The Legal Environment for Forestry Prescribed Burning in the South: Regulatory Programs and Voluntary Guidelines

Terry K. Haines, *USDA Forest Service, Southern Forest Research Station, New Orleans, Louisiana, and* **David A. Cleaves,** *USDA Forest Service, Ecosystem Management, Washington, DC 20090.*

ABSTRACT: ***Southern states vary widely in their approaches to regulation and liability protection for prescribed burning. Most state air quality laws exempt prescribed burning from many open burning rules; however, monetary penalties are established for the rules that do apply. Forest protection laws address escaped fire and require permits or notification in all but two states. So-called "certified burner" laws have been passed in six states to limit liability for experienced burners who attend training courses and adhere to applicable air quality and forest protection laws and regulations. South. J. Appl. For. 16(3):170–174.***

Prescribed burning is a valuable land management and protection tool and a well accepted professional forestry practice. Landowners use prescribed burning for site preparation, vegetation control, fire hazard abatement, wildlife habitat improvement, and other benefits.

In recent years, an average of 4.4 million ac/yr has been prescribed-burned across the South for silvicultural purposes, roughly 7% of the area in the pine forest type. Proponents call for increased burning to enhance fire-dependent ecosystems and commercial forests and to prevent future wildfires (Mutch 1994). However, as a source of air pollutants, traffic hazards, and escaped wildfires, prescribed burning is being increasingly scrutinized and regulated.

The American people as a whole derive benefits from burning, such as reduced frequency and severity of wildfires and associated smoke emissions, control of forest insects and diseases, and enhancement of wildlife and endangered species habitat. The social costs of prescribed burning include human health hazards and highway accidents associated with smoke. Some of these costs are shifted back to the burner through: (1) regulations and permits, (2) liability claims for personal injury or property loss, (3) insurance costs, and (4) opportunity costs borne by landowners who restrict or abandon burning.

This article will describe the legal environment for prescribed burning in the southern states[1] and explore policy options to remove barriers to burning.

Methods

In late 1994 and early 1995, we canvassed State forest fire protection officials in the southern states to collect information concerning: (1) voluntary smoke management and best management practice guidelines, (2) permitting and administrative requirements, and (3) liability issues and other barriers to prescribed burning (Cleaves and Haines 1997). In addition, the states' statutory codes were researched to identify pertinent air quality, fire protection, and liability statutes and interpret their implications for forest burners. A profile for each state's legal environment was developed.

Prescribed Burning Trends

For the period 1985-1994, an average of 4.4 million ac of forestland was prescribed-burned annually in the South. In some states, industrial owners plan to burn less in the future because of increased regulation and liability risks, higher prices and better utilization standards for wood residues, the availability of chemical and mechanical alternatives, and concerns about site productivity and reductions in tree growth from burning. The demand by nonindustrial private forest landowners for burning services cannot be met because of shrinking state agency funds and workforces and shortages of insured private burning contractors (Cleaves and Haines 1997). Risk and liability concerns, accentuated by prohibitive liability insurance costs, have decreased consultants and contractors willingness to burn.

[1] Southern states include Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.

NOTE: Terry Haines is the corresponding author-Phone: (504) 867-9164; Fax: (504) 589-3961; E-mail: 74000.1041@compuserve.com. Manuscript received February 16, 1998, accepted November 9, 1998.

Burning on public lands has been increasing, and ecosystem assessments, national forest plans, and endangered species recovery efforts cal1 for further increases. Since 1982, the cost of prescribed burning has risen at twice the rate of inflation and more rapidly than the costs of other silvicultura1 and wildfire hazard reduction practices (Cleaves and Haines 1997). Some of this increase has been due to air quality regulations and the risks of liability for accidents, smoke intrusions, or escaped fires.

Legal Basis

The legal basis for regulating prescribed burning can be broken into four areas: (1) air quality law, (2) forest fire control law, (3) general tort law concerning property damage and personal injury resulting from escaping fire or drifting smoke (Hauenstein and Siegel 1980), and (4) environmental laws such as the Endangered Species Act and the Clean Water Act.

Air Quality Regulation

Air quality laws and regulations for forestry burning vary among the southern states. Prescribed burning is addressed in the open-burning sections of state air quality laws and associated administrative rules. Depending on the state, prescribed burning may be either exempt from open-burning rules or subject to many constraints (Table 1). State air quality agencies have delegated the administration of these regulations to the state forestry agencies.

Air quality regulations take the form of permits and scheduling requirements, as well as voluntary smoke management and safety guidelines. Detailed guidelines have been developed by states in their implementation of the Clean Air Act. The evolution of these programs is described in (Hauenstein 1980, Lahm 1990). The states' implementation plans outline emission limits and strategies for achieving national ambient air quality standards. The programs that affect prescribed burning have been based primarily on the control of partículate matter (PM), the primary pollutant from prescribed fires. Current standards are established for PM that is 10 microns in diameter or smaller. The 24-hr and annual average concentration standards are 150 mg/m^3 and 50 mg/m^3, respectively.

The Environmental Protection Agency has established new standards for fine particles, 2.5 microns and smaller in diameter, in addition to the current PM 10 program. Recent studies have shown that these smaller particles pose a greater health threat than coarser particles (U.S. EPA 1996). In addition, fine particles are primarily responsible for visibility impairment because of their ability to scatter and absorb light. The PM 2.5, 24-hr, and annual average concentrations standards are 50 mg/m^3 and 15 mg/m^3, respectively (U.S. EPA 1996). Most of the particles produced in forest fires are fine particles, less than 0.5 micron in size (McMahon 1984). Standards for fine particles could put prescribed burning under tighter restrictions, especially near urban areas.

The PM 10 standards have primarily affected areas in the western United States, where dust from dry soils, high levels of residential wood burning, road sanding, and power plant emissions have resulted in high concentrations of particulate matter. The PM 2.5 program may increase the number of nonattainment areas in the East (Stoneman 1996).

Hauenstein and Siegel (1981) concluded that, while the basic air quality statutes allow for strict regulation, the southern states have opted for voluntary compliance, implementing air quality considerations through voluntary smoke management guidelines. Air quality regulations for open-burning that do apply to prescribed burning in some southern states include obtaining a permit; prohibiting burns near roads and inhabited areas (setback requirements); restrictions on windrow burning; prohibiting the use of heavy, oil-based, starter fluids; invoking time of day and seasonal restrictions; or generally prohibiting activities that impair visibility (Table 1).

The southern states exempt forestry burning from many air quality regulations for open burning, but establish misdemeanor charges with monetary penalties for violations of the rules that do apply. Infractions, such as burning during air pollution emergencies, failure to obtain a permit, or creating a nuisance, can conceivably result in fines of up to severa1 thousand dollars per day. However, such fines are unlikely given the limited time frame and localized nature of air quality degradation from prescribed burning (Siegel 1981).

In most southern states, air quality laws allow additional local-leve1 ordinances (Table 1). Previous studies have alluded to a growing number of county and municipal regulations concerning slash disposal and burning (Martus 1992, Hauenstein 1980).

Forest Fire Protection Laws

General forest fire protection statutes address notification and permit requirements for open fires and precautions to reduce the risk of escaped fire. Landowners are required to either notify or get permission from the state forestry agency in al1 but two states, Arkansas and Virginia. Maximum fines for infractions of forest protection rules are $500 or less in al1 the southern states.

Most states have compiled smoke management and prescribed burning guidelines that integrate the "mandatory" provisions of the state air quality and forest fire protection statutes with voluntary, recommended practices to reduce the risk of smoke intrusion and fire escape (Table 1). The smoke management guidelines are based on USDA Forest Service research and are explained in pamphlets that are distributed to landowners and burners. The southern states also address prescribed burning methods and fireline construction in their voluntary best management practices (BMP's) for water quality protection.

Prescribed burning guidelines of the southern states commonly contain provisions in the following four areas:

1. Planning guidelines include the preparation of written fire prescriptions (burning plans), and notification and permit requirements. States vary greatly in their approaches. Written fire prescriptions are recommended in most states' smoke management guidelines, and are required in at least Alabama, Florida, Mississippi, and South Carolina to limit landowners' liability for damages from prescribed buming.

Permit and notification requirements vary among the southern states (Table 1). Most southern states require oral notification or permits. North Carolina requires permits in writing; in addition, limited burning periods are stipulated in 18 high-hazard counties. Arkansas and Virginia do not require formal permission; however, Virginia's Department of Forestry requests notification. Adjacent landowners must be notified of planned prescribed burns in North Carolina and Tennessee.

2. Scheduling requirements determine the extent to which seasonal and/or daily burning periods, or "windows," are regulated. Most states limit burning to daylight hours to minimize the chances of nighttime atmospheric inversions trapping smoke (Table 1). All states reserve the right to prohibit open burning during severe droughts or air pollution emergencies.

3. Burn parameter guidelines address fuel types and accumulation levels, distance and direction to human improvements, and type or quantity of smoke produced. Two common prohibitions are against starting fires with smoke-producing agents or burning windrows that contain large amounts of soil. Many states require that adequate tools, machinery, and personnel be on hand to control the burn, and several require that the watch continue until the burn is extinguished (Table 1). In at least five states, Alabama, Florida, Oklahoma, South Carolina, and Virginia forest protection laws specify that firelanes must be plowed around the area to be burned if natural firebreaks do not exist.

4. Safety precautions are measures prescribed for monitoring smoke and fire in relation to areas of human activity and for warning the public near roads, residences, and health care facilities about smoke hazards (Table 1).

Liability Issues and Policies

Prescribed burners are exposed to liability in at least three ways: (1) escaped fires, (2) smoke intrusions into nearby communities, and (3) smoke-related highway accidents. These events are rare, but can result in catastrophic losses and costly litigation. Highway accidents pose the greatest risk in southern burning because they can involve multiple personal injuries, expensive lawsuits, and lasting public distrust. Between 1979 and 1988, at least 27 accidents in the South were allegedly attributed to smoke from prescribed fires. These accidents involved 27 fatalities, more than 50 serious injuries, and numerous minor injuries (Mobley 1990).

Table 1. Air quality and smoke management provisions for prescribed burning, southern states, 1995.

Voluntary guidelines and regulatory requirements	AL[1]	AR	FL[1]	GA[1]	LA	MS	NC	OK	SC	TN[1]	TX	VA
State notification[2]	M	V	M	M	M	M	M	M	M	M	M	V
Authorization or permit requirement	Verbal permit	Notif.	Verbal author.	Verbal permit	Verbal notif.	Verbal permit	Written permit	Verbal author.	Verbal [3]notif.	Verbal permit[4]	Verbal author.	Notif.
Local open-burning regulations that may apply to forestry burning	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO[5]	YES
Adjacent landowner, occupant, or local fire department alerted	V	NA	NA	NA	NA	V adj.own. & tire dept.	M adj.own.	V adj.own. & fire dept.	NA	M Adj.own.	NA	V Occupt. 1,000 ft.
Air quality and visibility screening	V	V	M	M	V	V	M	V	M	V	M	V
Time-of-day/seasonal restriction[6]	V	V	M	M[7]	V	M	M	V	M	NA	M	M
Fire attended at all times	M	NA	M	V	NA	NA	M	M	M	NA	NA	M
Set-back requirements [8]	NA	NA	M	NA	NA	V	M	NA	M	NA	M	V
Windrow burning restrictions as to size, number, or soil content	NA	NA	M	NA	NA	NA	M	NA	M	NA	V	NA
Certain starter fuels prohibited-heavy oil-based, rubber or asphah	NA	NA	M	NA	NA	M	M	NA	M	NA	M	M

1 Alabama and Georgia publications concerning voluntary smoke management guidelines are brief and limited in scope. Florida and Tennessee do not have state-published voluntary smoke management guidelines. Florida guidelines are included in the appendix to state open-burning regulations. These four states refer to "A Guide for Prescribed Fire in Southern Forests" (Wade and Lunsford 1989) or other references.
2 M = mandatory, V = voluntary, NA = not addressed in air quality regulations or voluntary smoke management guidelines.
3 Required in 17 counties within 5 protection areas, about 7 million ac.
4 Required October 15 through May 15.
5 Texas air quality regulations do not authorize burning within corporate limits.
6 Nighttime burning prohibited.
7 For 13 counties with populations greater than 65,000.
8 Fires cannot be set within specified distances of roads, residences, business, etc.

Liability can be classified as criminal, civil, or both (Eshee 1997). Actions that may result in criminal liability and misdemeanor charges include inadequate preparation for the burn, burning during droughts, failure to adequately clear an area around the burn, and failure to obtain a permit.

Alabama, Arkansas, Florida, Louisiana, Georgia, and North Carolina statutes simply state that prescribed burners may be criminally liable for allowing a fire to escape. The laws of Mississippi, Oklahoma, South Carolina, Tennessee, and Virginia specify that the burner may be criminally liable *if* reasonable care was not taken to contain the fire. Furthermore, in at least Alabama, Arkansas, Florida, Oklahoma, North Carolina, Tennessee, and Virginia, the burner is responsible for any suppression costs incurred by the forestry agency in controlling an escaped fire.

Criminal negligence is not a prerequisite for civil liability; avoiding civil negligence actually requires greater care than is necessary to avoid criminal negligence. Interpretations of "degree of care" or "negligence" has varied in the legal determination of liability for prescribed fire. Certain provisions of air quality or forest protection laws in Arkansas, Florida, North Carolina, Oklahoma, Texas, and Virginia assign civil liability to forestry burners for infractions of stated rules. Under these provisions, infractions of rules constitutes negligence. While under other provisions of air quality or forest protection laws in these same states (except Florida), strict liability may be imposed. These strict liability provisions assign responsibility to the burner for damages or injuries directly resulting from prescribed burns or resultant smoke ***regardless*** of the degree of care demonstrated by the burner or compliance with regulations and laws.

In Alabama, Georgia, Louisiana, and South Carolina, open burning and air quality statutes do not directly address civil liability; therefore, generally established tests for negligence would likely apply. Mississippi law restates the general negligence test by specifically assigning civil responsibility for wanton or careless negligence.

In recent years, six southern states have enacted legislation to authorize and promote the continued use of prescribed burning of forestland by limiting civil liability. Also called "certified burner" laws, these statutes are intended to provide a more favorable legal environment for forestry burning. These laws define prescribed burning as a legal and socially and ecologically beneficial activity that does not constitute a public or private nuisance. This is an important provision in areas where citizens' nuisance complaints and/or local ordinances identifying prescribed burning as a nuisance have limited burning activity. Perhaps most importantly, landowners are not liable for damages and injuries from fire or smoke, provided negligence is not proven. The first of these limited liability statutes was enacted in Florida in 1990, followed by Georgia (1992), Mississippi (1992), Louisiana (1993), and South Carolina (1994), and Alabama (1995).

Certified burner laws establish three conditions for liability protection. One condition is the presence of at least one certified burner at al1 times until the burn is completed. Burner certification and training is conducted by the state; certification requires state-sponsored training in smoke management and burn safety. In Georgia, the burn manager does not have to be certified, but must have burning experience. The second condition, in at least Alabama, Florida, Mississippi, and South Carolina, is the development of a written fire prescription or plan. The third condition is adherence to the rules and notification and permit procedures established under other laws. Because these laws are newly enacted and have not yet been tested in the courts, the scope of their impact is uncertain. However, by describing specific actions required in conducting a prescribed burn to avoid liability, these laws provide some clarification of what actions (or lack thereof) could constitute negligence in legal proceedings.

Environmental Laws

In addition to the federal Clean Air Act, other environmental laws such as the Endangered Species Act (ESA), the Clean Water Act (CWA), the National Forest Management Act (NFMA), and the National Environmental Policy Act (NEPA) have influenced burning programs.

Al1 southern states have implemented voluntary best management practice guidelines (BMP's) for forestry to comply with the CWA provisions for nonpoint source pollution control. These guidelines include erosion control and water quality protection measures for fireline construction and burn execution. State BMP guidelines for prescribed burning vary in extent and detail. Mississippi and Texas address prescribed burning in their wetlands BMP publications, as well as the general forestry BMP handbooks. The BMP's for fireline construction include: (1) preferred methods for firelines constructed near streams, (2) considerations for revegetation to control erosion, and (3) specifications for water bars, orientation of firelines, and grade considerations. Burning procedures to protect riparian areas and wildlife and endangered species are also addressed in some states.

In recent years, at least two southern states (North Carolina and Virginia), have implemented sedimentation control laws for operations resulting in nonpoint source pollution; such laws could conceivably apply to prescribed burning activity. On federal lands, USDA Forest Service protection goals derived from implementation of the ESA, CWA, and NFMA have increased burning activity but at the same time have added complexity to the burning tasks. Costs are also added throughconstraints on the size, shape and placement of burns to protect the habitat of threatened, endangered and sensitive species, streamside management zones, or other areas of concern (Cleaves et al. 1997). The ESA itself can promote or restrict the use of prescribed fire, depending on the habitat requirements of the listed species.

Implications

The legal framework for prescribed burning is becoming more complex in some southern states, requiring compliance with state air quality and fire protection laws, local regulatory controls, and to some extent environmental laws to protect endangered species and water quality. In other southern states, burning of forestland is currently subject to relatively little formal regulation. Liability for escaped fire and smoke is a source of uncertainty in all states. Perhaps the recently

enacted limited liability statutes will provide the assurance needed to maintain or expand prescribed burning activity.

Because of the increasing use of regulation to achieve environmental protection goals and the litigious nature of American society, voluntary compliance with smoke management guidelines and BMPs will likely be increasingly important in staving off negative public opinion and more stringent regulation.

Burning is being abandoned now on stands that present the most complex and highest risks of smoke or escaped fire. Without prescribed fire, these stands may be subject to an even greater risk of wildfire, insect and disease problems, and hardwood encroachment. Shifting to chemical vegetation management may be an alternative for some forest landowners, but may not be economically feasible for others. In addition, chemical and/or mechanical treatments present their own human health and environmental risks.

Increasing residential development in forested areas may exacerbate liability risks and increase public pressure against burning. Ironically, these urban interface areas pose the greatest risk of wildfire losses. An assessment of the influence of population dispersion on burning opportunities and on the comparative risks could be used to identify forest and brush areas that are strategically important in reducing overa11 wildfire hazards; owners of these areas could be targeted for technical assistance.

Policies that allow burning permits to be traded (Hahn and Lester 1989) could be useful innovations in increasingly urban areas. Burners who can control smoke at lower marginal costs would buy permits from higher cost operators, thus reducing the overa11 cost of smoke management while achieving the benefits of burning.

Potential liability was the most commonly identified deterrent to further use of prescribed fire. At present, certified burner laws appear to be the best mechanism to reduce this deterrent. However, there have been no legal interpretations by the courts on which to assess the strength and scope of these laws.

At this early stage, there are no data available to reflect whether certified burner laws have changed burning costs or practices. One benefit of certified burner laws may be that commercial insurers may be more inclined to underwrite qualified burners. Supplemental programs could enhance prescribed burning by increasing the availability of certified burners. Group insurance pools could be developed to make insurance available to qualified burners at reasonable rates. Aggregates of insured burners could also be organized to deliver burning services to NIPF landowners whose needs are not now serviced by state agencies.

Disparities in burning activity levels by forest ownership class may signal growing conflict in some airsheds. Federal agencies are increasing their burning activity to meet ecosystem management objectives. Private burners may see inequities in these increases, especially if they result in more public complaints, accidents, fire escapes, or limitations in available burning Windows. Federal agencies and private burners are beginning to organize prescribed-burning councils to coordinate burning and smoke management activities, share burning services, and educate the public.

Literature Cited

CLEAVES, D.A., J. MARTINEZ, AND T.K. HAINES. 1997. Influences on prescribed buming activity and costs in the national forest system. 1997. Draft USDA For. Serv. South. Sta. Res. Pap., New Orleans, LA.

CLEAVES, D.A., AND T.K. HAINES. 1997. Regulation and liability risk: Their influence on the practice and the price tag of prescribed buming. P. 165-183 *in* Proc. Environmental Regulation and Prescribed Fire, Legal and Social Challenges, Tampa, FL. Florida State University, Tallahassee, FL

ESHEE, W.D. 1997. Legal implications of using prescribed fire. P. 126130 *in* Proc. Environmental Regulation and Prescribed Fire: Legal and Social Challenges, Tampa, FL.

HAHN, R.W., AND G.L. LESTER. 1989. Marketable permits: Lessons from theory and practice. Ecol. Law Quart. 16(2):361–406.

HAUENSTEIN, E.B. 1980. Legal constraints on prescribed buming in the south and west. M.S. thesis, School of Forestry and Environmental Studies, Duke University. 80 p.

HAUENSTEIN, E.B., AND W.C. SIEGEL. 1981. Air quality laws in the southem states: Effects on prescribed buming. South.J.Appl.For. 5(3):132–145.

LAHM, P. 1990. Smoke management programs within the United States. Arizona Dep. of Environ. Quality. Contract Number 22xx-xxx0xx-4-6-GC-0003.

MARTUS, C.E. 1992. The distribution and objectives of local forestry-related ordinances in the United States. M.S. thesis, Virginia Tech. Univ. 308 p.

MCMAHON, C.K. 1985. Combustion processes in wildland fuels. P. 113-138 *in* Proc. Prescribed fire and smoke management in the South. Southeastem Forest Experiment Station, Asheville, NC.

MOBLEY, H.E. 1990. Summary of smoke related accidents in the South from prescribed fires. Am. Pulpwood Assoc. Tech. Rel. 90-R-l 1. 2 p.

MUTCH, R.W. 1994. Fighting tire with prescribed fire: A retum to ecosystem health. J.For. 92(11):31–33.

SIEGEL, W.C. 1985. Legal implications of prescribed buming in the South. P. 77-85 *in* Proc. Prescribed fire and smoke management in tbe South. Atlanta, GA. Southeastem Forest Experiment Station, Asheville, NC.

STONEMAN, C.S. U.S. Environmental Protection Agency. Personal communication, December 1996.

U.S. ENVIRONMENTAL PROTECTION AGENCY. 1996. EPA's proposal on the particulate matter standard. Fact Sheet. Internet. http://134.67.104.12/naaqspro/pmfact.htm

WADE, D.D., AND J.D. LUNSFORD. 1989. A guide for prescribed fire in Southern forests. USDA For. Serv., Southem Region, Atlanta. Tech. Publ. R8-TP11. 55 p.