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 smoke 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;

B. Coordinate with other state smoke management programs;

C. Comply with state and federal air quality and visibility requirements;

D. Protect public health; and

E. Promote the reduction of emissions by encouraging cost effective utilization of forestland biomass, alternatives to burning, and alternative burning practices.

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 Forster 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 keep smoke out of 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 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 March through June and mid September through November, 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_Information). 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.

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

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other restrictions as may be necessary to prevent 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.

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. 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 smoke from being carried into SSRAs.

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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 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 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 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. 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

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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. 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. 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.

I. Smoke Impacts: There are two types of smoke impacts: intrusions of smoke into SSRAs and smoke incidents where significant smoke enters a Class I Area or other sensitive/populated areas. For two Class I Areas, extra effort (use of test fires or balloon

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releases to check wind direction or coordinating with the duty forecaster) is needed to keep 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 intrusion or smoke incident, the District Forester shall assign a qualified individual to conduct an investigation and document the findings.

1. Intrusions (OAR 629-048-0110): An intrusion occurs when smoke from prescribed burning enters an SSRA at ground level, as defined in OAR 629-048-0005 (18). For every occurrence the source of the impact, duration, and intensity of an intrusion will be determined if possible. Intensity shall be determined using nephelometer readings when available, or estimated from the reduction of visibility in the intrusion area.

    a. When nephelometer readings are available, intrusions will be characterized based on the rise of the nephelometer reading above the background level prior to the intrusion. 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:

Light:	less than 1.8×10^{-4} B-scat above background
Moderate:	1.8×10^{-4} B-scat to 4.9×10^{-4} B-scat above background
Heavy:	greater than 4.9×10^{-4} B-scat above background

    b. Visibility: If no nephelometer data is available, or if smoke impacting a community is not observed by a nephelometer, the intensity of the impact may be estimated from reduction of the prevailing visibility. Intensity of an intrusion based on visibility estimates shall be characterized as follows:

INTRUSION CLASSIFICATION BASED ON VISIBILITY REDUCTION (RV)

(See next page)

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(For instructions on estimation of visibility see Appendix 2)

Background Visibility (Miles)*	INTRUSION INTENSITY**		
	LIGHT	**MODERATE**	**HEAVY**
>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 is based on the average visibility in the three hours prior to the onset of the intrusion. Visibility changes due to naturally occurring phenomena must be factored into the classification as needed (e.g., the change from daylight to dark, onset of a rain shower, etc.)

**Intrusion intensity will be adjusted as necessary based on observation of other particulates in the area of the prescribed burning impact.

2. Intrusion Reporting:

   a. Preliminary reports shall be issued by the Smoke Management forecasters when they become aware that smoke is entering, or is about to enter, an SSRA. 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.

   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 Forester within two working days and submitted to the Smoke Management forecaster. The forecaster completes the second portion of the analysis of the event and distributes the report to interested agencies. A report format is provided in Appendix 2.

3. 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.

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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.

J. 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:

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 is ongoing when the complaint is received, reasonable effort should be made to dispatch the nearest qualified department

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personnel to the location in question to observe and document the intensity, duration, scope, and origin of the incident.

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:

      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

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Management Advisory Committee when requested.

K. 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, severity, 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.

   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.

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:

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a. Determining total pre-burn fuel tonnage load.

b. Determining average pre-burn duff depth.

c. Computing woody fuel consumption using available tools developed to predict woody fuel consumption.

d. Calculating and adding duff consumption.

2. Estimation of the total pre-burn fuel tonnage should be through the application of the "planar transect method" of inventorying forest residue, 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.

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. Statistical sample of pile volume. 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) or through manual calculations.

c. Aerial photo interpretation may be used when large-scale aerial photographs of slash piles in harvested units can be evaluated to determine

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dimensions and volumes. References for application of this technique may be obtained via the Internet or the Pacific Northwest Research Station, USFS.

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 USFS Consume application or the ODF Automatic Calculation of Slash Tonnage (ACOST) and PCOST spreadsheets may be used to estimate fuels consumed during the prescribed burn. 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 September through November). 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.

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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, and state forest protection districts.

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 at Appendix 1, page 8**.** In areas subject to Level 1 regulation, all planned and accomplished burning is entered into the computer on a daily basis. Planned burns shall be entered by the day of the burn and accomplishments are reported on the next working 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 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 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 at the local ODF field office. The ODF Forest Practices Forest Activities Computer Tracking System (FACTS) 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 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 data system developed for use by the agencies. The primary unit identifier shall be the FACTS number, obtained through the local ODF 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 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 system 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 system the 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 allowed unless approved by the Smoke Management unit manager.

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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
	xxxxxxxxxxx	xxx	xxxxxxxxxxxxxxxxxx	x	xxx	xxxxxxxxxxxxxxxxxx	xxx	xxxx	xxxx	xx	xx	xx	x

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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 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

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	

INSTRUCTIONS FOR
DATA FORM 1-4-1-501 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 1: BASIC UNIT INFORMATION

1. **Unit Number:** Twelve digits, the ten (10) digit FACTS number obtained through the Forest Practices program plus a two (2) digit unit extension that can come from either the FACTS 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 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.

2. **District or Forest Identifier:** A three-digit code as shown in the table on page 17 of Appendix 1.

3. **Owner name (optional entry):** Up to 20 characters, letters, and numbers only with no punctuation.

4. **Ownership type:**

USFS - blank	Federal (except USFS) - F
State, County, Municipal - S	Private - P

5. **FPF number (Optional entry):** Up to three characters

6. **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

PART 1: BASIC UNIT INFORMATION (Cont.)

8-10. **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 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. Township

9. Range

10. Section

Examples:

	Field Number		
	10	11	12
T10S-R10W-S33	100S	100W	33
T10 1/2S-R11E-S25	105S	110E	25
T9 3/4S-R7 1/2E-S6	097S	075E	6

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

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. **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 and 25, below.

15. **Date when 70% of the cutting was completed:** Enter the four-digit code "mmyy", e.g. "1209" means that December 2009 was the cutting date. Enter "9999" 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. **Elevation of burn:** Elevation of burn above sea level in feet. Enter average elevation to the nearest 100 feet.

18. **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 MANAGEMENT

PART 1: BASIC UNIT INFORMATION (Cont.)

20. **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

21. **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. **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

PART 1: BASIC UNIT INFORMATION (Cont.)

24. **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 (See item 26-30). Duff loading should not be reported here. Note: Landing/right-of-way and in-unit piles must be registered separately to facilitate fee assessment.

25. **Other acres:** Enter the number of acres to be burned as broadcast, unit piles, underburn, or other non-landing/right-of-way type of burning.

26. **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, in the unit. Enter "0" if there are none.

27-32. **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. 0 - 0.25" loading
28. 0.26 - 1.00" loading
29. 1.1 - 3.00" loading
30. 3.1 - 9.00" loading
31. 9.1 - 20.00" loading
32. >20" loading

33. **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	

INSTRUCTIONS FOR
DATA FORM 1-4-1-501 FOR SMOKE MANAGEMENT

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:** 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" 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 to be burned. Enter "0" 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 to be burned in tons per acre.

INSTRUCTIONS FOR
DATA FORM 1-4-1-501 FOR SMOKE MANAGEMENT

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 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 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 or right-of-way piles:** (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 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 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 MANAGEMENT

PART 3: ACCOMPLISHED BURN (Cont.)

9. **Fuel consumed in broadcast and underburn portion of units:** Enter the amount of woody fuel and duff 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".

12. **Was rapid ignition achieved?**

    Enter "Y" or "N", use subjective judgment to answer.

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.

14. **10-hour fuel moisture:** Enter the percentage, rounded to whole numbers. Example: 15.4% fuel moisture should be entered as "15".

15. **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 MANAGEMENT

PART 3: ACCOMPLISHED BURN (Cont.)

16. **1000-hr fuel moisture:** Method used to determine. Enter a single character for the method used to determine 1000-hr moisture.

Method	Entry Code
NFDR-th	"N"
Adj-th	"A"
Weighed	"W"

17. **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").

    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 Nf		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

District/Forest	Unit	ID
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	075
	Lookout Mountain	071
	Paulina	072
Rogue-Siskiyou N.F.		10x
	Chetco/Gold Beach	103
	Galice/Illinois Valley	102
	Applegate/Ashland	101
	Butte Falls	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

District/Forest	Unit	ID
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
1	2	3	4
xxxxxxxxxxxx	mm/dd/yy	xxxx	xxxxx

INSTRUCTIONS

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.

REPORTING SMOKE INCIDENTS

A. Intrusion/incident reports provide a descriptive record of smoke impacts into populated or other sensitive areas. Intrusion reports shall be made for any prescribed burning smoke that enters SSRAs. Smoke entering 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 future smoke impacts. Incident reports 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 or national forests, are responsible for monitoring smoke from burning activity and reporting intrusions to the Smoke Management Meteorologist through the use of Form 1-4-1-301. 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 through M of the report. In the event that an 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.

2. Coordinate with other offices and agencies to develop descriptive reports of smoke incidents and intrusions.

3. Prepare an annual summary of intrusions and 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.

Procedures:

1. Burn bosses, field administrators, or other forestry personnel shall report suspected smoke incidents 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 after the incident.

REPORTING SMOKE INCIDENTS

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 shall be made by field personnel, time and workload permitting, to determine the extent, intensity, 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 INTENSITY DETERMINATION
FROM VISIBILITY OBSERVATIONS**

INTRODUCTION: When no nephelometer data is available to determine the intensity of a smoke incident, 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 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 data. Use the procedure outlined below to determine prevailing visibility and the visibility table at Appendix 2, page 7 of the Smoke Management Directive 1-4-1-601 to make an estimate of the intensity of a smoke impact.

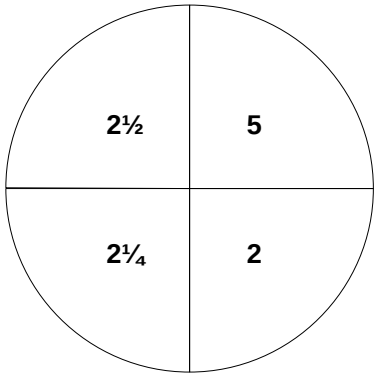
OBSERVATION PROCEDURE:

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.

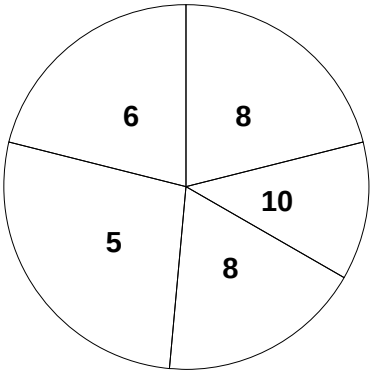
2. Determination of prevailing visibility: After sector visibilities have been determined, resolve them into a single value for reporting purposes. To do this, use either the greatest distance that can be seen throughout at least half the horizon circle, or if the visibility is varying rapidly during 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)

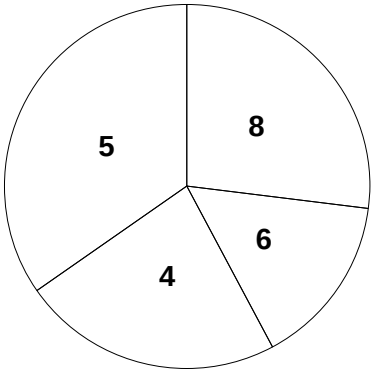
Visibility (Miles)	Approximate Degrees
5	90
2½ *	90
2¼	90
2	90



Visibility (Miles)	Approximate Degrees
10	40
8*	150
6	70
5	100



Visibility (Miles)	Approximate Degrees
8	100
6	50
5*	130
4	80

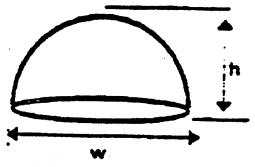


OREGON SMOKE MANAGEMENT
SMOKE COMPLAINT REPORT

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

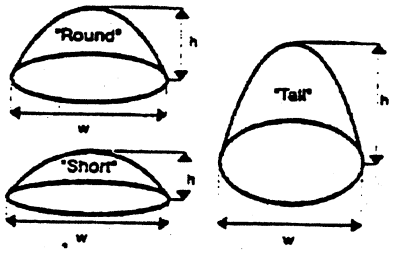
SHAPE CODE CHARTS

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

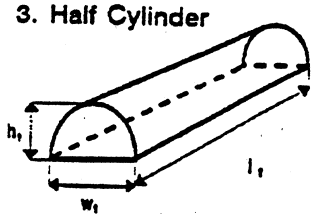


Pile height is same as radius (half diameter), but surface tapers in a parabola towards the top.

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

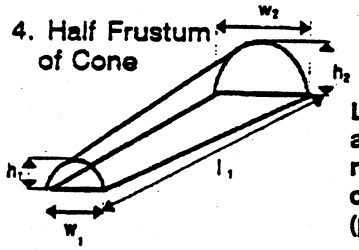
Pile height is less than half the radius, and the sides drop down to the base in a parabola.

3. Half Cylinder



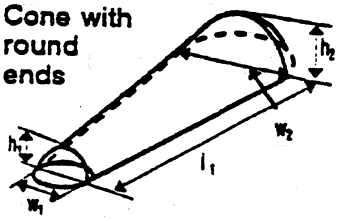
Logs and debris are generally aligned in parallel. Pile shape is rounded side-to-side, with both ends of the pile approximately the same height.

4. Half Frustum of Cone



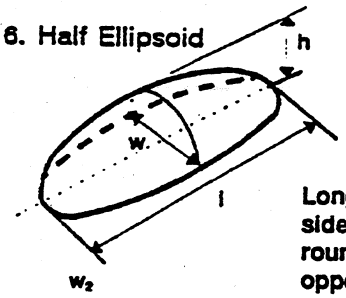
Logs and debris are generally aligned in parallel. Pile shape is rounded side-to-side, but heights of opposing ends are not equal (pile tapers).

5. Half Frustum of Cone with round ends



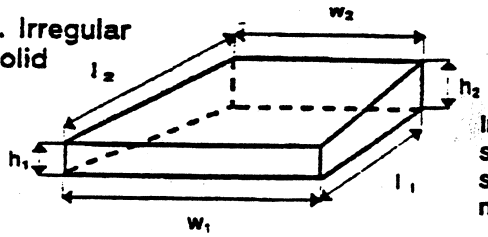
Pile shape is generally the same as #4, but the ends are rounded, and appearance is similar to half a pear.

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) 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 Top	Smoke Movement Low-level 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.

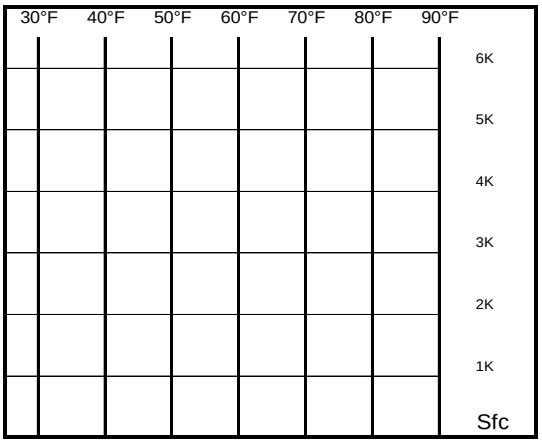
5. No column development. Smoke diffuses with little or no lift. Most smoke near surface with little tendency to hold together. Smoke spreads.

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

Special Protection Zone (SPZ) boundaries are shown in the maps in this appendix.

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:

1. 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:

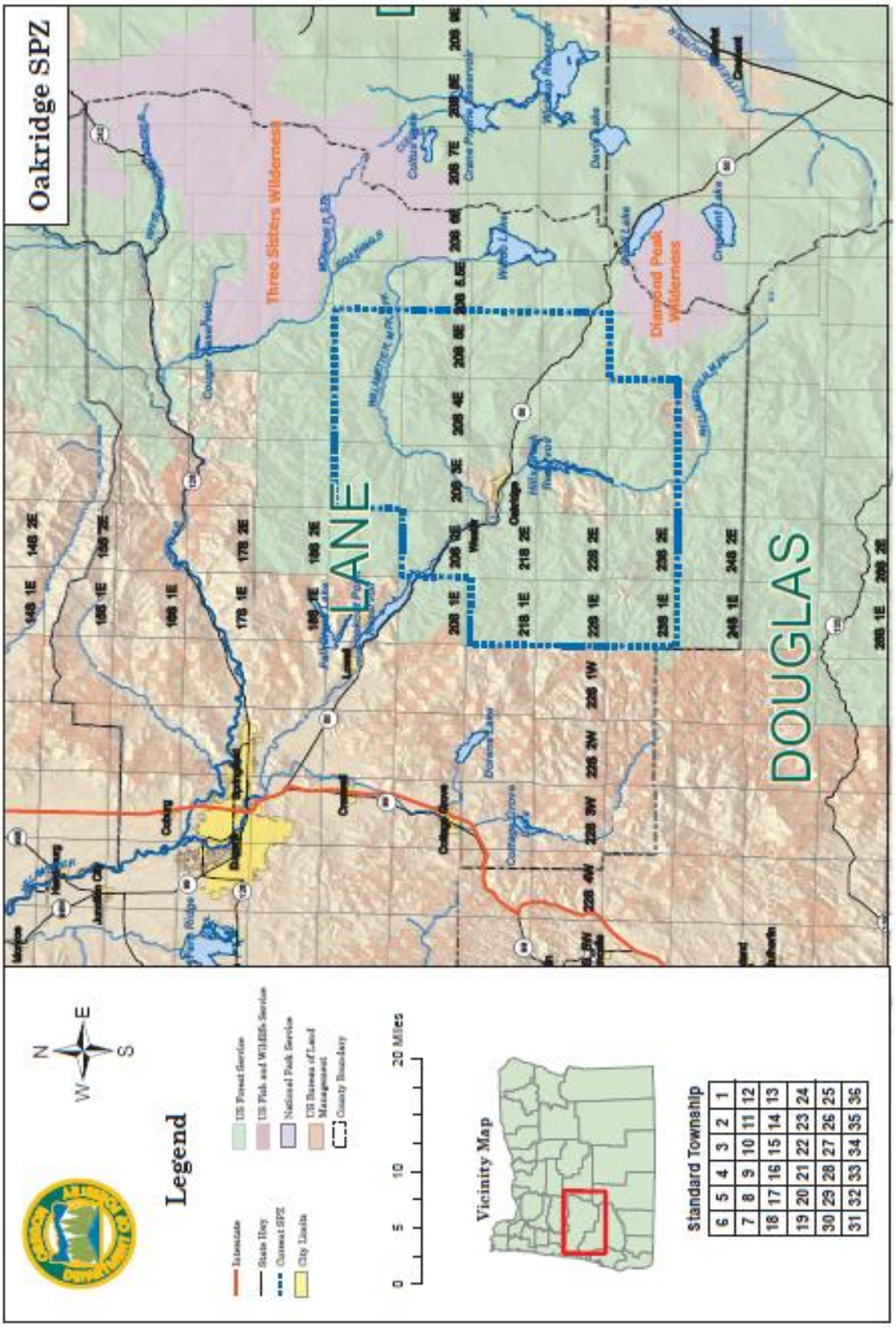
In the event any of the communities listed above violate the PM standard and prescribed burning is determined to be a significant contributor to the violation, the following provisions shall be implemented:

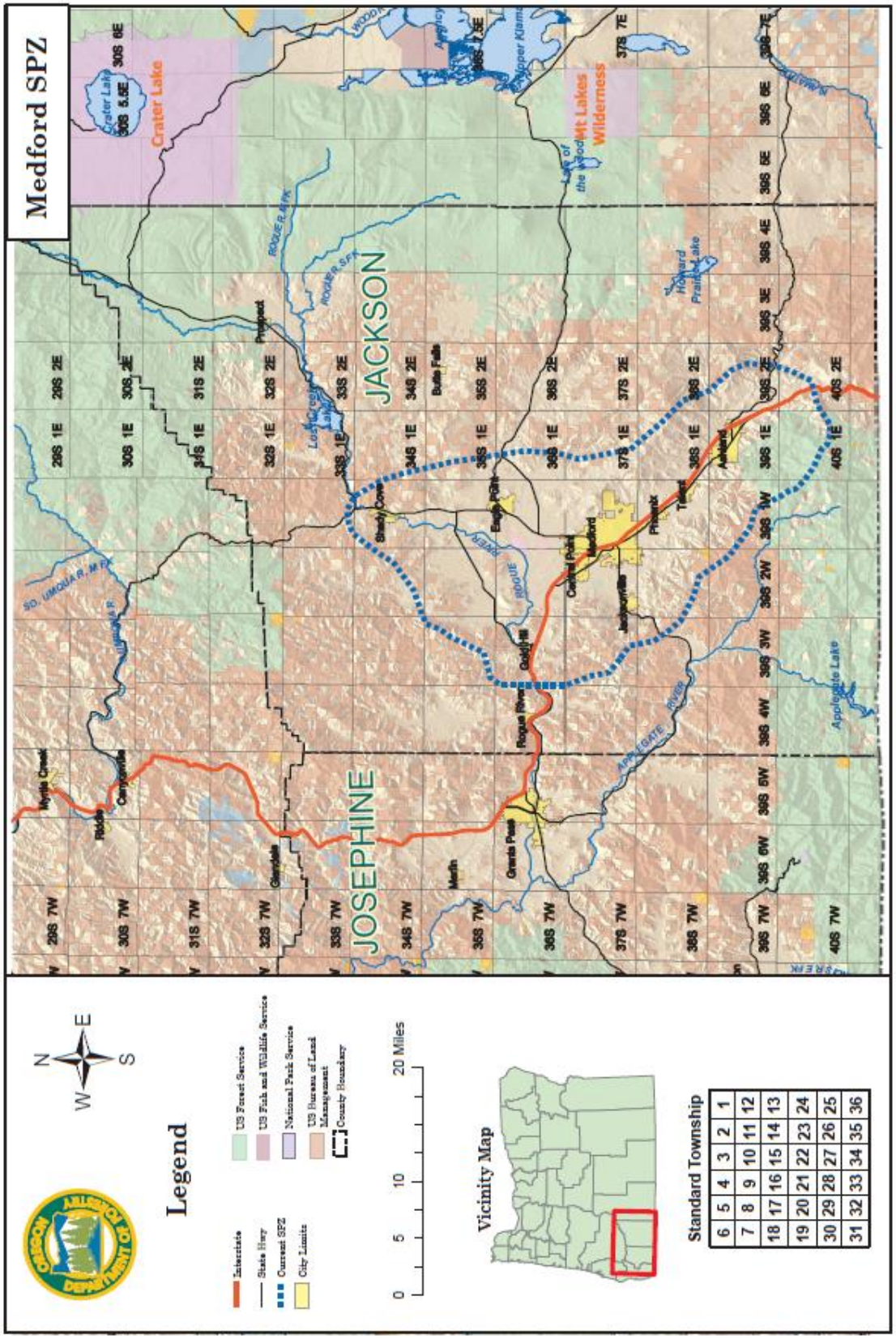
1. The SPZ boundary will be expanded to include the area from which prescribed burning could impact the PM nonattainment or maintenance area. Any boundary change will be jointly agreed to by ODF and DEQ.

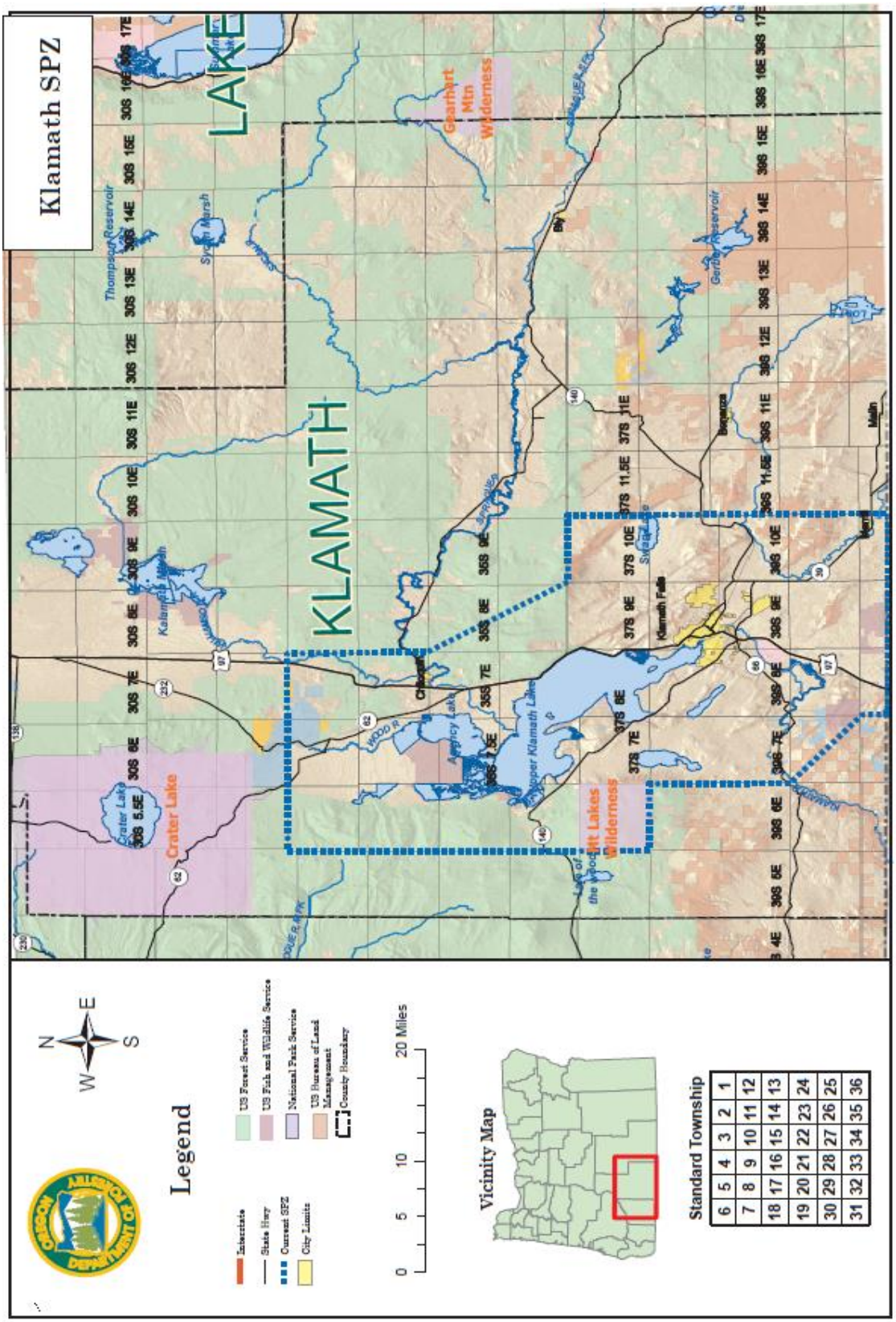
2. SPZ restrictions will apply from November 1 through March 1, except for Klamath Falls where they will apply from November 1 through April 1.

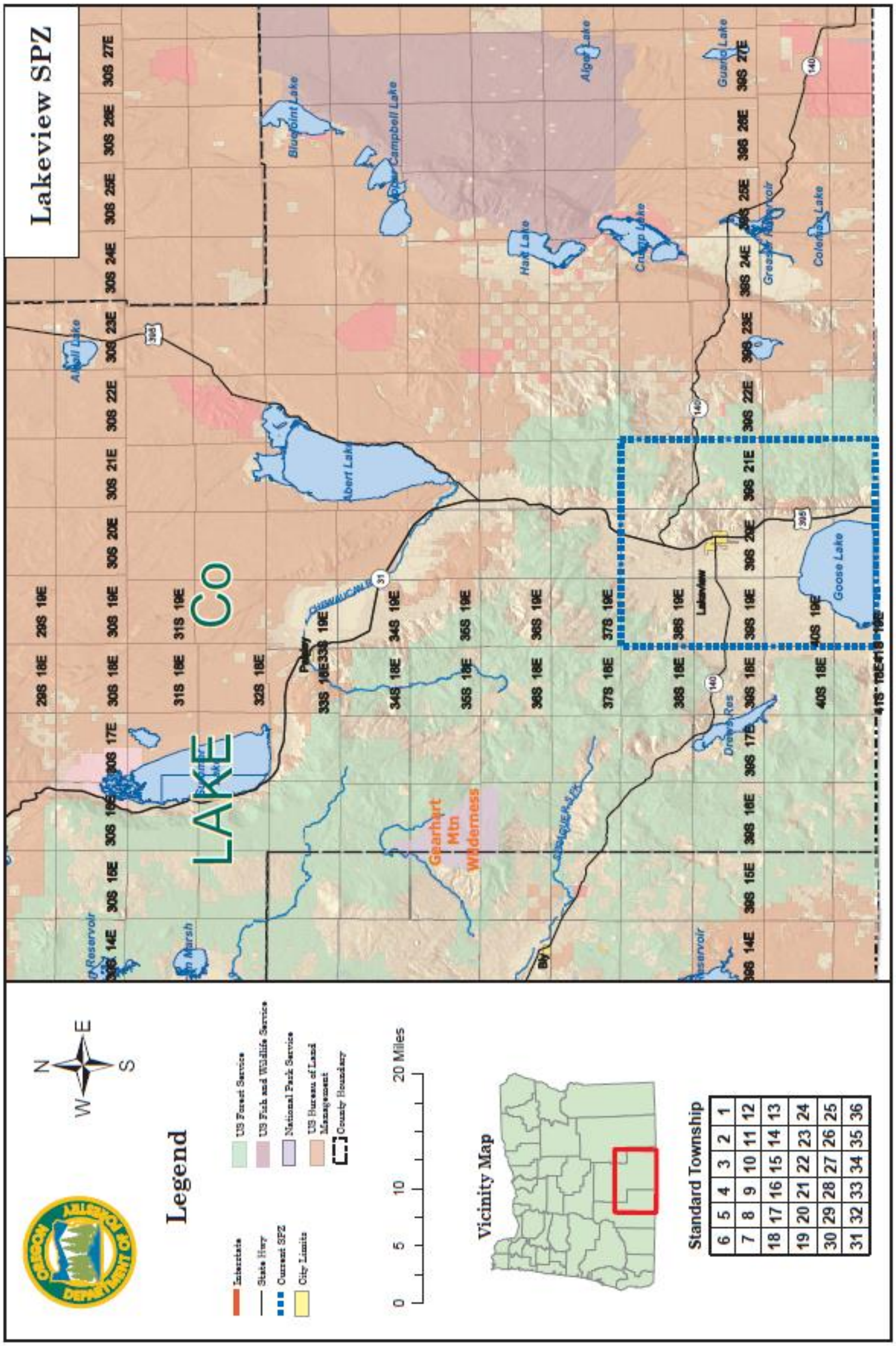
3. The SPZ for Klamath Falls and Lakeview, as well as all future PM nonattainment areas in areas of level 2 regulation under the Oregon Smoke Management program, shall be subject to burning requirements of Level 1 regulation during the time when the SPZ is in effect.

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
LANE
DOUGLAS
Three Sisters Wilderness
Diamond Peak 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
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


Medford SPZ
JOSEPHINE
JACKSON
Crater Lake
Mt Lakes Wilderness
Legend
US Forest Service
US Fish and Wildlife Service
National Park Service
US Bureau of Land Management
County Boundary
Interstate
State Hwy
Current SPZ
City Limits
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


Klamath SPZ
KLAMATH
LAKE
Crater Lake
Gearhart Mtn Wilderness
Mountain Lakes Wilderness
Legend
US Forest Service
US Fish and Wildlife Service
National Park Service
US Bureau of Land Management
County Boundary
Interstate
State Hwy
Current SPZ
City Limits
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


Lakeview SPZ
LAKE Co
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
Abert Lake
Goose Lake
Lakeview
Gearhart Mtn Wilderness