



United States Department of Agriculture
Forest Service

Grasshopper Restoration Project

Air Quality Report

Prepared by:
Rick Lancaster
Fuels Specialist

for:
Barlow Ranger District
Mt. Hood National Forest

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1.0 Introduction

Part of the Grasshopper planning area is characterized as a fire adapted ecosystem, historically having frequent, low intensity wildland fires. Given that frequent fires occurred in this area, one can conclude that smoke emissions were a part of the landscape.

Smoke produced from wildland fires or prescribed fires can have a considerable effect on the surrounding communities and landscape. Smoke may impact air quality and may cause a range of effects depending on duration of the emissions.

Smoke management is defined as the management of fuel treatments from forest activities so that there is no effect, or a reduced effect, to local areas surrounding the project. Project design criteria and best management practices for prescribed burning would reduce the impacts to air quality and local communities. The effects of smoke from prescribed burning and burning activity created slash piles is described in section 3.0.

In Oregon, the State Forester and the Department of Environmental Quality (DEQ) have established the Oregon Smoke Management Program (OSMP). The OSMP has created a set of Smoke Management Rules for administering prescribed burning and outlining measures to protect air quality, public health and visibility (OAR 2019). The Environmental Protection Agency has approved the OSMP as meeting the requirements of the Clean Air Act, as amended.

The Department of Environmental Quality has given the Oregon Department of Forestry (ODF) the authority to manage smoke emissions. On National Forest lands, the use of prescribed burning to reduce forest fuels, whether activity generated or naturally occurring, would comply with ODF's Smoke Management Rules. These rules establish emission limits for the amount of particulate matter (PM₁₀ and PM_{2.5}) that may be released during prescribed burning. ODF has the authority to coordinate burning on agricultural and National Forest lands to minimize impacts to Smoke Sensitive Receptor Areas (SSRAs) or other areas with special legal status from visibility impairments.

Management activities would comply with all applicable air quality laws and regulations, including the Environmental Protection Agency's Regional Haze Rule, Clean Air Act, the Mt Hood Forest Plan, and the Oregon Smoke Management Program.

All prescribed burning activities would comply with Forest Service Manual direction (FSM 5100, chapter 5140).

2.0 – Analysis Framework

2.1 - Resource Indicators and Measures

Particulate matter (PM) is one of the criteria pollutants as defined by the Federal Clean Air Act (CAA). PM with an aerodynamic diameter less than 10 microns or 2.5 microns (known as PM₁₀

and PM_{2.5}) are pollutants considered harmful to public health and the environment. The CAA required the Environmental Protection Agency to set the National Ambient Air Quality Standards for criteria pollutants.

PM₁₀ and PM_{2.5} have been established as primary air quality parameters because of potential adverse human health effects and reductions in visibility. Both PM₁₀ and PM_{2.5} pollutants are released during the combustion of woody material. The major pollutant of concern in smoke, and the pollutant of most concern to fire managers, is particulate matter, especially PM_{2.5} (NWCG 2018).

2.2 - Methodology

To comply with Smoke Management Rules, the Forest Service registers all prescribed burn units in advance of ignitions. The registration includes type of burn (piles or underburn), location of burn, proximity to Smoke Sensitive Receptor Areas (SSRAs), acres to be burned and an estimate of fuel loading being reduced. The preceding information is used to calculate the estimated amount of smoke emissions that would be produced during the burn, including PM₁₀ and PM_{2.5} particulates.

After registration and prior to burning, Forest Service personnel are required to submit the unit(s) planned for burning on a given day. This information is submitted electronically to ODF. Each burn day, Forest Service personnel review the smoke management forecast and the allowable acres/tonnage available for burning. To maintain compliance with ODF's Smoke Management Rules, Forest Service personnel would not burn more than the allowable acres, or tonnage, as specified by ODF's smoke forecasters. Through compliance with ODF's Smoke Management Rules, any prescribed burning as a result of the Grasshopper project would be in compliance with CAA.

3.0 – Analysis of the Alternatives

3.1 – Existing Condition

Air quality is of particular concern on the Mt. Hood National Forest Airsheds. An airshed, as defined by the USDA Forest Service, is a geographic area that, because of topography, meteorology and/or climate, is frequently affected by the same air mass. The Mt. Hood Wilderness is federally designated as a Class I area, providing visibility protection under the Environmental Protection Agency's Regional Haze Rule and the Federal Clean Air Act (OAR 2019). The Mt. Hood Wilderness is approximately 5 miles west/northwest of the Grasshopper project's planning area. The Badger Creek Wilderness, a Class II area, borders the Grasshopper planning area to the north.

In addition to the Class I areas, there are two designated Smoke Sensitive Receptor Areas (SSRAs) near the Grasshopper planning boundary. These include the city of The Dalles, OR, and the Columbia River Gorge National Scenic Area. Both of which are approximately 25 miles north

of the Grasshopper project boundary. SSRAs are provided the highest level of protection under Oregon's Smoke Management Plan.

While not listed as SSRAs, the surrounding communities of Wamic, Tygh Valley, Sportsman's Park, Pine Hollow, Pine Grove and Maupin would likely be most impacted by smoke generated in the planning area.

3.2.1 – Effects of No Action

Under the no action alternative, no activity fuels are generated and no prescribed burning is implemented. As a result, there would be no direct effect to air quality and human health. No fuels reduction activities occur and all biomass remains available for consumption by a wildland fire. Forest fuels would continue to accumulate and the potential for a large scale wildland fire remains.

An indirect effect from taking no action would be the reduction in air quality if a large scale wildland fire occurred, which would have the potential to impact a greater area. Duration and frequency of such an event on the communities and the environment would vary immensely by weather factors, time of day, and time of year. Wildland fires tend to occur during the driest times of the year and when more forest fuels are available for consumption. As a result, wildfires have higher rates of biomass consumption and have greater potential to expose more people to smoke than prescribed fires (Navarro 2018).

3.2.2 - Direct and Indirect Effects of Proposed Action

Under the proposed action smoke would be generated during pile burning and underburning activities. All smoke emissions would be regulated each day by ODF in compliance with the OSMP and CAA requirements. Short term smoke impacts may affect local communities during prescribed fire operations. Possible impacts include decreased air quality and decreased visibility, depending on the volume of smoke and duration of emissions. Smoke can potentially impact human health through inhalation of particulate matter.

Through project design criteria, pile construction and pile burning standards have been developed to maximize burning efficiency and to minimize smoke production.

3.2.3 - Direct and Indirect Effects of Shelterwood Action

Effects to air quality for the shelterwood action would be the same as the proposed action. The shelterwood action may create more activity generated piles. However, more piles does not equate to more smoke produced on a given day. More piles may create additional days of pile burning, but smoke emissions would still be regulated by ODF in compliance with CAA requirements.

3.2.4 - Cumulative Effects

Previous projects analyzed for cumulative effects include the Rock Creek Sapling Thin and Underburn project from 2012 and the Rocky Restoration project from 2018. These projects were looked at due to their proximity to the Grasshopper Project planning area and the similarities in proposed treatments for fuels reduction. Rocky Restoration is adjacent to, and directly south of the Grasshopper planning area. Rock Creek Sapling Thin and Underburn is south and east of Grasshopper by 4 miles. Both Rocky Restoration and the Rock Creek Sapling Thin project are in implementation and are being considered in cumulative effects because proposed activities of these projects could overlap in time and space.

All three projects propose treatments that would restore fire adapted landscapes with intent to return fire to the ecosystem. An increase in prescribed fire use would affect air quality, with the potential to impact the local communities.

As previously described, smoke management is governed by the Oregon Department of Forestry through their Smoke Management Rules. The proximity of these projects to one another would not increase the amount of smoke emissions impacting residents on a given day. Daily smoke production is governed by the State of Oregon and limits are set each day for the amount of acres allowed to be ignited. Any form of prescribed burning would follow the Oregon Department of Forestry Smoke Management Rules (OAR 2019).

By following ODF's Smoke Management Rules, cumulative effects from burning activities associated with the Grasshopper project would be mitigated and remain in compliance with standards set forth by the CAA, even with other projects in the area implementing prescribed fire activities simultaneously. However, the Grasshopper project could increase the number of days when prescribed burning may occur.

Consistency Determination

The Mt Hood Forest Plan states management activities shall comply with all applicable air quality laws and regulations, including the Clean Air Act and its associated Oregon State Implementation Plan (FW 040-041). Additionally, impacts of prescribed burning on smoke sensitive areas (e.g. Federal Class I airsheds and areas designated in the Oregon State Smoke Management Plan) shall be minimized. Total particulate emissions shall be reduced consistent with goals set by the Oregon Department of Environmental Quality (FW 052-053).

By following the Smoke Management Rules, set forth by the Oregon Department of Forestry, proposed activities of both action alternatives would comply with the Mt Hood Forest Plan, including the Environmental Protection Agency's Regional Haze Rule, the Clean Air Act, and Oregon's Smoke Management Program.

5.0 - References Cited

NWCG. 2018. Smoke Management Guide for Prescribed Fire. National Wildfire Coordinating Group. NFES 1279. February 2018. (Cited in text as (NWCG 2018)).

Navarro, Kathleen M.; Don Schweizer; John R. Balmes; Ricardo Cisneros. 2018. A Review of Community Smoke Exposure from Wildfire Compared to Prescribed Fire in the United States. Atmosphere. Volume 9. (Cited in text as (Navarro 2018)).

Oregon Administrative Rules. 2019. Department of Forestry, Smoke Management Rules.

Available online at:

<https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=2849> Chapter 629, Division 048. (Cited in text as (OAR 2019)).