VILLAINS TO HEROES: OVERCOMING THE PRESCRIBED BURNER VERSUS FOREST FIREFIGHTER PARADOX

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ABSTRACT

The noble and heroic "paradigm" in wildland fire protection is the firefighter who protects forest and other wildlands from attack by fire. The driptorch-lugging prescribed burner carries few of the heroic trappings of suppression personnel. In this paper, we describe the history associated with the evolution of prescribed burning in the United States. We also describe the emergence of a group of genuine prescribed burning heroes. Contemporary obstacles to getting the prescribed burning job done are described and discussed in the context of "complications of Modernism." We use three case histories from Florida, Oregon, and Lake Tahoe, California to provide examples of how prescribed burning concepts were used as alternatives to traditional fire suppression.

Citation: Murphy, James L., and Frank T. Cole. 1998. Villains to heroes: overcoming the prescribed burner versus forest firefighter paradox. Pages 17–22 *in* Teresa L. Pruden and Leonard A. Brennan (eds.). Fire in ecosystem management: shifting the paradigm from suppression to prescription. Tall Timbers Fire Ecology Conference Proceedings, No. 20. Tall Timbers Research Station, Tallahassee, FL.

INTRODUCTION

Oklahoma City, April 1995: a fireman emerges from smoke and flames carrying a small child. The photo wins a Pulitzer Prize. The image of a firefighter as hero is once again reaffirmed by the American public.

The American public, in general, loves its forests and is quick to defend against attempts to damage them. The American public wants and supports professional forest management and protection. It has been stated, on good authority, that "forestry and land management would be impossible if prescribed burns were excluded" (Pyne 1982). Prescribed burn specialists who deal with a risky and technically challenging job, should also be heroes–right? However, a comprehensive literature search failed to produce even one example or story about recent heroics associated with the task of prescribed burning.

The noble and heroic paradigm in wildland fire protection is the fireman; i.e., the firefighter who protects forests and other wildlands from attack by fire. Conversely, the drip torch-lugging prescribed burner apparently carries none of the heroic trappings of our paradigm.

But has it always been this way? Has the prescribed burner ever been a hero? How can the prescribed burner achieve that noble status accorded the heroic forest-saving firefighter?

This paper summarizes the history and controversies associated with the evolution of prescribed burning in the United States. It describes the emergence of a group of genuine prescribed burning heroes, and how practitioners keep overcoming monstrous obstacles by doing a truly heroic job of carrying out safe and successful prescribed burning programs.

ON FINDING A HERO

Some Prescribed Burning History

Prescribed burning in various forms was around for a long time before organized fire suppression. Native Americans were burning vast areas before the Spanish first entered North America (Maxwell 1910). Broadcast fire was a tool for hunting, land clearing, and a weapon of war. Early land managers in California, in fact, were accused of "Paiute forestry" when they advocated light burning (Pinchot 1972).

Prescribed burning (or broadcast fire, an 1880 term) was endorsed by the first Chief of the Division of Forestry, which became the U.S. Forest Service, Franklin B. Hough (Hough 1878). The State of New Jersey used prescribed fire to reduce fuel loading in the late 1800's (Hough 1878). Controlled burning for fire protection became standard procedure in the South during the middle and late 1800's as the piney woods were exploited for naval stores; i.e., tar, pitch and turpentine (Hawley 1964).

By the beginning of the 21st century, prescribed fire may have been more important to management of the wildland than fire suppression, especially in the Northeast, South, Southwest and in northern California (Brown and Davis 1973). However, the 1910 fires

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raged over the Northwest and changed everything. More than 3 million acres were burned. Most of these acres were covered with valuable timber. The cause of these fires was attributed to a large number of human-caused fires that coalesced into a large-scale conflagration (Brown and Davis 1973). Foresters and the general public were shocked and became extremely wary of fire in any form. There were few heroes during this period and prescribed burners were definitely not among them.

The California "Light Burning Controversy" did not produce many heroes either. As early as the 1880's light burning was pushed in northern California as a tool to reduce fuel loading and, in turn, reduce the threat of the conflagration fire (Clar 1959). Some of the first rigorous applied research studies that were undertaken in the early 1900's investigate the feasibility, role, methods, and techniques of light burning (Steen 1976). In California, there was perhaps more publicity regionally and even nationally about prescribed light burning than from other regions of the United States. Would the prescribed burning specialist, at last, achieve glory, glamour, and perhaps hero status? The new 1916 Forest Service model of "Systematic Fire Protection" with its "Economic Theory" eliminated that possibility. There was no room for "frontier burning practices" and "Paiute forestry," in the policies of systematic fire protection. The California publicity machine made sure the rest of the country heard about the lack-of-fit of "frontier burning" in contrast to the new and very professional "Systematic Fire Protection" program.

During the 1920's the burning controversy and the publicity surrounding it shifted to the South. *Sub rosa* burning continued after the 1910 holocaust, under the cloak of "administrative studies" in the South. The Forest Service, at least, saw no distinction between light burning in the pine forests of the far West and burning in the pine forests of the South. The Forest Service was determined to bring "Systematic Fire Protection" and aggressive fire control to the southern states. Forest Service Chief Greeley stated in 1928 that "Light burning is the most pressing forestry problem in the South today" (Greeley 1927). He went on to say that light burning created "conditions of uncertainty in timber growing that could not be tolerated" (Greeley 1927). Light burning in national forests was forbidden, therefore, in all but a few very rare cases.

But just at the time when it appeared that prescribed burning was doomed in the South, two unlikely heroes rocketed into national prominence. The heroes were H.H. Chapman, Dean of the Yale Forestry School, and Herbert L. Stoddard, a Wildlife Biologist working with the U.S. Biological Survey.

The economic value of forestry and forest products in the South was recognized in the late 1800's. Industrial forestry moved into the South during that period and was well under way by the turn of the century (Pyne 1982). But foresters had huge worries about the widespread decimation of longleaf pine and their inability to regenerate it. Dean Chapman, suspecting that site preparation was a major factor in longleaf pine regeneration, began a series of studies in 1910. In 1926, he published the results in his lengthy study. He concluded that periodic fire (i.e., surface burning) was important in site preparation, in fuel reduction, and in the control of Brownspot Disease (Chapman 1926). Forest Service Chief Greeley responded that ". . . the practice of light burning threatens the effectiveness of organized fire protection." At this point Dean Chapman, however, had the opponents of prescribed burning "on the ropes," although many professionals were divided with respect to their opinion about the value of fire. Enter our second hero, Herbert Stoddard, with the knockout punch.

In the late 1800's and early 1900's hunting camps on plantations flourished in the South following the hunting traditions established in Great Britain. With the decrease in prescribed burning and the increase in quasi-systematic fire protection, habitat quality suffered and the game bird populations decreased significantly. The issue achieved national prominence (Pyne 1982). Landowners became desperate and came up with the resources to research the problems of diminishing game (especially northern bobwhite *Colinus virginianus*) populations. Direction of the research was given to the U.S. Biological Survey. H.L. Stoddard was named project leader. In 1931, Stoddard published the results and conclusions of his "Cooperative Quail Study Investigation." He concluded, "Fire may well be the most important single factor in determining what animal or vegetable life will thrive in many areas" (Stoddard 1931). Suddenly, prescribed burning had scientific credibility which qualified it to become professional; i.e., part of the professional foresters' set of tools.

A few battles over prescribed burning continued in the South until the drought years of 1941–45. Conflagrations, resulting from the accumulation of the vegetative "rough" during the fire exclusion days broke all fire records. During December 1943, Forest Service Chief Lyle Watts, after inspecting fire damage in southern forests, reversed earlier prohibitions and sanctioned the use of prescribed fire on the southern national forests (Schiff 1961).

The work of our heroes Chapman and Stoddard had impact far beyond forests of the Southern Region. In fact, the southern experience with the burning controversy, including the research, provided "points of ignition" for the spread of support for the benefits of prescribed fire around the rest of the United States (Pyne 1982). As an outgrowth of the Cooperative Quail Study, Herbert Stoddard chartered the Cooperative Quail Association which became Tall Timbers Research Station in 1958. Tall Timbers has served as a national and international forum for reporting research results on prescribed fire ecology, applications, and methods. Beginning in 1962 Tall Timbers sponsored a series of fire ecology conferences that provided pivotal influence on both the professionals' and public's perception of prescribed fire as a forest management tool (Komarek 1977).

Responding to the swing of the pendulum in favor of prescribed burning, the Forest Service Fire Re-

search Laboratory at Macon, Georgia spearheaded a series of national training seminars which promoted scientific and professional information about prescribed fire through the ranks of the Forest Service. Tall Timbers Research Station leaders, H.L. Stoddard and Ed Komarek, were part of the first training seminar conducted at Macon in 1966. In 1972, at the invitation of the Southwest Interagency Fire Council (SWIFCO), Tall Timbers Research Station sent a special Task Force to the Southwest to investigate prescribed fire practices. The Task Force reported that "more controlled or prescribed burning has been done on these Reservations, and over a longer period of time, than any other area of the United States" (Biswell et al. 1973). Thus, through the advertisements and endorsements of the Task Force, a powerful message of support for prescribed burning was trumpeted both for the region and also for prescribed burning at the national level.

What a turnaround was forged by this collection of unlikely heroes. During the early 1900's many foresters thought that it would be impossible to conduct Forest Management unless prescribed burns (e.g., light burns, surface fires, etc.) were excluded. By the 1970's, however, the forestry profession was quick to defend prescribed fire as an indispensable tool of the forest manager (Pyne 1982).

The 20th century heroes of prescribed burning including H.L. Stoddard and H.H. Chapman, certainly fought the battle for prescribed fire in a noble fashion, both scientifically and professionally. They and their colleagues deserve to be regarded as heroes. But the battles are not over. The complications of modernism are creating new challenges to prescribed burning. These challenges will require a new set of heroes to develop ways that will maintain and defend prescribed fire as a fundamental tool of management and protection.

COMPLICATIONS OF MODERNISM AND OBSTACLES TO BURNING

In "Fire in America" (Pyne 1982), concluded that the "problems with prescribed fire are now two."

1. Escape fires, which begin as prescribed burns and escape when the weather changes.
2. Volume of wildland smoke, which has become a prominent effluent of industrial forestry.

Dr. Pyne's conclusions in 1982 are still germane today. During the past 15 years, however these problems have become more complicated and challenging. For example:

1. The increased problem of the urban-rural-wildland interface as people, houses, villages and towns expand into the wildlands;
2. The liability issue. The courts have ruled that the U.S. Government can be liable for negligence when it acts in a "uniquely governmental" capacity such as in the role of a "public fireman" (Pyne 1982), based on a case involving an escape fire on the Olympic National Forest in Washington state. This ruling, others like it, and a generally litigious society, have seriously limited the use of prescribed burns.
3. Lack of comprehensive understanding of wildland fire behavior. This widespread deficiency is the root cause of most fires that escape.
4. Prescribed burns and the related "stream of effects." These effects are on-site, off-site and result in consequences over time. Most prescribed burn specialists have only an appreciation for today's on-site consequences. Examples of the stream of effects are:
   a. Air quality impairment from smoke, chemicals, and particulates.
   b. Water quantity and quality impairment.
5. The public perception of prescribed burning. There is a lingering wariness about burning that has its roots in the controversies earlier in this century. The general public is still not educated about prescribed burning, nor does it generally support prescribed burning.

THE FUTURE—WILL VILLAINS BECOME HEROES?

Americans regard firefighters as heroes who defend us from enemy attack (Pyne 1982). In our case, the enemy is fire, and therefore the heroes are the firefighters. Prescribed burners do specialized work that few people know about or understand. However, when a prescribed burn escapes and it becomes a conflagration, then everyone knows about it. When this happens the heroes ride in on white horses disguised as fire engines and suppress the fires. And that's the way it's going to be, probably for a long time into the future.

So what do we do? We give up prescribed burning, and join a Hot Shot Crew, or become a Smokejumper, right? Wrong. Totally wrong!

We face the problem. We concentrate on shifting the paradigm, perhaps, not all the way to hero status but in the direction of positive achievement and a "non-villain" status. How we can get this job done, both professionally and scientifically, is the subject of the next section.

GETTING THE JOB DONE

We have discussed "Complications of Modernism" which make today's job of prescribed burning far more challenging than ever before. Nevertheless, there are burning specialists in a variety of organizations who carry out their jobs safely and effectively. We have worked with, and interviewed, four of them, and found that they put their priority emphases on:

1. A well-researched and well thought-out Prescribed Burning Plan;
2. Communicating with, informing, and educating the public and cooperators from the very beginning of a project about objectives, methods, and risks;

3. Using only trained and qualified specialists for the burning jobs.

PLANNING AND PLANS

The U.S. Fish and Wildlife Service has realized the need for training their Line Officers and Refuge Managers, to make them better qualified to deal with fire management in the 1990's. During 1992 the Fish and Wildlife Service designed, developed, and taught the course, "Fire Management for Line Officers" (USDI Fish and Wildlife Service 1991). Planning for the prescribed burn job was a fundamental part of that course which emphasized the following tasks:

1. Do a thorough research job as a foundation for the plan. Consider the following:
   —What are the possible effects of this burn, including on-site, off-site, and consequences over time? Will air and water quality be affected?
   —Who issues the burning permit?
   —What are National Environmental Policy Act (NEPA) requirements. Are there also state and local requirements relating to clean air and water, for example?
   —Produce a specific burn objective that is measurable, realistic, and has a defined time frame.
2. Put thoughtful work into the plan. Be mindful of details. One of the best defenses against possible litigation from prescribed burn consequences is a well thought-out burn plan that demonstrates managers are "acting reasonably under the circumstances." The course unit on liability points out that the burn plan should be reviewed by those actively involved in the burn. The responsible manager, or line officer, should review and certify the plan, and thus become involved in the planning, preparation, and execution of the burn.
3. Prepare a burn prescription based upon research and local experience. A prescription is "a written statement defining the conditions required under which a fire will meet the burn objective."
4. Ignition techniques must be selected carefully to achieve the fire behavior required to meet burn objectives.
5. If smoke will be a potential problem include smoke management activities in the plan.
6. Plan for escape fires. Face the fact that there is some risk of an escape fire with any prescribed burn.
7. Plan for a test fire to determine if burn conditions meet the fire prescription and specify clear criteria for the "Go-No-Go" decision.
8. Provide for postburn follow-up. Many burns are lost in the mop-up stages when only skeleton patrols are present. Also include plans for evaluating the burn so the next burn can be an even better one.

DEALING WITH PROBLEMS

Prescribed burners face more challenges than ever before. Public scrutiny and regulatory measures alone are enough to make most prescribed burners give up their jobs and focus their attention elsewhere. Below, we provide examples of three field offices who face the public and all the regulatory constraints, and still get the job done. The first example is the Merritt Island National Wildlife Refuge (MINWR) in Florida. MINWR is located within lands administered by the National Aeronautics and Space Administration (NASA) next to Kennedy Space Center. MINWR must conform to environmental quality regulations from the Fish and Wildlife Service, the State of Florida, NASA's Environmental Quality Assurance Group and one million members of the public who annually visit the Space Center and MINWR.

The second example is the Bureau of Land Management (BLM) District located in Eugene, Oregon. The district has a large prescribed burning program. When large columns of smoke from prescribed burns appeared in the fall season, people became upset with the BLM office in Eugene. Public pressure on the Oregon Department of Environmental Quality resulted in what seemed to be a severely limiting set of emission standards. Agency managers declared, "No More Burning!" But, a handful of committed prescribed burn specialists concluded otherwise, and devised ways to work with the public, and the Department of Environmental Quality, to carry out their prescribed burning programs.

Our third example is Lake Tahoe, California. Central California went through eight years of drought, from 1986 until 1994. The coniferous forests around Lake Tahoe became extremely stressed. Insects and disease increased in the forest stands. By 1992, 30–50% of the stand around the lake was dead (Gilman 1994). North Lake Tahoe and the town of Incline Village were especially concerned about the conflagration potential because most of the town is built around and within the forest. This was an extreme example of the urban-wildland interface problem. A wildfire, starting under dry late summer conditions could potentially destroy the entire town. People worked together to plan and implement risk and hazard reduction measures that significantly reduced the conflagration potential.

What were the common elements of success from the Florida, Oregon, and California case histories?

1. They got people and organizations to become involved with the problems. Instead of viewing the world as some kind of "Black Force" that was impossible to influence and work with, they reached out, contacted people and began to inform and educate them. At Lake Tahoe, a Fire Marshall for the North Lake Tahoe Fire Protection District organized the "Neighbors for Defensible Space in the Tahoe Basin." The group developed a comprehensive program for local forest management, and the system of "defensible space" (i.e., managed areas around a home with limited fuel availability which helps reduce the intensity and spread of a fire) with fuel reduction around home sites. The group reviews and endorses decisions about management techniques including prescribed fire, and reviews

prescribed fire plans. The neighbors have to coordinate input, demands, and concerns from many different agencies that are not always in agreement with each other. These agencies include the U.S. Forest Service, the states of Nevada and California, Tahoe Regional Planning Agency, North Tahoe Fire District, and the North Tahoe Chamber of Commerce.

2. Communication started early, at the beginning of each planning job. Serious attempts were made to keep cooperators informed every step of the way. Emphasis was always on explaining the "whys" and the "hows" of the burning project.
3. "Core groups" were identified among the public. These were groups of long-established residents who felt a proprietary interest in wildland activities and who could influence others. The North Lake Tahoe "Neighbors for Defensible Space" was a core group that played a vital role in influencing vacation home owners and long-term vacation home renters.
4. A priority emphasis was placed on working with the media, including newspapers, radio, and television. More emphasis was given to working with the media from the beginning stages of a project than simply waiting to explain "why" and "how" at the time a prescribed burn was actually executed.
5. Public meetings were conducted. Managers objectively presented well thought-out programs, projected professionalism, and minimized emotion. Questions and discussion were encouraged. The guiding tenet was that the public expected the professional and specialist to formulate good stewardship and management strategies, including burning programs, and explain why they were needed and to carry them out. The public did not want to make the decisions that the prescribed burn managers were getting paid to make. In the case of the Lake Tahoe Neighbors group, any decision to carry out a burn is reviewed and endorsed by the group. Such involvement results in extensive local support if an escape fire occurs.

   There is a legal reason to invite public participation in burning plan preparation. The management plans prepared by federal agencies must meet NEPA standards. Certification of public involvement is a legal requirement of NEPA. Many states have similar requirements.
6. Every opportunity for interpretive contacts was identified and exploited. Visitor groups were given orientation trips: permanent interpretive exhibits and video programs explaining the whys and hows of prescribed burning were developed. Informative brochures were developed.
7. Most importantly people didn't lie! Managers objectively and professionally explained the benefits of prescribed burning. They explained that there can be damaging costs. For example, an escape fire is always a possibility. They projected the image that *professionals* were carefully planning and preparing for prescribed burns. They convinced people that every effort was being made to minimize these potential costs.

VALUE OF QUALIFIED PERSONNEL AND UNDERSTANDING FIRE BEHAVIOR

After the Yellowstone Fires of 1988 and the Storm King Mountain, Colorado, fire tragedy of 1995, Fire Policy and Program Reviews emphasized more strict adherence to existing requirements for personnel assigned to prescribed burns. For example, prescribed fire personnel:

1. Must be trained and have successfully completed the Basic Firefighter Course (S130), Basic Fire Behavior (S190) plus Standards for Survival. In addition, each burn must have a designated prescribed fire "Burn Boss" who, in addition to satisfying training requirements, has fire experience in the fuel model identified for a particular burn;
2. Must be physically fit as determined by the step test for aerobic fitness;
3. Must wear and use protective clothing and equipment.

The State of Florida has passed legislation establishing a Certified Burner Program. Certified burners must attest that they have prepared burning plans and smoke management plans, and that they will have adequate resources to safely manage the burn. While burning under this program, one cannot be held civilly liable provided they adhere to Florida statutes and administrative code rules (State of Florida 1990).

The U.S. Fish and Wildlife Service, in addition to meeting the national federal training and experience requirements, teaches a unit on criminal and civil liability to fire management personnel. The unit emphasizes that prescribed burn managers who are responsible for prescribed burning programs are generally free from civil liability if they are acting "within their scope of duty" (including being qualified) and are "acting as a responsible and prudent professional under the circumstances." Acting according to the steps outlined in a well thought-out and approved burning plan is a good defense against possible litigation from prescribed burn consequences.

HEROES OR VILLAINS?

The firefighter who saves the country from attack by enemy fire will always be the hero. The prescribed burner will most likely never achieve that kind of hero status. But certainly H.H. Chapman, H.L. Stoddard, and E.V. Komarek and Tall Timbers personnel have worked a near-miracle of heroic proportions. In the early 1900's, perhaps up to World War II, foresters thought that American forest management would be impossible if controlled burning was allowed. By 1970, most professional foresters were united in their conviction that forestry would be impossible without the prescribed burning tool–an incredible conversion.

Today, because of these heroic specialists, we can take pride in planning and carrying out a professionally and scientifically challenging job as respected members of the Wildland Fire Management Team.

ACKNOWLEDGMENTS

We are indebted to Jerry Adams, Fire Marshall, Incline Village, Nevada, for his contributions to this paper. We also thank Wes Hunter, Fire Management Officer, Eugene District, Bureau of Land Management, Oregon, for his help.

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