Conservation Issues

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ABSTRACT: Prescribed fires create a wide range of exposures to liability for the individuals, groups, or agencies involved. This article examines general principles of tort law, strict liability for ultrahazardous activities, negligence per se, and volunteer and personal liability. Approaches to avoiding or mitigating liability exposure include risk avoidance, contractor-conducted prescribed fires, liability insurance, and risk management. Damage claims have resulted from escape fires, smoke-related incidents, injuries to prescribed-fire crew members, and deaths. Training standards and precautions can reduce accidents and resulting damage claims and are an important part of any prescribed fire program.

Managing Liability Exposures Associated with Prescribed Fires[1]

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[1]This article is a general review of tort liability law as it pertains to conducting prescribed fires in Illinois. Laws pertaining to this subject will vary from state to state. For specific questions legal counsel should be consulted regarding your program.

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INTRODUCTION

Any activity, even one as commonplace as driving a car, involves exposure to liability. Reasonable precautions can be taken to avoid and/or mitigate the liability expo-sure. For example, in normal driving situations, drivers avoid liability exposure by ensuring they meet regulatory requirements (have a valid drivers license), are adequately trained for the task (have completed driver training), use reasonable personal protective devices (buckle their seat belts), evaluate weather conditions (do not drive on ice-covered streets), and carry au:o liability insurance. Driving a standa;-d automobile requires using one level of precautions and training. Driving a large semi-trailer truck requires a different level of training and licensing. A driver in the Indianapolis 500 auto race would need still more advanced training and would follow more stringent safety precautions. In the same light, burning a pile of leaves in a backyard requires one level of precautions, plans, training, and equipment. Ignition of a multiacre prescribed fire re-quires a different approach.

GENERAL TORT LAW

Anyone can sue anyone for anything. Being sued, while annoying, is not the problem. Having a judgment entered against you or your agency (being ordered to pay money) is the concern. The plaintiff (the person claiming damages) will name any person, group, corporate entity, or political subdivision, however remotely involved with the prescribed fire, as defendants to broaden the possible source for monies to satisfy (pay) any judgment entered (deep pocket theory). To be successful a plaintiff must prove there was a monetary loss (e.g., medical bills), property loss (e.g., merchantable timber), lost wages, or lost use of property. The plaintiff must also prove that the acts or omissions of the defendants were the proximate cause of (reason for) the damages, that the defendants were negligent, and that the plaintiff is within the class of persons to whom a duty to protect is owed. The class of persons we are concerned with is the general unnamed public.

In a liability suit, negligence will be alleged on one of two levels: simple negligence (carelessness), which "is not an undue disregard for the rights of others" (van der Smissen 1990), or willful and wanton negligence, which requires proof of "a consciousness on the part of defendant that his [sic] conduct would naturally and probably result in injury, any intentional disregard of a known duty, or any absence of care for the life, person, or property of others such as exhibits a conscious indifference to consequences" (Hunter 1983).

Liability law does include situations (strict or unlimited liability) where defendants will be held liable and have to pay damages even when there is no evidence of negligence on their part. In these situations the plaintiff will only have to prove that there were monetary damages and that the defendant's actions (i.e., a prescribed fire) or omissions were the proximate cause of the damages. In strict or unlimited liability situations, a defendant may be morally blameless and the act fully unintentional; nevertheless, the defendant is legally at fault and will be required to satisfy any judgments entered. Strict liability would apply in cases involving employee or volunteer injuries and resulting workma:n's

compensation claims, negligence per se, violation of Fifth Amendment rights, or engaging in ultrahazardous activities.

Ultrahazardous activities are "activities that are not so unreasonable to be prohibited altogether, but are sufficiently dangerous or provide unusual risks that the law re-quires them to be conducted at the peril of the one sponsoring the activity" (van der Smissen 1990). Examples are the use of blasting agents, building water impoundments, keeping dangerous animals, and certain types of underground construction. In some cases strict liability has been applied to the intentional setting of fires (Vaughn and Omi, n.d.).

Strict and unlimited liability also applies in cases of negligence per se (in and of itself). Negligence per se arises when the act or omission that is the proximate cause of damages is an act or omission that violates a statute with criminal penalties (Vaughn and Omi, n.d.; van der Smissen 1990). For example, smoke from a prescribed fire may blow across a road, impairing visibility, which results in an automobile accident. In Illinois, prescribed fires are conducted under an open burning permit from the Illinois Environmental Protection Agency (IEPA). The permit restrictions state "open burning shall be conducted in such a manner as to not create a visibility hazard on roadways" (Illinois Environmental Protection Agency 1985). There are criminal penalties for violations of IEPA permit restrictions (Illinois Revised Statutes Chapter 3'/z, Section 1042). If smoke from a pre-scribed fire was found to be the proximate cause of an auto accident, then no finding of negligence would be necessary for the plaintiff to collect for damages.

The Fifth Amendment to the U.S. Constitution states: "Private property shall not be taken for public use without just compensation." This amendment is applied in cases where any governmental action causes damage to, or lost use of, property or improvements. Judgments for damages resulting from inadvertent burning of buildings, merchantable timber, or improvements such as fences have been entered based on Fifth Amendment claims (Vaughn and Omi, n.d.).

In lawsuits where strict or unlimited liability does not apply, one of the central issues to be decided by the court is whether, and to what degree, the defendants were negligent. To prove negligence the plaintiff will attempt to show that the defendants did not act as reasonable and prudent professionals. The reasonable and prudent professional is one who is,

> able to foresee from the circumstances a danger which presents an unreason-able risk of harm. The standard of care would be measured by the moral qualities, judgment, knowledge, experience, perception of risk and skill that a person in the capacity of a professional would have; not that of a person with the actual qualifications of the individual, but of a person competent for the position for which the individual holds oneself to be qualified (van der Smissen 1990).

Once a risk of harm is identified, the reasonable and prudent professional takes reasonable steps to prevent damages or accidents. Negligence can also be the product of an omission (failure to act). Where contention will arise in court is whether or not the actions the plaintiff will argue would have been taken by a reasonable and prudent professional are in fact reasonable or would have prevented the damages.

In some areas, Florida for example, qualification and certification procedures for persons conducting prescribed fires are set by law (Brenner and Wade 1992). In most areas the actual qualifications needed for conducting prescribed fires are not legally established. The Nature Conservancy, U.S. National Park Service (NPS), U.S. Forest Service (USFS), and many other agencies have established their own standards for use within each agency. Many agencies use the National Wildfire Coordinating Group (NWCG) Fire Fighter Training/Introduction to Fire Behavior (S-130/190) course for prescribed-fire crew members. This course was designed to be used nationwide for wildfire suppression crews. While its curriculum often must be augmented for local situations and prescribed-fire crews, its nationwide development and use for wildfire crew training give it an excellent standing if challenged in court.

Training standards for burn boss or pre-scribed fire supervisor with the USFS, NPS, and all other Department of Interior agencies require a long list of NWCG courses, including those on intermediate fire behavior, firing methods and equipment, ground tanker use, power saws, portable pumps and water use, fire supervision, basic incident command system, fire suppression tactics, fire monitoring, smoke management, ignition specialist, and a two-week burn boss course (RX-90). In the NPS system, after completing all course work, a prospective burn boss is then field certified by fuel type. This involves planning and executing prescribed fires under the direct supervision of a NPS-qualified burn boss.

Other topics, in addition to personnel training standards, that can be examined by the court in determining negligence include failure to follow practices common 'within the industry, to adhere to standards from other industries with similar risks, or to use common sense. Being able to prove that an individual and his/her agency acted as reasonable and prudent professionals is the defense against allegations of willful and wanton negligence. This is important, because the Tort Liability Re-form Act (Illinois Revised Statutes Chap-ter 85, Section 2-102) and similar statutes in some other states protect governmental agencies and employees from claims of simple negligence in many activities. For private groups or individuals, a finding of willful and wanton negligence will result in punitive or exemplary damages (amounts awarded to punish the defendant), which are awarded in addition to actual damages suffered by the plaintiff.

Case law has held that volunteers, even if not compensated, are held to the same standard of care as compensated professionals (Hartigan, n.d.). Thus, to protect both the landowner and the volunteer, volunteers must have the same type of credentials, orientation, and supervision as paid employees. The court in Wood vs Abell [268 Md. 214, 300 A. 2d 665 (1973)] held that charitable immunity did not protect a negligent volunteer (van der Smissen 1990). A landowner or agency can be sued for the actions of volunteers burning

or performing other management work on its lands. *Respondeat superior* is a legal principle that holds the master, or one who gains benefit from the actions of another, responsible for the actions of its servants. One who volunteers services without an agreement for or as an expectation of re-ward may legally be considered to be a servant of the one accepting such services. Whether a volunteer group is a servant of the agency or landowner, or is acting as an independent contractor, would be questions of fact to be adjudicated at trial (van der Smissen 1990).

In general, an employee of an agency can-not be required to satisfy (pay) judgments resulting from a liability suit. An employee may be named in the suit, but the plain-tiffs will not collect from him or her personally unless the plaintiff or the employer can prove one of the following: an *ultra vires act (i.e.,* acting outside the scope of one's employment [van der Smissen 1990], such as conducting a prescribed fire with-out authorization of the appropriate agency or organization); willful and wanton negligence; or gross misconduct by the employee. Violating written agency guide-lines would be an example of gross misconduct exhibiting willful and wanton negligence (van der Smissen 1990).

MANAGING LIABILITY EXPOSURE

There are several approaches to managing liability exposure. The least desirable is risk avoidance. With risk avoidance you do not participate in the activity that creates the liability risk (i.e., do not conduct prescribed fires). While this is not a viable approach from an ecological perspective, it is an attractive option to some agency administrators.

A second approach is to contract out the work of conducting the prescribed fire to a professional operator. A professional retains much of the liability and can be required to carry certain types of insurance coverage. Problems arise during ul-trahazardous activities, in that the owner (or the individuallgroup hiring the con-tractor) can be held liable for negligence in not selecting a contractor qualified for the type of work, or by not supervising the work to prevent hazardous situations (van der Smissen 1990).

A third approach is to carry insurance for claims that may result from prescribed fires. This type of insurance is very ex-pensive and often impossible to locate. Frequently, standard fire and casualty in-surance covering buildings will exclude damages resulting from so-called hostile fire ignited by or on behalf of the owner of the property. While this exclusion is in-tended to prevent claims for arson-set building fires, it also excludes coverage for accidental damages from prescribed fires. Many agencies are self-insured or members of risk management groups; this allows for more flexibility in deciding what types of risks are covered. However, self-insurance places an even heavier burden of responsibility on a prescribed-fire burn boss, since damages from a catastrophic incident will have to be paid from agency budgets.

The best method to reduce liability expo-sure is risk management. With risk management an individual, agency, or group will identify potential causes of damages. They then take aggressive action to pre-vent accidents, damages, and resulting damage claims. Risk management involves spending some money on prevention now to avoid spending lots of money on judgments later.

AREAS OF PAST DAMAGE CLAIMS

The types of problems that have resulted in judgments against entities conducting prescribed fires fall into three main areas: escape fires, smoke-caused damage, and accidents among prescribed fire crews.

Escape Fires

An escape fire is a prescribed fire that is not contained within the original area to be burned. For example, on May 5, 1980, at 10:30 a.m. a prescribed fire was ignited in a 2-ha area of jack pine slash near Mio, Michigan. The objective was to remove loggin, debris, and create habitat for Kirtland's warbler *(Dendroica kirtlandii).* At 12:06 p.m. sparks from the fire ignited adjacent standing jack pine timber. At 12:15 p.m. the fire jumped over Michigan Highway 33 and was declared a wildfire (named the Mack Lake fire). In the first 3.5 hours the fire advanced 12 km. In the first 6 hours, the fire took one life, de-stroyed 44 homes and buildings, and burned 8094 ha of forest. The wildfire cost approximately $300,000 to suppress and required almost 4 years and $2.5 mill-lion dollars to settle 300 different claims. Timber loss was estimated at $2 million (Nilson 1986). A 1990 escape fire in the Cleveland National Forest in Riverside County, California, resulted in $11 mil-lion in damages (Dellios 1995).

In Illinois, less extreme escape fires have resulted in minor damage to parked cars, burned utility poles, and private land burn-ing. A review of these incidents revealed common contributing causal factors in-cluding wind shifts, inadequate preparation of fire lines, and inaccurate fire behavior predictions.

Wind shifts or velocity increases can easily cause fire to cross control lines or create smoke management problems. While weather forecasting is not an exact science, the best available forecasts should be sought and utilized. A major causal factor of the Mack Lake wildfire was the forecasted passage of a cold front that caused major wind direction and velocity changes. Actual, as opposed to forecasted, conditions should be measured and fac-tored into decisions. Written prescriptions that outline acceptable ranges of weather and fire behavior should be developed for each prescribed fire. If weather or fire behavior exceed prescription parameters, prescribed fires should be cancelled or ignited areas extinguished before they get out of control.

Inadequate preparation of fire control lines is a frequent causal factor for escape fires. Inadequate preparation can be the result of restrictions on heavy equipment use in sensitive areas or inadequate budgeting of labor during the preparation of control lines. Wildland fire control standards state that fire control lines are to be free of all burnable vegetation for a width at least 1.5

times flame length (National Wildfire Coordinating Group 1981). Fire control lines include existing barriers such as streams, roads, trails, or previously completely burned areas. To provide addition-al safety, all fire control lines for pre-scribed fires should be twice as wide as the predicted flame lengths.

Skill in predicting fire behavior is an integral aspect of conducting successful pre-scribed fires. The methodology to predict fire behavior, including flame length, is described elsewhere (Stanton 1993) and should be used during the planning of prescribed fires. At times, burn bosses use areas of vegetation they anticipate will not bum or previously burned areas as part of the fire control lines. These practices may save time and effort in fire line construction, but changing conditions have caused the unexpected ignition of fuels that were predicted not to burn. The Pocket Fire occurred in Georgia in January of 1979. A tractor plow operator was burned and later died after a major wind shift pushed a prescribed fire back into previously in-completely burned areas. The escape fire was contained at 50 ha (Pyne 1984: 429-430).

Escape fires can occur when the unexpected happens. Equipment can and often does malfunction during prescribed fires, personnel assigned to the prescribed fire can turn out to be inadequately prepared, equipment requested can be unavailable, or other problems may arise. A burn boss must be able to quickly evaluate weather predictions, fire behavior predictions, and observed fire behavior in relation to wild-fire control tactics and procedures. A writ-ten prescribed fire burn plan should out-line contingency plans for reasonably foreseeable problems. These should include control of a head fire (fire moving with the wind) at the most critical control area. Prescribed fires should not be ignited unless all personnel and equipment re-sources appropriate for all contingencies are on site or immediately available. Lines of authority on prescribed fires must be clear and decided in advance. In the field of restoration ecology, decisions often come after long discussions aimed at reaching a consensus of opinion. Prescribed fires, however, require an autocratic leadership style that is uncomfortable for some individuals.

Gonzales-Caban and Bednar (1989) studied various factors affecting the costs of prescribed fires. In their study, prescribed-fire burn plans were developed for a sample of burn units by different burn bosses. The study related size of unit, slope, pre-scribed fire objective, experience of burn boss, psychological factors of the burn boss (e.g., aversion to risk), and institutional constraints (e.g., minimizing escape fire potential) to costs to execute the plans developed. The authors determined that three factors—size of unit, site characteristics, and burn boss experience—had a greater effect on costs than all other factors. Less experienced bum bosses (experience with 0–20 prescribed fires) wrote the least expensive plans calling for less personnel, equipment, or line preparation. The authors concluded that these less experienced burn bosses had not yet fully internalized the consequences and resulting costs of escape fires.

Smoke Management

Land managers have been held liable and have paid for damages caused by smoke from prescribed fires that impaired visibility and caused traffic accidents, property damage, and fatalities (National Wild-fire Coordinating Group 1985). For example, three people were killed and seven injured in a multicar chain-reaction accident on a Florida interstate highway caused by obscured vision from a 40-ha prescribed fire (Anonymous 1983). Visibility on roads up to 1 km from a pre-scribed fire should be monitored during all smoke production. Warning signs and contingency plans for road detours should be available. Standards for acceptable visibility are available and are based on the design (e.g., one- or two-way) and speed limit of the road (U.S. National Park Service 1992). The types of precautions taken by a reasonable and prudent professional would include warning signs placed along the road.

Damage claims have resulted when people adjacent to a prescribed fire had health concerns **aggravated** by smoke. Heavy smoke from a fire in **discarded** trees forced evacuation of elderly residents from a retirement home (Anonymous 1988). In a separate incident, a prescribed fire was to be conducted near a family with an infant on an apnea monitor. In addition, the next-door neighbor had smoke-sensitive asthma. Both parties feared the smoke would be so heavy to result in hospitalization. Contingency plans for the prescribed fire included budgeting for their overnight lodging costs (R. Stanton, pers. obs.).

To avoid smoke-related liability, precautions should include letters to all address-es within 305 m (0.4 km or 0.25 mile) of the prescribed fire soliciting comments and information on health conditions that might be aggravated by smoke. The responses can be used to determine proper wind directions. Phone calls should be made to sensitive residents just prior to ignition. IEPA permit restrictions state that, "persons affected by such open burning may file complaints if the burning is injurious to human, plant, or animal life, to health or to property, or unreasonably interferes with the enjoyment of life or property" (Illinois Revised Statutes Chapter 3"A, Section 9(a) and all IEPA permits). If found to be valid, these complaints could result in the denial of future permits.

Smoke management practices should include analysis of fuel loading, fuel moisture, pattern of ignition, winds aloft, atmospheric stability, and forecasted and current wind speed and direction. The smoke management section of a prescribed-fire plan should analyze the methods used to minimize impacts to smoke-sensitive areas. If needed, smoke emissions can be computer modeled using the Simplified Approach to Smoke Estimation Modeling (SASEM) program (Sestack and Riebau 1988). Even with the best available technology, political and public relations problems relating to smoke management will be harder to man-age than fire control.

Prescribed-Fire Crew Accidents

The Occupational Safety and Health Ad-ministration (OSHA) requires employers to take affirmative action to anticipate and

protect all persons from reasonably expected workplace hazards. In the case of employee injuries, strict unlimited employer liability applies. Consider the hypothetical case of a torch operator who straps two milk jugs full of drip torch fuel to his web gear. He later trips, landing on a jug, which bursts and the fuel ignites. He later dies of burns. The hypothetical employee contributed to this particular accident. Yet were the prescribed-fire program manager and burn boss aware of OSHA regulations (CFR 1910.106) concerning containers used for flammable liquids, whereby they should have provided Type I or II safety containers with self-closing lids and spark arresting screens?

OSHA will become involved in accident investigations. The South Canyon Fire in Colorado (also known as Storm King Mountain), July 8, 1994, resulted in a Notice of Unsafe or Unhealthful Working conditions alleging one willful and one serious violation (Occupational Safety and Health Ad-ministration 1995). Failure to adhere to OSHA regulations such as these would constitute negligence per se. Work rules should prohibit torch operators from filling their own torches to limit accidental spillage of flammable liquids onto the employee's clothing.

Consider the situation of felling a burning snag tree. A gasoline-powered chain saw, capable of cutting an arm off in less than two seconds, will be used adjacent to a standing, burning dead tree. Parts of the tree may fall on the operator's head. This tool throws chips hazardous to eyes and emits sounds in excess of 98 Db. What types of safety equipment would meet a prudent standard of care in this work situation? I recommend NOMEX flame-retardant clothing ($200), hard hat ($20), goggles ($10) and/or face shield with safety glasses, face neck protector ($20), chain saw chaps ($75), hearing protectors ($15), steel-toed safety boots ($75), and safety gloves ($26). The total cost for such protection in 1995 was $441. Compare these costs to workmen's compensation costs for even a minor injury with a one-day hospitalization.

Means of communications both within the prescribed-fire crew and to outside fire or emergency crews should be available throughout the prescribed-fire event. In one situation, a high school biology teacher died of a heart attack while conducting a prescribed fire. During the fire he clutched at his chest and fell to the ground. Another crew member ran about a quarter mile to a phone. By the time he returned with help, the fire had reached the victim. The victim had first-, second-, and third-degree burns, but he had died immediately from the heart attack (Anonymous 1993; S. Horlock, Landscape Naturally, Inc., Maple Park, Illinois, pers. corn.). Liability exposure would have resulted if the victim had not immediately died from the heart attack. The plaintiff's attorney would allege that a reasonable and prudent professional would have foreseen the risk of this accident and taken the reasonable precaution of having a method of communication 1 o summon help. Portable radios and cellu tar phones are simple methods to use.

Employee Health Concerns

Smoke also presents concerns to employee health. The Illinois Employee Occupational. Disease Act makes an employer liable for "any injury to health, or death, by reason of a disease contracted or sustained in the course of employment and proximately caused by the negligence of the employer" (Illinois Revised Statues Chap-ter 48, Section 172.39). Woodland smoke contains several polyaromatic hydrocarbons. Of these, benzo(a)pyrene and form-aldehyde are known human carcinogens but are present below levels of easy detection. Smoke also contains acrolein, an acrid liquid causing tears and runny eyes, as well as carbon monoxide. Carbon monoxide is a criteria pollutant with National Ambient Air Quality Standards and National Institute of Occupational Safety and Health standards, which address employee exposure limits. Some agencies have carbon monoxide monitoring programs in place to address this concern. Particulate matter of various sizes also poses problems. Particulates ranging in size from 3 to 10 microns in diameter are caught in the mouth or nose. Particulates under 2.5 microns are respired, retained in the lungs, and can cause long-term health problems (U.S. Department ofAgriculture 1991, U.S. National Park Service 1992).

A self-contained breathing apparatus (SCBA) is the only available method to totally protect against these smoke-induced health hazards. SCBA, however, are not realistic in prescribed fire situations owing to their weight, bulk, and limited time of protection. Research is currently under-way on appropriate respiratory protection for prescribed-fire workers (U.S. Department of Agriculture 1991).

CONCLUSION

Liability should be a concern for anyone involved with the use of fire as a land management tool. Some states have recognized and passed legislation to address the liability exposures created by the use of fire (Brenner and Wade 1992). Training, physical ability, safety equipment, communications equipment, and strict written plan requirements can be important steps in preventing accidents. These efforts also will allay public fears, prevent legal restrictions, reduce liability costs, and limit the likelihood that risk avoidance will become the strategy of choice in managing prescribed-fire liability questions.

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