THE POLITICS OF ECOLOGY: BUILDING CONSENSUS FOR PRESCRIBED FIRE

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ABSTRACT

Fire managers must build a professional, bureaucratic, and public base of support for both the ecological and political benefits of fire. To build such support at Grand Teton National Park, an interdisciplinary and interagency team is drafting a research, management, and public information program that will focus in part on the rejuvenation of our declining aspen (*Populus* spp.) groves.

Due to nearly a century of fire suppression and a large elk (*Cervus elaphus*) population, aspen groves in the area are degenerating, with limited replacement of the dying overstory. In areas where the aspen overstory is removed, either due to disease, fire, or mechanical treatment, the subsequent regeneration is heavily browsed by a large population of ungulates (primarily elk). Our evolving prescription involves burning 1000–2000 acre (405–810 hectare) blocks of sagebrush (*Artemesia* spp.)-aspen mosaic, thereby improving ungulate forage and dispersing the browsing pressure on aspen. To assess which areas should be burned, we are surveying aspen stands throughout the park and examining 5-, 10- and 20-year old burns in which previously suppressed aspen clones are successfully regenerating.

Without a prescribed fire program that is closely integrated with wildlife management goals and research, we might expect a significant loss of aspen habitat over the next 25 years. The quality of wildlife habitat, and the quality of visitors' experience, would also be expected to decline. To highlight these issues and support the goals of the prescribed fire program, we are publishing interpretive brochures and interactive Worldwide Web pages that focus on: (1) the objectives and activities of our prescribed fire program; and (2) fire effects and fire research that will provide park visitors greater insight into the role of fire in the Greater Yellowstone Ecosystem.

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FROM ANECDOTE TO POLICY: TWO EXAMPLES

During August, 1994, lightning ignited the Row Fire in the sagebrush flats of Grand Teton National Park. By nightfall, the fire was confined at 600 acres (243 hectares). The next afternoon a series of dry thunderstorms moved over the fire area. For the next six hours, the wind gusted at 35 miles per hour (40 kilometers per hour), pushing 30-foot (10-meter) flames across wetlines and roads as the fire roared toward houses and the Teton Science School. While students and residents evacuated the area, retardant aircraft, water-dropping helicopters, dozers, dozens of engines and hundreds of firefighters engaged in the battle.

For a few days, the citizens and tourists of Jackson Hole watched a wildfire as they drove the highway connecting Jackson Hole with Yellowstone. During the weeks following the fire, the sense of public approval for the Row Fire was determined by three factors that could be immediately observed: (1) In a summer marked by the deaths of wildland firefighters, no injuries were suffered; (2) no occupied houses burned (though the park lost a few historic and picturesque buildings, including the "Pfeiffer Cabins," an abandoned homestead that provided the foreground of many a Grand Teton postcard); and (3) by the second day, after a long afternoon and night of structure protection and firefighting, the Row Fire was burning relatively safely, high in the unpopulated foothills that ring the eastern valley of Jackson Hole.

Four additional factors, not so immediately noticeable, also appeared to influence the public:

1. Grand Teton National Park and Bridger Teton National Forest share a strong commitment to cooperatively managing both wild and prescribed fires, including prescribed natural fires that may cross administrative boundaries.
2. One of the local newspapers, focusing on the evacuating residents' response to the fire, presented a relatively critical review of the Row Fire; the second newspaper, by focusing on the natural *and* human drama of the fire, presented a more favorable picture of our fire management efforts and of the role of fire in the ecosystem. While most agencies prefer to avoid any bad press, I would argue that this journalistic debate forced readers (and administrators) to enter into a personal debate concerning the ecological necessity of fire versus the necessary suppression of urban interface fires. Luther Propst, a leader in the "Successful Communities" dialogue that seeks community consensus to land management issues, maintains that a community must first argue the extremes of a divisive issue before they can chart a path towards its resolution. When Jackson Hole residents debated the Row Fire, they were simply continuing the arguments of the 1988 fire season, which were really arguments that began 20

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years before the Row Fire, during 1974, when Grand Teton managed the Waterfall Canyon Fire as the National Park Service's first prescribed natural fire.

3. As the nation was beginning a debate on forest health and fuels management, the Row Fire provided two lessons of fuel reduction. As the Row Fire burned into the hills, it reached the 1988 Hunter Fire and promptly lost much of its intensity. But while it was still actively burning, the Row Fire burned through the unoccupied Aspen Ridge Ranch; due to a lack of resources and erratic fire behavior, no engines were assigned for structure protection. A few weeks earlier, though, these buildings had been the focus of a fuel reduction project. Two hours after the fire passed, with no active structure protection, we drove into the ranch. Of six structures, only one storage shed burned. And not a single life was risked to save them.
4. By June of the next year, the charred ash and sagebrush trunks sprouted with lush grasses and purple lupine (*Lupinus* sp.). By July, tourists flocked to these back roads, their cars and buses surrounded by grazing bison (*Bison bison*). In August, these tourists were joined by a Presidential motorcade so the First Family could view bison wading through belly-high forage, one year post-burn.

The Row Fire was one extreme. A year later, with Bill Clinton vacationing in Jackson Hole for golf, horseback riding, river rafting, and hiking, we were more concerned about Presidential protection than structure protection. I was in the middle of an aspen grove, surveying the regeneration, when a smoke was reported.

During 1995 rainfall was above average, and it was a hard year for natural ignitions to stay lit. This fire, we would soon discover, was an abandoned campfire. It was a routine fire in a routine year. As I drove to the fire, though, I passed the trailhead where the President and entourage were hiking. Ahead, the smoke puffed black. I radioed for the helicopter. The engine crew unrolled a hoselay. The wind increased. A second tree torched a third. Shovels of dirt seemed futile. But the dirt kept the third tree from burning a fourth. The wind died. The helicopter water drops doused the flames, and the handcrew turned initial attack into routine mopup.

This was a fire that was suppressed with relative ease. There was no need to worry the President. There were no embarrassing fires to disturb his vacation. And when the boss chooses your park for his vacation, no news is good news.

PUBLIC OUTREACH IN A PRESCRIBED FIRE PROGRAM

A lightning fire burning 3400 acres (1377 hectares) while residents evacuate ... a campfire burning half an acre while the President hikes the shores of Jenny Lake. These two fires, as unique as their details might seem to the participants, represent the range—extreme to routine—of wildland fires. These were suppression fires. The decision to suppress was based on policy and common sense. According to staffing formulas, we are expected to contain 90% of such fires with existing staff and resources and training. These fires are a bit dicey for an hour or two but hardly worth more than a paragraph in the columns of a local newspaper. The newsworthy exceptions, the unmanageable fires, are what make the long-term solution such a hard sell. The process of fuel reduction and ecological cycle is enmeshed within the label of "prescribed fire." The public wonders, if we can't put out the wildfires, then how will we manage our self-ignited prescribed fires?

Most of our fire suppression nightmares begin with high fuel loads. Fires are becoming harder to control because each year of fire suppression equals another year of unburned fuel. Research reports highlighting the ecological role of fire, and fire management plans supporting prescribed natural fires, are forgotten when a fire is burning toward something we love, such as our houses or our favorite landscape.

I teach journalism during the winter. I research, monitor, and suppress fires during the summer. Where these two fields join I have tried to draw a connection and apply the lessons of one field to the other. As a fire researcher and fire monitor, I see the beauty, the utility, the obviousness of fire's ecological role. As a journalist (and a firefighter) I am often drawn into the drama of fire, both as a natural event and as a challenge to our abilities as fire managers.

In the world of journalism (and hence in the eyes of the public, and in the polls of politicians) the maxim might go something like this: What we think is theory, what we do is news.

By this I mean, quite simply, that if we cannot put out the threatening fires, then we cannot hope to get the public to trust our theories. We are judged first by what we do. Our predictions, ecological theories, and management plans will be scrutinized until we can demonstrate our abilities at managing wildfire.

Our fire management plans must be grounded in sound ecological theory that is continually tested against the local fire effects. Above all, though, these plans must retain public confidence. This was the lesson applied so well during the Howling Fire, a prescribed natural fire in Glacier National Park. It was controversial because the summer of 1994 was an incendiary fire season. Early in the planning and public scoping process, though, fire managers promised local residents that the Howling Fire would not cross the dirt road that was parallel to the North Fork of the Flathead River. To garner public support, this "line in the sand" was essential. The Howling Fire must be a controlled fire, even though it was allowed to burn freely within its MAP (maximum allowable perimeter). For the fire monitors and managers in the field, this meant we began to contain the fire as it approached the road. We lit innumerable backfires and even called in a helicopter for a few thousand gallons of water, both because it was sound fire management and because we knew, above all else, that a single spot fire across that road might doom any future prescribed natural fires in the region.

During the process of containing this "natural fire," we discovered that the best fire ecologists must be supported by the best fire suppression specialists, and vice versa. Again, when it comes to the ecological role of fire, it matters little what we think. What matters is what we do with our ideas. Our actions are what the public sees, and what the public judges.

The first precept in prescribed fire is that you must be very good at fire suppression. The second precept is that you will only be good at fire suppression if you understand the techniques and theories of prescribed fire. The third precept is that the public (both within and outside your agency) should recognize this dual expertise. At Grand Teton, we do our best to invite the public into a decision-making process that will send ecologists to a "prescribed natural fire," and a crew of firefighters to a "wildfire."

For the public to support such complex decisions, we must show them why we do what we do. More than just a preview or review, we must demonstrate our rationale while we are actively managing a fire. We must take the time to craft a meaningful story from the chaotic progression of fire and its incident-command-system managers.

Obviously, we cannot run emergency operations from behind the desk of the Visitor's Center. Yet each day during fire season we try to demonstrate the combined credibility of all our agencies. We pursue interagency research, interagency dispatching, interagency monitoring and suppression teams. We publish, via a weekly e-mail Fire Management Update, our fire indices, our weather predictions, our expert assessment of what the future might bring us in terms of ignitions, and in terms of choices: Are we within the range of prescription conditions for a prescribed natural fire? Or are we out of prescription and committed to suppress all ignitions?

Our public information program has focused on three audiences: (1) students and educators, (2) the local community, and (3) tourists. To reach students, we have visited the Teton Science School to work with their student research teams on fire ecology projects. We present fire ecology talks to visiting environmental educators. We provide fire ecology training to park interpreters who reach tourists via their interpreters' hikes, campfire talks, and their day-to-day work at the information desk. To reach the local community (and tourists, via the local weekly newspapers) we are creating a series of one-page fire bulletins, combining photos, maps, and analysis of each significant prescribed fire. The series, entitled "Prescribed Fire at Grand Teton National Park," features sections on fire history, fire prescription, ignition techniques, and anticipated fire effects. The first bulletin highlighted the Lost Creek Prescribed Fire, a 600 acre (243 hectare) sagebrush burn which reduced sagebrush fuel loading downwind from an urban interface zone while also increasing elk and bison forage. The second bulletin focused on the Blacktail Prescribed Fire, a mile east of park headquarters and two miles north of the regional airport, with the bulletin again highlighting the use of fire as a tool for fuel reduction and habitat rejuvenation.

During 1998 we plan to build on this public information program by detailing the value of a comprehensive prescribed fire program while we review the fire effects to be observed on the 10th anniversary of the 1988 fire season. Additionally, we foresee a major opportunity to explain the ecological role of fire as we explain the newly instituted fire policy.

One aspect of this evolving public information program includes an intranet/Internet publishing program. Building upon our printed Fire Bulletin series and drawing upon our daily operational reliance on Internet-based information, we plan to publish a Fire Web Page in 1998 that will demonstrate how the principles of fire ecology influence the management of fire. This Fire Web Page will serve two purposes: (1) as an "intranet," an internal web page, we will quickly and efficiently publish fire information, both to managers and field staff, who require up-to-date technical information such as the indices and forecasts needed to manage a new ignition. This information will also reach interpreters and information officers, who need accurate and expert information if they are to tell a compelling story to the public; and (2) as an "Internet" publishing service, we will actively invite the public into the process of researching, managing, and monitoring fires and fire effects.

By blending intranet and Internet publishing, we invite the public to look over our shoulders, to observe the planning and decision-making process. The information we require to manage the fire is the information that the public needs if they are to understand (and trust) the complexities of fire management.

An example: with a few extra keystrokes, the lightning map we download after each storm can be reformatted and published as a web page. As an "intranet" graphic, viewable by staff at remote districts, this map will guide our field observers and aerial detection flights. As an "Internet" graphic, this map will allow a web browser to locate the source of a particular fire, or to simply become more aware of the frequency and focused intensity of our lightning storms. Most importantly, a hiker who has previewed his or her backcountry trip by viewing a map clustered with lightning strikes may be more likely to abandon a ridgeline perch when a storm moves across the valley.

Already, on our in-house intranet, we are publishing a weekly Fire Management Update, which includes a decision chart for prescribed natural fires and an updated summary of our pre-planned fire dispatch, based on a comprehensive review of fuel moisture and fire indices. For 1998, we plan to expand this site into a public Fire Web Page, with a focus on long-term fire effects as well as daily fire management information. This will be a tool for local and regional fire managers, but it will also allow the public to witness the complexity and objectives of fire management. An ongoing fire can be documented (and un-demonized) with regular updates of GIS-generated maps and digital photos. Long-term fire projections generated by the FARSITE fire modeling program can be compared to maps de-

tailing the actual growth of a fire. Control lines of a fire can be mapped, defusing the public's fear that the smoke column might head towards town. As immediate as a web site can be, it should also stress the long-term effects of fire: our pre- and post-fire survey photos can become before-and-after web pages, comparing the effects of fire exclusion in our decadent aspen stands with post-fire regeneration of aspen sprouts.

All of this may add a few hours to our weekly workload. Considering that any time spent in front of the computer is time spent away from the resource we value, an agency or district should assess the value of committing to such an active public information program. Is this the best use of our time? I would argue yes. If administrators are to support the difficult decisions—to manage a fire as a prescribed natural fire, to manage a fire from July until the snow falls, to approve landscape-scale prescribed fires—then they must know that the public understands and supports fire as a management tool. And if the public is to support fire, they must also understand the ecological role of fire.

FROM FIRE ECOLOGY TO PRESCRIBED FIRE: A CASE STUDY IN ASPEN

The strongest public information campaigns combine understanding and action. The campaign should articulate a precise problem and provide a preferred and creditable solution. Ecological principles must guide prescribed fire programs. But ecology alone, with its emphasis on long-term interrelated effects that can be difficult to measure and predict, will provide only one leg of support for fire as a management tool. A prescribed fire program must be built upon a professional, bureaucratic, and public base of support for both the ecological and political benefits of fire. To build such public support for the ecological role of fire at Grand Teton and in surrounding forests, we have gathered an interdisciplinary and interagency team to focus on aspen management. The team's research and management projects monitor the status of aspen stands and demonstrate the role of fire as a process that may rejuvenate the stands of aspen.

After a century of fire exclusion, many aspen stands in the area are degenerating. There is limited regeneration to replace the dying overstory. In areas where the overstory is removed, either due to disease, prescribed fires, or mechanical treatment, the subsequent regeneration from root sprouts is heavily browsed by a large population of ungulates (primarily elk). Our evolving prescription involves burning 1000–2000 acre (405–810 hectare) burn-blocks of sagebrush/aspen mosaic, thereby improving ungulate forage and dispersing the browsing pressure on aspen sprouts. To monitor long-term fire effects and assess which areas should be burn priorities, we launched an aspen survey program in 1994. In order to measure the two chief factors influencing aspen succession—fire exclusion and heavy ungulate browsing—our sampling protocol focuses on: (1) size classes of shrub and overstory aspen; (2) density of aspen sprout regeneration, correlated to the number of years that the apical bud has been browsed; (3) shrub cover; (4) conifer encroachment; and (5) flammability and probability of a successful prescribed fire

Our preliminary survey, completed during 1997, included 20 % of the park's aspen. This survey—combining input and staff from the park's Science and Resource Management Division, Bridger-Teton National Forest, the National Elk Refuge, and Wyoming Game and Fish Department—sought to provide a unified assessment of aspen regeneration in the Jackson Hole area. Results are currently being analyzed, but preliminary survey results indicate that a significant percentage of aspen habitat is reaching a critical stage. Older decadent aspen trees are dying, and the new sprouts that would regenerate the aspen clones are so heavily browsed that these aspen stands may fail to regenerate.

Successful regeneration has been documented after fires in lodgepole pine (*Pinus contorta*) stands, in which previously suppressed clones are released by a combination of post-fire sprouting and the reduction of conifer overstory. And successful regeneration has been documented after large, hot, August wildfires—such as the Row Fire—have burned aspen stands. Even amid these large-scale wildfires, though, we have noted the effect of elk browsing.

Without a prescribed fire program that is closely integrated with wildlife management goals and research, we might expect a significant loss of aspen habitat over the next 25 years. The quality of wildlife and avian habitat, and the quality of the visitors' experience, might also be expected to decline.

THE ROW FIRE, ONE YEAR LATER

Though the overstory of a substantial proportion of aspen stands are dying, many of these stands exhibit no successful regeneration; in other stands, the suckers are stunted by repeated elk browsing. In most stands, the number of root sprouts is far below the density required for successful regeneration.

A visit to the Row Fire tells a different story. At one-year post-burn, plots in the 1994 fire indicate that root sprouts are regenerating at approximately 39,000 sprouts per hectare (16,000 sprouts per acre). Research in the Jackson Hole area indicates that for fall burns, a one-year post-burn density of 41,000 sprouts per hectare (17,000 sprouts per acre) should assure successful aspen regeneration.

The wild flames, though, are old news, and aspen sprouting, as phenomenal as it may seem to a fire ecologist, is applied science, not news. It is more likely to become news, however, when these fire effects become a story. When the Teton Science School students choose to sample this rejuvenated forest as their field project, it becomes a story for 50 students. When bison discover the rejuvenated grasslands, and when tourists (including the President) discover the bison, the effects of fire become as newsworthy as the fire once was. And when we make news of fire ecology, we build public support for prescribed fire as a tool, one that is as necessary as it is ecologically appropriate.