

# STATE OF ALABAMA SMOKE MANAGEMENT PROGRAM

## I. GENERAL

This Smoke Management Program (SMP) utilizes a basic framework of requirements and procedures for managing smoke from fires managed for resource benefits developed by the State of Alabama with the cooperation and participation of land owners and managers. Historically, prescribed fires have had no significant impact on air quality or visibility in Alabama, but this SMP will list actions to be taken if they do in the future. This SMP also serves as a coordinating document between the Alabama Department of Environmental Management and the Alabama Forestry Commission, the two State of Alabama agencies involved with the program.

## II. PURPOSES

The purposes of this SMP are to mitigate the nuisance and public safety hazards posed by smoke intrusions into populated areas; to prevent deterioration of air quality and NAAQS violations; and to address visibility impacts in mandatory Class I Federal areas.

## III. ROLE OF PRESCRIBED BURNING IN ALABAMA

Prescribed burning, the controlled use of fire under specific conditions to accomplish resource management objectives, has had a long history in Alabama. The Native Americans used controlled fire to improve wildlife habitat and forest visibility, as well as to clear land for agriculture. Early settlers also burned the woods extensively, for visibility, pest prevention and improved forage for cattle. In the 1920's Alabama began to implement forest fire control programs to reduce the damage caused by these fires. Figure 1 shows the acres lost to wildfires in Alabama since 1940.

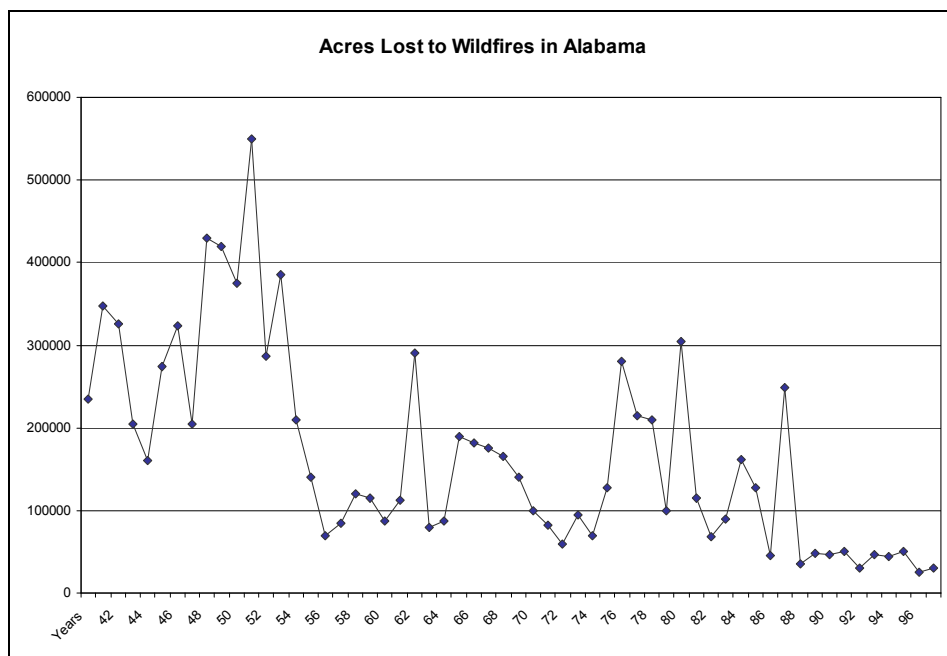


Figure 1

Organized prescribed burning was begun by the Alabama Forestry Commission (AFC) in the late 1970's as a way to reduce fire damage, improve wildlife habitat and increase the amount of reforestation in the State. Initially, nearly all burns were done by AFC employees. After several years of education and extension outreach programs, private foresters and land managers also began to use prescribed burning on their own and clients' lands. Figure 2 shows the acreage of prescribed burning in Alabama since 1990.

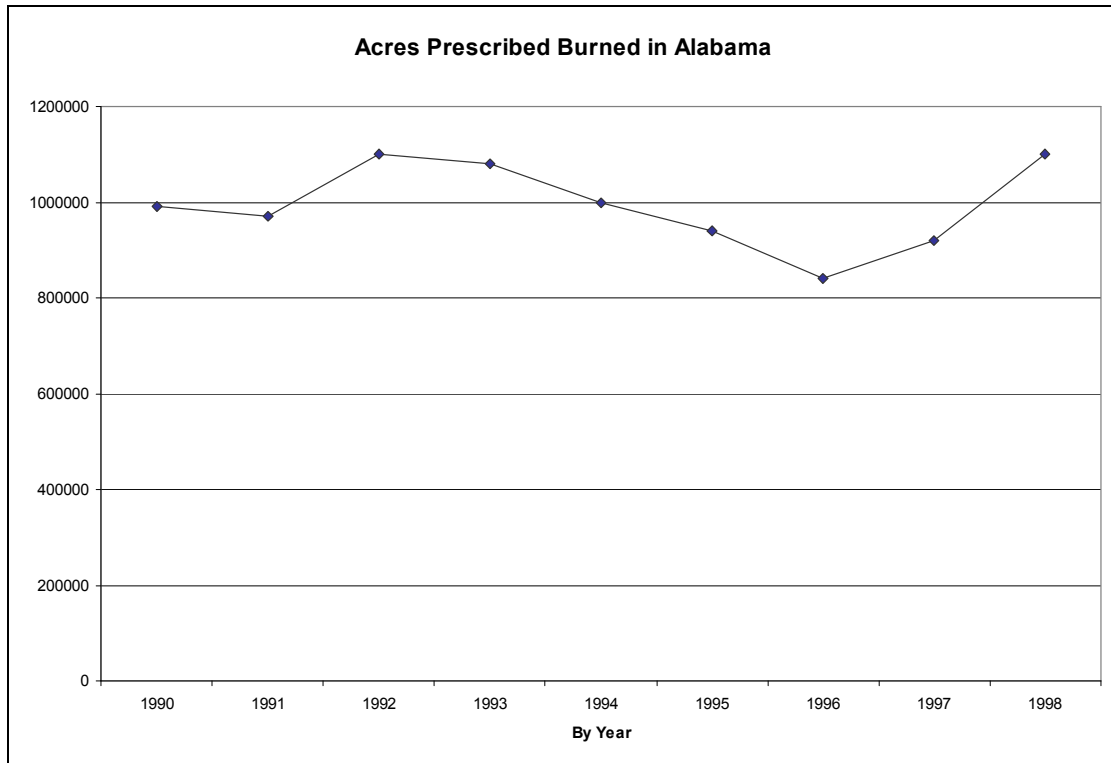


Figure 2

Prescribed burning has accomplished several goals within the state. It has helped reduce the acres lost to wildfire. It has improved wildlife habitat to the point that Alabama has all-time high populations of whitetail deer and wild turkey. It has played a critical part in the recovery of the Red Cockaded Woodpecker, endangered species, and the nearly lost Longleaf Pine-Wiregrass ecosystem. Prescribe burning is accepted by the population of Alabama as an important tool in forest resource management and is supported by the environmental community in the state as well.

In 1996, the Alabama State Legislature passed a "Right to Burn" Law that listed prescribed burning as an inherent property right for landowners. The same bill also implemented reforms in the way prescribed burn managers operated and instituted smoke management programs in Alabama.

## IV. SMOKE MANAGEMENT PROGRAM COMPONENTS

### A. Authorization to Burn

Under Alabama law, the AFC is authorized to issue Prescribed Burning Permits. Permits are required for any person, firm, association or corporation to burn woodland, grassland, fields or “new ground” that is over one-quarter (1/4) acre in size or that is done within 25 feet of continuous natural cover. Each year the AFC issues about 31,000 permits covering over 960,000 acres of prescribed burning for resource benefits.

The AFC Burning Permit System has been in place since the early 1980’s, with a major revision in the early 1990’s. The system begins with an applicant telephoning one of ten AFC dispatch centers and requesting a Burn Permit. The trained dispatcher collects information from the applicant, consults with them about weather and air quality issues, and grants the permit, issuing a unique permit number. The permit data is entered into a database and transferred to the AFC main database in Montgomery. All prescribed burning in Alabama requires a permit, for both private and public lands.

The AFC criteria for authorizing a prescribed burn for resource benefits include weather conditions, air quality, safety and the perceived ability of the permittee to control the fire. Dispatchers take time to ensure that private landowners burning on their own lands are aware of all aspects of burning, including fire control and smoke management. The AFC is authorized under state law to deny permits if there is an increased danger of uncontrolled wild fires, if the landowner appears unable to control the proposed fire, or if air quality within an airshed is already impaired.

The AFC Prescribed Burning Permit collects information on all aspects of the burning project. Basic data includes:

- Location (County, Section, Township, Range)
- Landowner and Person Responsible for Fire
- Type of Burn (fuel reduction, hardwood control, debris, agriculture, wildlife, etc.)
- Acres to be burned
- Time of burn; time permit issued; and length of burn in days
- Stagnation Index for that day and that night

The State of Alabama has a law that grants limited liability protection to all fire managers who become a Certified Prescribed Burn Manager and who develop and follow a Smoke Management Plan for the prescribed burn. This voluntary program has been widely accepted by forest managers, with over 700 burn managers being certified. To be certified, a manager must be trained in fire control and smoke management and have at least two years experience. Courses for Certified Prescribed Burners are taught by Auburn University on a semi-annual basis.

All prescribed burns for natural resource benefits that are done by Certified Prescribed Burn Managers follow a written Fire Plan (or Burning Prescription). These plans are voluntary, but give liability protection to the burner, under Alabama law. Details of these plans are found in C below.

Private landowners burning on their own land are encouraged to have a fire plan. Many of these burns are small in area (less than 10 acres) and are referred to as “de minimus’ fires. The AFC dispatcher will go over the basics with the landowner and help them put a basic plan in place. These de minimus fires do not require written fire plans.

## **B. Minimizing Air Pollutant Emissions**

As part of its overall landowner assistance and forest management assistance programs, the AFC helps landowners identify and implement the most economical and most environmentally beneficial ways to manage and develop their properties. Prescribed burning is used both for understory control and to prepare a site for reforestation after harvest. The AFC is working with landowners to use economically feasible treatments that meet their landownership objectives with minimal environmental disturbance, including minimal air pollution emissions.

The AFC has worked with landowners to reduce the amount of piling and burning done during site preparation for replanting. Instead, landowners are encouraged to use low-impact herbicides followed by a broadcast burn. This system reduces the concentration of the fuels and prevents soil movement. The result is a fire that burns quicker, with fewer emissions, especially “carry-over” smoke from fires that burn overnight.

## **C. Smoke Management Components of Burn Plans**

Alabama has a voluntary program of Prescribed Burning Plans that is utilized by Certified Prescribed Burn Managers throughout the state. Burn Plans are required if a manager wishes to be covered by Alabama’s limited liability law. Private landowners burning on their own land, or other land managers who do not wish to be covered by the lowered liability regulations, do not have to have a written burn plan. The exact details of each plan will vary based on the needs of the manager and the opportunities present on the site.

The AFC has a basic Prescribed Burning Plan (Figure 3) for its own employees, who do a significant amount of prescribed burning on private lands (for a fee). The Plan includes data on the type of fire desired, fuel conditions, topography, preferred weather conditions (including air quality) and fire control parameters.

All Burn Plans, developed by both the AFC and privately, contain basic smoke management components. These components are described in a publication, *A Smoke Screening System for Prescribed Fires in Alabama*, published by the AFC in 1992. The following discussions are taken from this document.

### **1. Actions to Minimize Fire Emissions**

The Alabama system uses basic strategies that work to “improve and reduce the burning of heavy fuels and to conduct prescribed burning in good smoke dispersion weather”. The system specifically works to reduce smoke loading. Specific actions suggested in this voluntary system include:

**ALABAMA FORESTRY COMMISSION  
PRESCRIBED BURNING PLAN**

Unit or Landowner: \_\_\_\_\_ Permit No. \_\_\_\_\_

Tract No. \_\_\_\_\_ S \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_ District \_\_\_\_\_ County \_\_\_\_\_

Acres to Burn \_\_\_\_\_ Chains to Plow \_\_\_\_\_ Previous Burn Date \_\_\_\_\_

STAND DESCRIPTION

Overstory Type \_\_\_\_\_ Height to Bottom of Crown \_\_\_\_\_

Understory Type \_\_\_\_\_

Fuel Description and Amount \_\_\_\_\_

Purpose of Burn \_\_\_\_\_ Topography & Soil \_\_\_\_\_

Intensity Desired \_\_\_\_\_ % Litter to Leave \_\_\_\_\_

Manpower Needs \_\_\_\_\_ Equipment Needs \_\_\_\_\_

Maximum Scorch Acceptable \_\_\_\_\_

List Smoke-Sensitive Areas \_\_\_\_\_

Special Precautions \_\_\_\_\_

Passed Screening System? \_\_\_\_\_

Adjacent Landowners to Notify \_\_\_\_\_

WEATHER FACTORS:

|                        | <u>Preferred</u> | <u>Alternate</u><br>(if needed) | <u>Actual</u> |
|------------------------|------------------|---------------------------------|---------------|
| Surface Winds          | _____            | _____                           | _____         |
| Transport Winds        | _____            | _____                           | _____         |
| Minimum Mixing Height  | _____            | _____                           | _____         |
| Stagnation Index       | _____            | _____                           | _____         |
| Maximum Temperature    | _____            | _____                           | _____         |
| Relative Humidity      | _____            | _____                           | _____         |
| Fuel Moisture          | _____            | _____                           | _____         |
| Starting Time          | _____            | _____                           | _____         |
| Completion of Ignition | _____            | _____                           | _____         |
| Burning Technique      | _____            | _____                           | _____         |
| Lower Litter Moist     | _____            | _____                           | _____         |

Date Burned \_\_\_\_\_

Prescription Done By \_\_\_\_\_ Chains Plowed \_\_\_\_\_

Title \_\_\_\_\_ Date \_\_\_\_\_

Figure 3

- Cut stumps low and fell snags.
- Minimize amount of logging debris by close utilization.
- Leave debris scattered, if possible, and utilize larger material.
- Use small piles (which burn quicker and cleaner) instead of windrows.
- Pile debris when dry and shake out dirt.
- Burn debris when it is dry.
- Take precautions to keep stumps and snags from burning.
- Use backing fires for less smoke production.

Besides specific guidelines published in the Smoke Screening System, the AFC has worked with landowners and resource managers to reduce the amount of windrow burning as a method of site preparation for reforestation, in favor of herbicide use followed by a broadcast prescribed burn. The resulting burns have significantly less smoke and particulate matter and also burn quicker, so that residual smoke can dissipate before nightfall.

## **2. Evaluate Smoke Dispersion**

The Alabama Smoke Screening System is a detailed evaluation done by all certified burn managers before any prescribed burn. This system lists smoke sensitive areas within the airshed of the fire, the weather conditions needed to minimize impacts, and burning techniques to minimize smoke production and maximize dispersion.

In support of this system, the National Weather Service (NWS) daily publishes a Dispersion Index, Mixing Height Levels, and Transport Winds direction and speed. These are calculated at the NWS office in Birmingham and published for regions within the state. The Dispersion Index indicates how well and rapidly smoke will be dispersed into the atmosphere, based upon atmospheric stability, mixing height, transport winds, and temperature. The Index uses a numerical rating from 1 to 100. Index values of 1 to 6 indicate severe inversion/high stability and no burning should be done. Index values close to 100 indicate very high lift and dispersion, but may indicate fire control problems.

Based upon this data, and in support of the Smoke Screening System, the AFC publishes the NWS data on its web page and verbally gives it to all applicants for a burning permit.

All prescribed burning plans developed by the AFC, and most developed by private resource managers, utilize the smoke screening system and establish specific parameters for any planned burn so as to minimize smoke emissions and impacts.

## **3. Public Notification and Exposure Reduction Procedures**

The burning plans developed under the Alabama system identify “smoke sensitive areas” and include procedures for alerting them to possible smoke impacts. Managers planning to burn large areas notify adjacent residents as well as identifiable “target” sites such as airports, hospitals, and nursing homes about their plans.

Managers who follow the Alabama Smoke Screening System and use a Prescribed Burning Plan have not had a history of local residential complaints. The AFC works closely with residents who raise concerns to mediate the issue with the burn manager. There have not been repeat offenses in this area.

Since the AFC has been involved with these activities, ADEM has noticed a significant decrease in the number of complaints concerning smoke from silvicultural activities. In the early 1970's there were approximately 15 complaints a year. Now ADEM receives less than three each year.

#### **4. Air Quality Monitoring**

The USDA Forest Service maintains and operates a speciated particulate monitor in the Sipsey Wilderness Area, the state's only mandatory Class I Federal Area. This monitor has the capability of collecting samples that can be analyzed to determine the constituents of haze. There is also a meteorological station in the area.

The ADEM maintains and operates PM<sub>2.5</sub>, PM<sub>10</sub>, and TSP monitors throughout the state. Elevated PM levels are routinely investigated by microscopically analyzing TSP and PM<sub>10</sub> filters to determine primary constituents.

The ADEM also maintains and operates other air pollution monitors in the state concerned with ozone, nitrogen oxides, carbon monoxide, and sulfur dioxide. The ADEM is capable of positioning real-time PM monitors in areas where resource burning is suspected of influencing air quality problems, but this requirement is assumed to be very rare.

#### **D. Public Education and Awareness**

The AFC has worked with the media and educators to improve the public's knowledge of the use of prescribed burning and its impact on the environment. The AFC has been joined in this effort by the Alabama Environmental Council, the Alabama League of Environmental Voters, the Longleaf Alliance and the US Fish and Wildlife Service.

The AFC does have the authority to restrict prescribed burning during periods of poor air quality and drought. This is done with appropriate public notices and media outreach. The use of the Alabama Smoke Screening System has also been explained in the media and outreach materials.

The large number of prescribed burns in Alabama, around 30,000 yearly, and their small average size (under 30 acres) precludes the AFC from publishing public advisories and results for each fire. The monitoring of the AFC and ADEM could result in various actions to address air quality and nuisance smoke problems.

#### **E. Surveillance and Enforcement**

The AFC is responsible for monitoring all fires within Alabama. It keeps all permitted burns under surveillance and enforces laws and regulations preventing unpermitted burning. The AFC can issue Unlawful Burning Notices, and can arrest repeat offenders under the Alabama Criminal Code. It can also take civil action against an unpermitted burn for fire suppression costs.

Burning plans that call for specific smoke management parameters are monitored by the AFC. If problems with smoke drift occur, the AFC will and does notify the burn manager immediately so that preventive actions can begin.

For several years ADEM has referred complaints concerning smoke from prescribed burning to the AFC for action. Their responses have been rapid and thorough.

#### **F. Program Evaluation**

The Alabama prescribed burning system of issuing permits and implementing smoke screening systems is under steady review and has had frequent refinements. The AFC has an open dialog with all stakeholders in forest management and resource protection through the Alabama Forestry Planning Committee (AFPC). The AFPC consists of leaders of all state and federal agencies that directly impact forest management in Alabama as well as representatives of environmental groups, landowners, and resource users. The AFPC was involved in the public education programs about prescribed burning and gives feedback to the AFC on ways to improve the systems.

The most recent modification to the system occurred in 1998, when following a series of discussions with various stakeholders, the AFC was given the authority to restrict the issuance of burning permits during periods of low air quality.

The AFC does not have a formal review program for its Prescribed Burning Permit System. It is not the AFC's intention, during a period of budget restriction, to begin such a program. All AFC regulations are subject to review already, following the Alabama Administrative Procedures Act.

There has been a recent occurrence that should improve prescribed burning in Alabama. The Alabama Prescribed Burning Council held its charter meeting on April 18, 2001.

#### **G. Optional Air Quality Protection**

ADEM has several options when responding to recorded and predicted violations of criteria air pollutant standards. One of these options involves open burning activities. For example, elevated ozone levels and revised standards have caused most open burning not regulated by the AFC to be halted in five counties during the summer "ozone" months.

#### **V. SUMMARY**

Smoke from managed burning and wildfires is not a serious problem in Alabama. This is primarily due to the effective programs of the AFC, which disperse and minimize periods of smoke and limit wildfires. Additionally, Alabama is not a state with as much public land as western states. This limits the volume of burning required for good forest management. Also, Federal and State authorities in Alabama have become proactive in their efforts to improve smoke management and address such issues as sprawl, changing land use and population growth. The AFC is ready to respond to smoke problems associated with prescribed burning and wildfire. The ADEM is ready to evaluate problem smoke.

Given this the \_\_\_\_\_ day of May, 2001.

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Timothy C. Boyce  
State Forester  
Alabama Forestry Commission

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Ronald W. Gore, Chief  
Air Division  
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Environmental Management