registered:** Enter the day of registration in MM/DD/YY format.
2. **Registration number:** Twelve digits, the ten (10) digit E-notification number obtained through the Forest Practices program plus a two-digit unit extension that can come from either the 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 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.
3. **District or Forest Identifier:** A three-digit code as shown in the table, "Smoke Management District ID Numbers" later in this Appendix.
4. **Ownership type:**

USFS - U	Federal (BLM) - F
Other Federal – O	State, County, Municipal – S
Private - P	
5. **Sale name:** Up to 20 characters, letters, and numbers only with no punctuation.
- 6-8. **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 ".25, .5, or .75", respectively after the full township or range. If the unit covers more than one section, enter the predominant section number.
  6. Township
  7. Range
  8. Section

**INSTRUCTIONS FOR  
REPORTING SYSTEM CODING SHEET**

**PART 1: BASIC UNIT INFORMATION** (Cont.)

Examples:

	Field Number		
	<u>10</u>	<u>11</u>	<u>12</u>
T10S-R10W-S33	10S	10W	33
T10 1/2S-R11E-S25	10.5S	11E	25
T9 3/4S-R7 1/2E-S6	9.7S	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 RECORDING SYSTEM CODING SHEET

### **PART 1: BASIC UNIT INFORMATION** (Cont.)

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 21 through 26, below.
14. **Date when 70% of the cutting was completed:** Enter the six-digit code "yyyy-mm", e.g. "2009-12" means that December 2009 was the cutting date. Leave blank for natural fuels or no cutting.
15. **Elevation of burn:** Elevation of burn above sea level in feet. Enter average elevation to the nearest 100 feet.
16. **Slope:** Enter actual average slope. Maximum of three digits, do not enter % symbol.  
Example: 30% slope is entered as "30".
17. **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).
20. **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    |                    |

## INSTRUCTIONS FOR REPORTING SYSTEM CODING SHEET

### PART 1: BASIC UNIT INFORMATION (Cont.)

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.
22. **Landing and right-of-way pile acres:** Enter the total 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 28-33). Leave blank if there are none.
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.
24. **Piled acres:** Enter the number of acres expected to be burned as in unit piles. Leave blank if there are none.
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 expected to be burned in the unit. 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".
- 28-33. **Woody loading in broadcast and underburns:** Reported as tons per acre by size class. For natural fuels burns, include all fuel types in the appropriate size classes. Round all data to the nearest ton/acre.
  28. 0 - 0.25" loading
  29. 0.26 - 1.00" loading
  30. 1.1 - 3.00" loading
  31. 3.1 - 9.00" loading
  32. 9.1 - 20.00" loading
  33. >20" loading

## INSTRUCTIONS FOR REPORTING SYTEM CODING SHEET

### 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 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. **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:**
  6. **Landing pile tons:** For right-of-way and landing pile units, enter the total tons expected to be burned. 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 expected to be burned. 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 ground fuel expected to be burned in tons per acre.

## INSTRUCTIONS FOR 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 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. **Landing or right-of-way tons burned:** (may be more or less than that entered in Part 1 and 2): Enter the total tons of material actually burned in the piles.
7. **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. **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 REPORTING 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 ground fuel burned as tons per acre. This number can be more or less than the entries made in Part 1 and Part 2.
10. **Was rapid ignition achieved?**  

Enter "Y" or "N", use subjective judgment to answer.
11. **Shrub consumption (optional entry):** Percentage of shrubs consumed in unit.
12. **Duff fuel moisture:** Enter either dry (30%), normal (70%), or moist (120%).
13. **10-hour fuel moisture:** Enter the percentage rounded to whole numbers. Example: 15.4% fuel moisture should be entered as "15".
14. **1000-hour fuel moisture:** Enter the percentage without the "%". Example: 24% fuel moisture should be entered as "24".
15. **1000-hr fuel moisture code:** Method used to determine. Enter one of the selections below for the method used to determine 1000-hr moisture.  

Method  
NFDR-th  
Adj-th  
Weighed
16. **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.
17. **Wind speed:** In miles per hour

### SMOKE MANAGEMENT DISTRICT ID NUMBERS

District/Forest	Unit	ID	District/Forest	Unit	ID	District/Forest	Unit	ID
Astoria		521	National Park Svc		09x	Walker Range		991
Central Oregon		95x		Crater Lake	090	Wallowa-Whitman N.F.		16x
	Fossil	953		Oregon Caves	091			
	John Day	952	North Cascade		58x	Eagle Cap		165
	Monument	956		Molalla	581	Hell Canyon NRA		164
	Prineville	951		Santiam (Linn)	583	La Grande		166
	Sisters	955		Santiam (Marion)	582			
	The Dalles	954	Northeast Oregon		97x			
Columbia Gorge Scenic Area		220		Baker	972	Wallowa Valley		162
Coos District		740		La Grande	971	Whitman		163
Coos FPA		72x		Pendleton	973	West Oregon		55x
	Bridge	722		Wallowa	974			
	Coos Bay	721	Ochoco N.F.		07x	Dallas		552
	Gold Beach	723		Crooked River National Grassland	075	Philomath		551
Deschutes N.F.		01x		Lookout Mountain	071	Toledo		553
	Bend/Fort Rock	011		Paulina	072	Western Lane		781
	Crescent	012	Rogue-Siskiyou N.F.		10x	Willamette N.F.		18x
	Sisters	015		Gold Beach	103			
Douglas FPA		73x		Wild Rivers	102			
	Central Douglas	733		Siskiyou Mountains	101			
	North Douglas	731		High Cascade	106	Winema N.F.		20x
	South Douglas	732		Powers	105			
Forest Grove		53x	Siuslaw N.F.		12x	Chemult		201
	Columbia City	532		Central Coast	128	Chiloquin		202
	Forest Grove	531		Hebo	121	Klamath		203
Fremont N.F.		02x		Oregon Dunes	124			
	Bly	021	South Cascade		77x			
	Lakeview	022		Eastern Lane	771			
	Paisley	023		Sweet Home	772			
	Silver Lake	024	Southwest Oregon		71x			
Klamath N.F.		301		Central Point	711			
Klamath-Lake		98x		Grants Pass	712			
	Klamath Falls	981	Tillamook		511			
	Lakeview	982	Umatilla N.F.		14x			
Malheur N.F.		04x		Heppner	142			
	Blue Mountain	041		North Fork John Day	145			
	Emigrant Creek	042		Walla Walla	146			
	Prairie City	044	Umpqua N.F.		15x			
Mt Hood N.F.		06x		Cottage Grove	151			
	Barlow	061		Diamond Lake	153			
	Clackamas	065		North Umpqua	156			
	Hood River	066		Tiller	152			
	Zig Zag	069						



## REPORTING SMOKE INTRUSIONS AND SMOKE INCIDENTS

- A. Smoke intrusion reports and the smoke incident log provide a descriptive record of smoke impacts into SSRAs or other sensitive areas. Smoke intrusion reports shall be made for 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 minimize future smoke impacts. The incident 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, and national forests) are responsible for monitoring smoke from burning activity and reporting smoke impacts to the Smoke Management Meteorologist. 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.
- C. The Salem Smoke Management unit completes sections A through 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 a smoke intrusion 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. Transmit to applicable field offices and DEQ initial notification of smoke intrusions as soon as they become aware of smoke entering at PM levels at or above the one-hour or 24-hour thresholds.
  2. Coordinate with other offices and agencies to develop descriptive reports of smoke 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

- D. 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 in C. When the intrusion report is complete and disseminated, ODF, DEQ and members of the agency 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 impacts into SSRAs, Class I Areas, or areas sensitive to smoke by telephone to the Smoke Management forecaster as soon as possible. If Smoke Management office is not open leave a message with a return number.

Personnel observing smoke entering an SSRA from burn units outside 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) that smoke is entering or about to enter an SSRA.

2. An evaluation of the impact shall be made by field personnel, time and workload permitting, to determine the extent, magnitude, and duration of the smoke impact.

**SMOKE INTRUSION REPORT  
Form 1-4-1-301**

**SMOKE 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 (ft.)	Acres	Tons	Burn Date	Start Time	End Time

**B. INTRUSION SUMMARY:**

1. Area Affected \_\_\_\_\_
2. Intrusion Date \_\_\_\_\_ Start Time \_\_\_\_\_ End Time \_\_\_\_\_ Duration \_\_\_\_\_ hour(s)
3. Highest hourly PM<sub>2.5</sub> (µg/m<sup>3</sup>) \_\_\_\_\_ or lowest prevailing visibility during intrusion (mi) \_\_\_\_\_
4. 24-hr average PM<sub>2.5</sub> (µg/m<sup>3</sup>) (midnight to midnight) \_\_\_\_\_

**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



## **SMOKE MAGNITUDE DETERMINATION FROM VISIBILITY OBSERVATIONS**

INTRODUCTION: When no PM monitor data is available to determine the magnitude of a smoke 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 PM monitor data. Use the procedure outlined below to determine prevailing visibility and the visibility table in Appendix 2, page 6 to make an estimate of the magnitude of a smoke impact.

### OBSERVATION PROCEDURE:

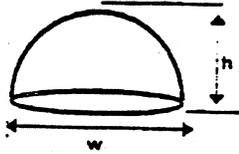
1. Determination of sector visibility: When the visibility is not uniform in all directions, divide the horizon circle into sectors which have approximately the same visibility. Using available landmarks, aided by a detailed local area map, determine the greatest distances that can be seen in each segment 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) 5 <u>2½*</u> 2¼ 2	Approximate Degrees 90 <u>90</u> 90 90	
Visibility (Miles) 10 <u>8*</u> 6 5	Approximate Degrees 40 <u>150</u> 70 100	
Visibility (Miles) 8 6 <u>5*</u> 4	Approximate Degrees 100 50 <u>130</u> 80	

<b>OREGON SMOKE MANAGEMENT SMOKE COMPLAINT REPORT</b>		
<b>Complaint From:</b>	Name:	Organization:
	Address:	Phone:
<b>Received by:</b>	Name:	Office:
	Date:	Time:
<b>Complaint Source:</b>	<input type="checkbox"/> Phone:	<input type="checkbox"/> Mail
	<input type="checkbox"/> In Person	<input type="checkbox"/> Email:
	<input type="checkbox"/> Other:	
<b>Investigated By:</b>	Name:	Office:
	Date:	Time:
<b>Location of Smoke Impact:</b>		
<b>Location of Smoke Source:</b>	T                  R                  sec	Unit Number(s):
<b>Description of Complaint:</b>		
<input type="checkbox"/>	Inform the complainant that they have ability to receive follow-up.	
<b>Investigation Results:</b>	<input type="checkbox"/> Burn Permit Issued	Landowner
	Reported Tons/Acres	Actual Tons/Acres
	<input type="checkbox"/> In data system	Citation issued
	<input type="checkbox"/> Instruction Compliance	<input type="checkbox"/> Referred to other Agency
	<input type="checkbox"/> Other	
Remarks:		
<b>Distribution:</b>	<input type="checkbox"/> Smoke Management	USFS: R6 <input type="checkbox"/> District <input type="checkbox"/>
	<input type="checkbox"/> District	BLM: State Office <input type="checkbox"/> District <input type="checkbox"/>
	<input type="checkbox"/> Area	Tribe/Other Agency <input type="checkbox"/>
Complaint No.	Signature	Date

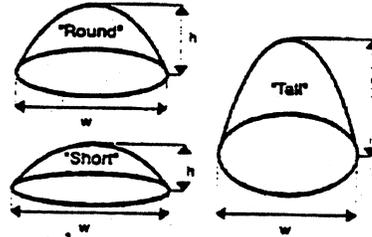
SHAPE CODE CHARTS

1. Half-section of Sphere



Half of a ball, where the width is approximately twice the height, and the sides are evenly rounded.

2. Paraboloids

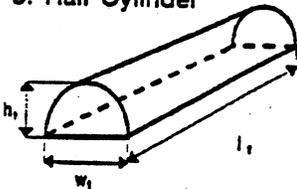


Pile height is same as radius (half diameter), but surface tapers in a parabola towards the top.

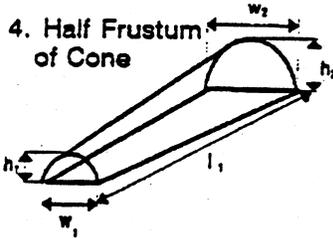
Sides taper in a parabola towards the top, where the height is greater than the radius (half the width).

Pile height is less than half the radius, and the sides drop down to the base in a parabola.

3. Half Cylinder



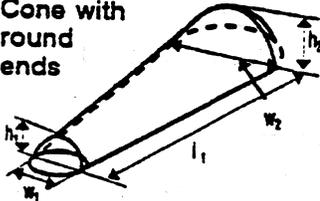
Logs and debris are generally aligned in parallel. Pile shape is rounded side-to-side, with both ends of the pile approximately the same height.



4. Half Frustum of Cone

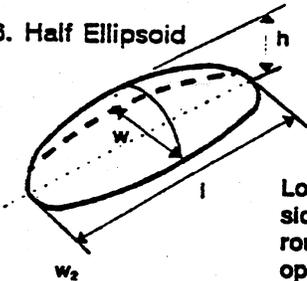
Logs and debris are generally aligned in parallel. Pile shape is rounded side-to-side, but heights of opposing ends are not equal (pile tapers).

5. Half Frustum of Cone with round ends



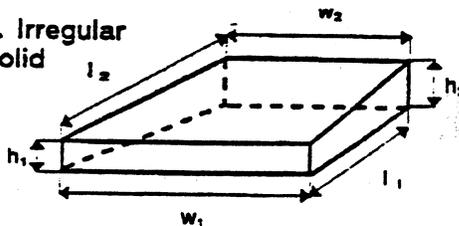
Pile shape is generally the same as #4, but the ends are rounded, and appearance is similar to half a pear.

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 website) may be used to record observations during aerial monitoring flights. 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.

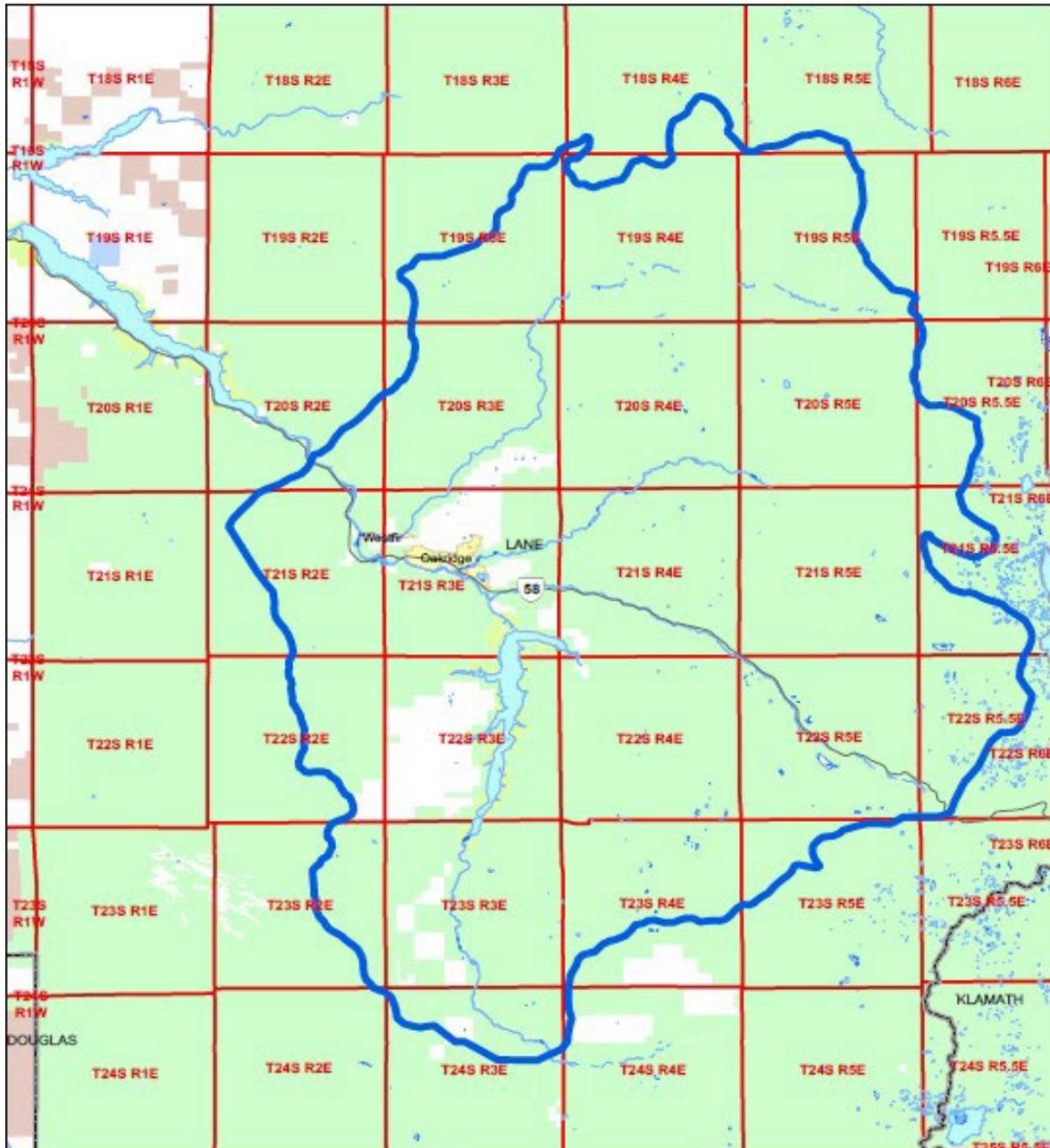
The chart on the second page of the form may be used during takeoff and/or landing to record a temperature profile using the aircraft outside air temperature sensor. These profiles are an aid to help determine atmospheric stability and mixing height.



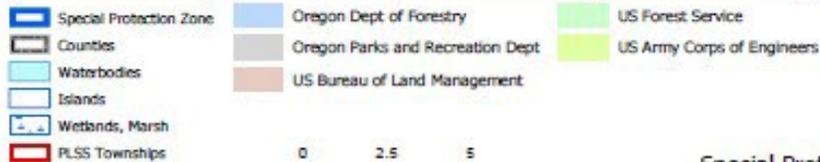


### SPECIAL PROTECTION ZONE MAPS

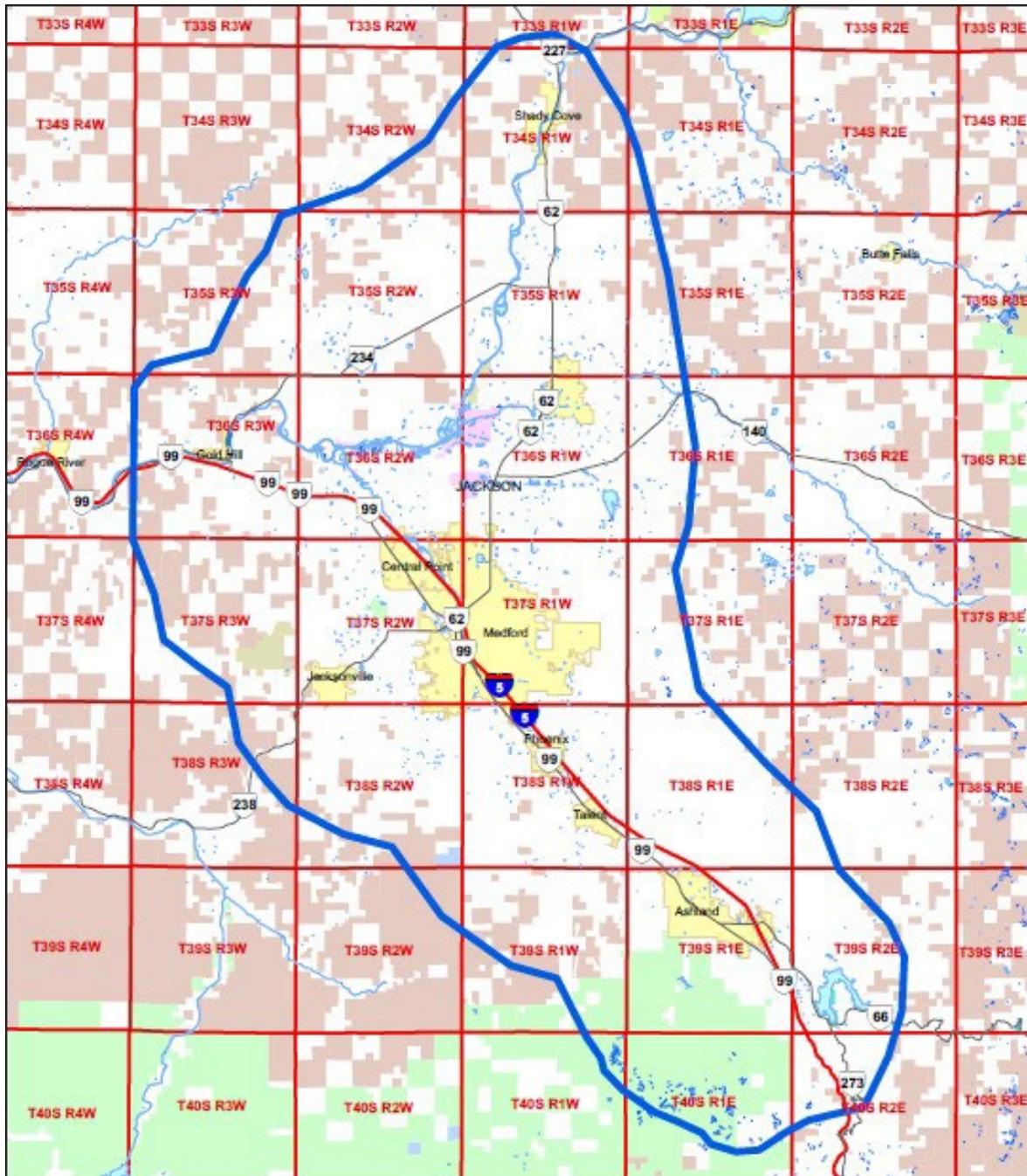
Special Protection Zone (SPZ) boundaries are shown in maps in this appendix. SPZ rules are found in OAR 629-048-0135 and 0137.



ODF GIS February 7, 2019

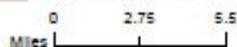


Oakridge  
Special Protection Zone

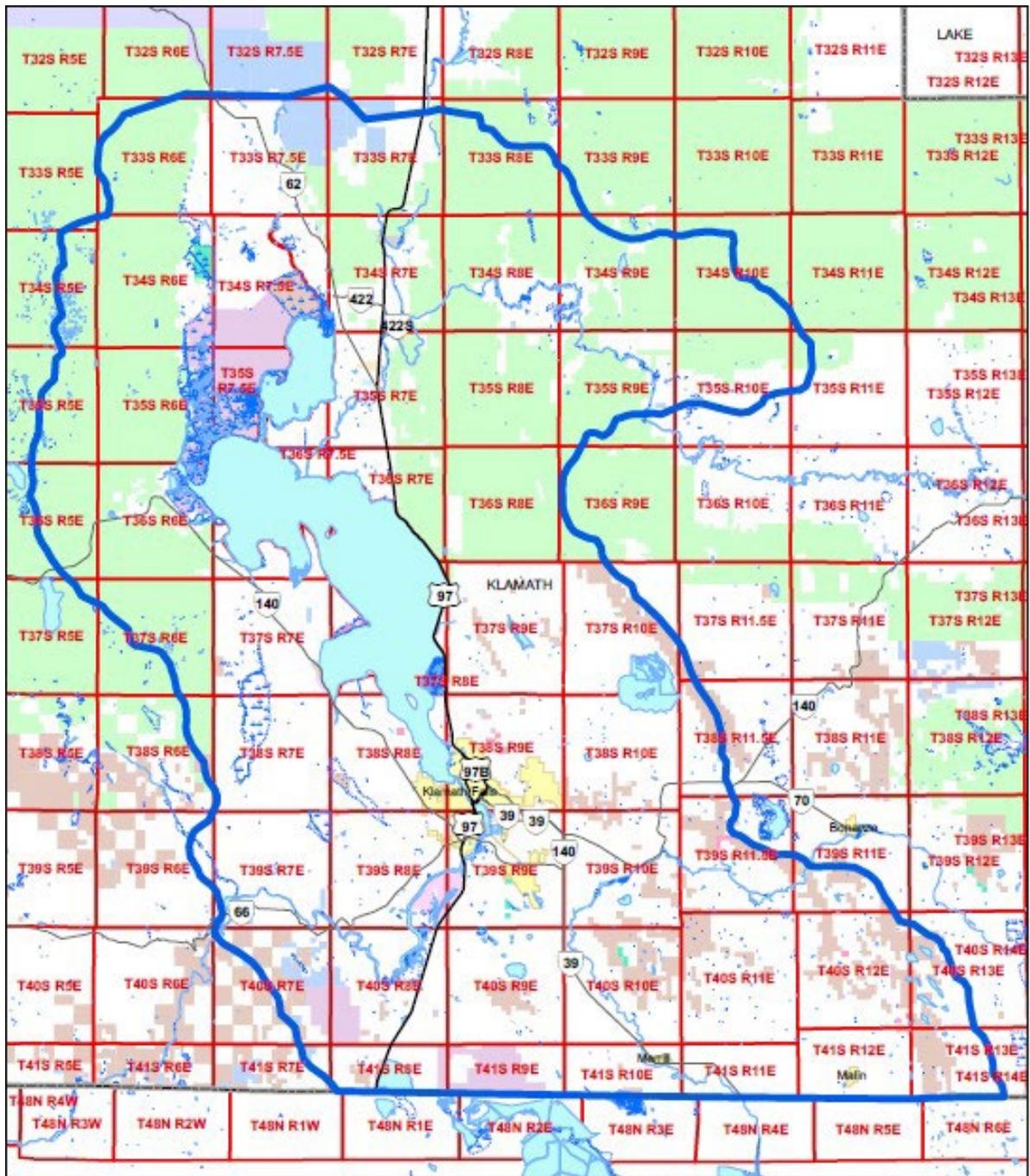


ODF GIS February 7, 2019

- |                         |                                   |                            |
|-------------------------|-----------------------------------|----------------------------|
| Special Protection Zone | Oregon Dept. of Forestry          | US Forest Service          |
| Counties                | Oregon Dept. of Fish and Wildlife | US Army Corps of Engineers |
| Waterbodies             | Oregon Dept. of Transportation    | Other Federal Lands        |
| Islands                 | Oregon Parks and Recreation Dept. | Local Government           |
| Wetlands, Marsh         | US Bureau of Land Management      |                            |
| PLSS Townships          |                                   |                            |



Medford  
Special Protection Zone

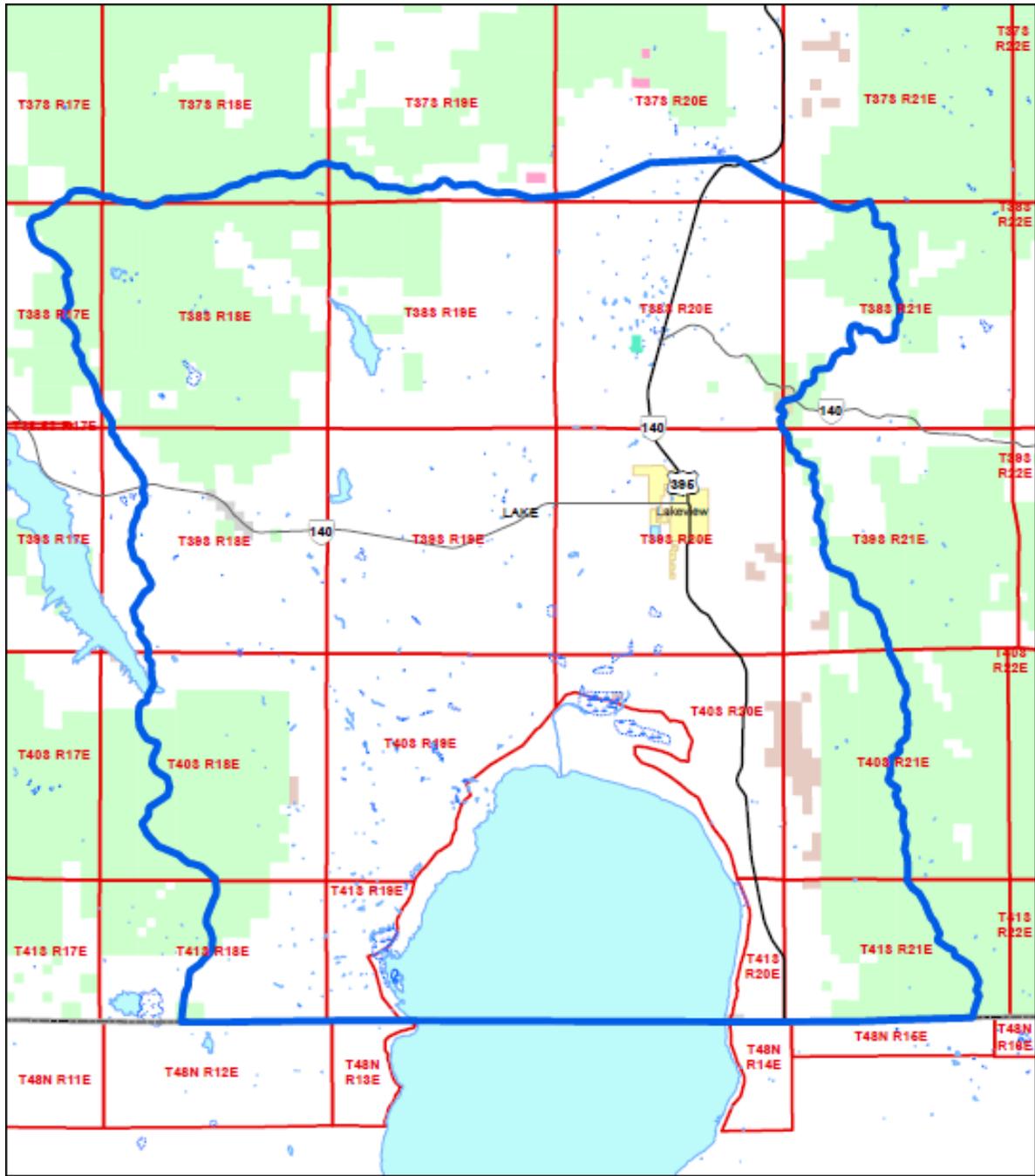


ODF GIS February 7, 2019

- |                         |                                  |                              |                             |
|-------------------------|----------------------------------|------------------------------|-----------------------------|
| Special Protection Zone | Oregon Dept of Forestry          | Other State of Oregon Lands  | Other Federal Lands         |
| Counties                | Oregon Dept of Fish and Wildlife | US National Park Service     | US Bureau of Indian Affairs |
| Waterbodies             | Oregon Dept of State Lands       | US Bureau of Land Management | Tribal Trust or Fee Lands   |
| Intermittent Lakes      | Oregon Dept of Transportation    | US Forest Service            | Local Government            |
| Islands                 | Oregon Parks and Recreation Dept | US Fish and Wildlife Service |                             |
| Wetlands, Marsh         |                                  |                              |                             |
| PLSS Townships          |                                  |                              |                             |

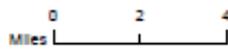


Klamath  
Special Protection Zone



ODF GIS February 7, 2019

- |                         |                                  |                     |
|-------------------------|----------------------------------|---------------------|
| Special Protection Zone | Oregon Dept of State Lands       | US Forest Service   |
| Counties                | Oregon Parks and Recreation Dept | Other Federal Lands |
| Waterbodies             | US Bureau of Land Management     | Local Government    |
| Intermittent Lakes      |                                  |                     |
| Islands                 |                                  |                     |
| Wetlands, Marsh         |                                  |                     |
| PLSS Townships          |                                  |                     |



Lakeview  
Special Protection Zone