SOUTHERN Fire Exchange
Uniting Fire Science and Natural Resource Management

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Basic Smoke Management Practices for Prescribed Burning

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INTRODUCTION

Smoke management has become one of the leading challenges facing prescribed fire practitioners in the Southeast and the continued use of prescribed fire in the region may depend on effective smoke and emission mitigation practices. While not a comprehensive list of smoke management strategies, the 2011 USFS-NRCS guide to Basic Smoke Management Practices (BSMPs) (https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1046311.pdf) describes six basic practices that are good starting points for prescribed fire planning and operations. Elements of the six BSMPs may not apply to all burns due to variations in burn size, fuels, and potential impacts on air quality. Nonetheless, each practice should be evaluated for application on every burn even if there is a local smoke management program. This fact sheet briefly summarizes many of the key elements in the USFS-NRCS guide, but readers are encouraged to dig into the full publication to better understand how to implement each practice.

#1 EVALUATE SMOKE DISPERSION CONDITIONS TO MINIMIZE IMPACTS

Before Burning: Develop a smoke management plan for your burn, using protocols such as those described in the Introduction to Prescribed Fire in Southern Ecosystems and online models such as the VSmoke-web. Evaluate weather conditions that will be most appropriate for meeting your smoke management objectives. Analyze predicted weather conditions with regards to smoke movement and potential impacts on smoke sensitive areas (SSAs).

During Burning: Actively monitor weather conditions and forecasts and compare them to the predicted and observed on-site weather conditions and smoke dispersion.

After Burning: Continue to track weather conditions and forecasts to understand possible effects of lingering smoke from smoldering fuels.

#2 MONITOR EFFECTS OF FIRE ON AIR QUALITY

Before Burning: Assess regional air quality conditions and forecasts using online resources such as the National Weather Service, local air quality monitoring sites and EPA AirNow. If air quality is poor, consider postponing a burn until air quality conditions improve and realize that your state forestry, fire or air quality agency may already conduct this assessment as part of their burn authorization process.

Fuel type, fuel load, weather conditions and ignition techniques can all influence smoke production and dispersion. Photo by David Godwin.

During / After Burning: Monitor smoke impacts on air quality, particularly near SSAs, towns, highways and schools using resources such as field reconnaissance and monitoring reports. Larger burns may access satellites, radar, and aircraft for additional information to track smoke movement and air quality impacts.

#3 RECORD BASIC SMOKE MANAGEMENT PRACTICES, FIRE ACTIVITY AND EFFECTS

Before Burning: Track and document observed weather and air quality conditions as well as current forecasts.

During Burning: Record BSMPs used on the burn, ignition patterns, on-site weather, fire behavior, smoke dispersion and impacts, size of area burned, fuels burned, and time / date. These records can often be recorded on, or attached to, your prescribed burn plan.

After Burning: Retain records, observations and burn plans for five years after the fire in case of an inquiry or an adverse air quality impact.

#4 COMMUNICATE AND NOTIFY AUTHORITIES AND AFFECTED PUBLIC

Before Burning: Notify appropriate authorities, air quality regulators, highway patrol, fire departments, neighbors and citizens of affected SSAs of anticipated smoke and air quality impacts. Develop contingency plans for potential undesirable impacts and notify appropriate agencies of those plans.

During / After Burning: If travel corridors are, or might be, affected, provide appropriate timely smoke impact updates to authorities, highway patrol and fire departments during and after the burn. Pay close attention to smoke impacts from smoldering fuels.

#5 UTILIZE EMISSION REDUCTION TECHNIQUES WHENEVER POSSIBLE

Before Burning: Consider available emission reduction techniques when planning the burn. Possible emission reduction techniques (ERTs) include burning just prior to precipitation, limiting fuel consumption, limiting the burn area and varying ignition techniques (e.g., back fires generally produce less smoke than head fires but they also generate less plume rise). For more information on ERTs see the NWCG Smoke Management Guide listed in the resources section.

During / After Burning: Document use of ERTs employed and observed effects. Complete mop-up as quickly as possible and extinguish smoldering fuels if necessary to address any adverse impacts.

#6 COLLABORATE WITH NEARBY BURNERS TO MANAGE SMOKE EMISSIONS

Before Burning: Burn authorization agencies in several southern states determine regional emission loads as part of their authorization process however individual burn managers should collaborate to help avoid local adverse smoke impacts. In other states, burn managers can establish information sharing networks with other burn managers to coordinate burn days and cooperatively reduce acres burned when necessary to avoid adverse smoke impacts.

RESOURCES FOR BASIC SMOKE MANAGEMENT PRACTICES:

USFS-NRCS guide to Basic Smoke Management Practices (BSMPs)
(https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1046311.pdf)

VSmoke-Web
(http://weather.gfc.state.ga.us/GoogleVsmoke/vsmoke-Good2.html)

NWS Fire Weather
(https://www.weather.gov/fire/)

NWS Fire and Smoke Mapping Resources
(http://www.ospo.noaa.gov/Products/land/hms.html)

EPA AirNow! Air Quality Observations and Forecasts
(http://www.airnow.gov/)

USFS BlueSky Playground v3
(https://tools.airfire.org/playground/v3/emissionsinputs.php)

NWCG Smoke Management Guide for Prescribed Fire and Wildland Fire
(http://www.treesearch.fs.fed.us/pubs/5388)

USFS Intro to Prescribed Fire in Southern Ecosystems
(http://treesearch.fs.fed.us/pubs/41316)

NIFC National Smoke Management Resources
(http://www.nifc.gov/smoke)

NWCG Smoke Committee (SmoC)
(http://www.wildfirelessons.net/communities/viewcommunities/groupdetails/?CommunityKey=3c1cbb43-8381-4db8-b0bb-5dfbe796173e)

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SOUTHERN Fire Exchange

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