

# Are Land Managers Applying Our Current Knowledge of Fire Ecology?

## A PANEL DISCUSSION

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**Mr. Thompson:**— When the topic of applying knowledge comes up, I think of the old saw “a little knowledge can be dangerous” with emphasis on “little.” New methods and techniques can also be used improperly, ignored, or underestimated. In the latter case, you may have heard about the fellow that traded in his crosscut saw for a new chain-saw. He wasn’t very happy with it—it was heavier than his old crosscut saw and the teeth just didn’t “bite” the wood like his old saw did. Needless to say, he was much happier with it when someone showed him how to start the engine! I might ask the question, “Is there a parallel here with our panel’s topic this afternoon?”

This panel will address the question “Are Land Managers Applying Our Current Knowledge of Fire Ecology?”

The question is an important one—it evaluates the success of an important aspect of fire research and land management. Too often new information, techniques, and ideas are ignored, underestimated, or used improperly. In dealing with potential energy sources as powerful as those released by fire and with resource values as essential as those provided by our wild lands, can we afford to be protective of the knowledge we have? What are the adverse effects of not using this knowledge properly or even ignoring it? These questions provide the perspective for our discussion today.

If we are to address our topic properly, perhaps we should take a look at how we can evaluate the application of current fire ecology knowledge. I think there are really two types of criteria that can be used—*philosophic* and *operational*.

Philosophic criteria are those related to the awareness, understanding, and acceptance by those who must apply the knowledge. It is not too hard to think of ideas or methods that failed because they could not establish a base of support in the beliefs, concepts, or attitudes of people. Operational criteria are more oriented to the nuts and bolts aspects of getting the job done. Technical comprehension, implementation methods and techniques, and skills and funding are examples.

Philosophic criteria evaluate the quality or receptiveness of an organizational or professional “seedbed” for a newly planted “seed.” Operational criteria evaluate the expertise, process, and financial

support that ensure that the germinated “seed” will prosper and become an established plant. We must succeed under both philosophic and operational criteria if we are to meet the goal of integrated fire and land management.

On our panel today we have a good cross section of land management interests, education, and experience. They will each briefly discuss the topic question and then time permitting we will have an open discussion. I am sure that each of the panelists will see the problems and opportunities in applying fire ecology knowledge differently. Hopefully, examining these problems and opportunities in light of both philosophic and operational criteria will enable us to identify the areas where improvement is most needed.

**Mr. Ferry:**— Are Land Managers applying our knowledge of fire ecology? No, to be more emphatic—hell no they aren’t. The fact that this symposium exists, where research papers are being presented, illustrates my answer of NO. If land managers were utilizing the current knowledge of fire ecology, we would be long past the research paper status and we would be hearing at this symposium reports on techniques and managers would be discussing operational budgets and what were their justifications of expenditures.

If the answer is NO, possibly the panel and audience should be addressing themselves to “Why Aren’t Land Managers Applying Our Present Knowledge of Fire Ecology?”

I think we are in the present limbo of general knowledge but limited use because of some specific action and reactions. There are a few land management locations that are integrating fire in their management scheme. Most of these locations have now, or at some time, had a specific individual on their staff who had a very strong interest in fire science. With this individual establishing the precedent, some locations have continued to use fire and have refined this application. But most fire use locations have withered under the pressure “all fire is bad” and for political or personnel reasons the interest in fire use ceased. Over the past 10 to 20 years, researchers have well defined the role fire has played in the molding of our forest environment. But staunch supporters of the “anti-fire” thoughts have con-

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tinued to stifle progress with their rich production of “why we can’t.” First, it was “all is bad” then “the public won’t accept it” or “how can we have a Smokey the Bear and be starting our own fires” and when that eroded, they produced their prize trump card, which remains unanswered, “air pollution.”

Undue amounts of interagency rivalry has also restricted progress. In parts of our country, neighboring land managers have let rivalries jaundice their view of their neighbors progressive efforts to utilize fire.

So far, all my comments have placed the blame on the land managers, but the coin has two sides and the other side places a lot of responsibility of our limbo status on the research field. To scrutinize the errors that lie with the research field, in relation to fire use, is difficult. The researchers have been active and productive and in theory have been accomplishing their role, but if the research segment is supposed to sell managers new ways and ideas about fire ecology, something is missing. Possibly we have underestimated the magnitude of the salesmanship job. The present research program is geared for reporting the pros or cons of one technique versus another, but we are dealing with a whole startling new *concept* which also required a lot of old ways to be unlearned and touches base with every aspect of wild land management. The researcher, in the atmosphere of publish or perish, grinds out papers to feed a machine that just is not geared to do the job.

Research studies and subsequent writings have centered about nature’s way of handling fire or how it was accomplished in an intensive research study but then there is a gap in transferring these thoughts to a land manager who is thinking about mass production on multiple use lands with limited time, talent and budgets. For the land manager and his staff to attempt anything, it would be a case of the blind leading the blind.

Another problem arises when the quarterly listings of research publications are circulated. It’s only natural that we circle the coded number to obtain the research paper that attracts our attention. Rarely do we circle anything other than that which we have a special interest in. Thus the passing of knowledge occurs from interested party to interested party and not to those who need to be informed.

Finally, I must criticize the way so many research bulletins are written. All too often papers are written for their research peers and hence become very elaborate and eloquent and are loaded with technical jargon.

It's easy to be negative and difficult to offer constructive criticism. I hope the panel's jobs will generate some constructive thought and get fire use out of the present status quo.

**Mr. Hudson:**— Speaking from the viewpoint of an industrial forester, I can give you a very simple answer ... *NO!*

Let me temper this answer with a few brief remarks.

Current regeneration practices on St. Regis timberlands in Montana attempt to mimic nature's use of fire for perpetuating forest ecosystems. The 1910 fires in north Idaho and western Montana provided a drastic example of nature's way of regenerating large areas of old growth forests. Many of our present commercially important stands of ponderosa pine, western larch, western white pine and lodgepole pine are the result of 1910-type fires.

Effective fire control over the past 50 years has resulted in a tremendous increase of shade tolerant species in the understories of our timberlands. In order to maintain the more open, park-like stands we have tried prescribed burning in the spring. This treatment has proved successful in obtaining stocking control.

Prescribed fire has also been successfully used for slash disposal and site preparation following harvesting activities. Strip head fires under seed trees produce favorable conditions for regeneration of intolerant species. Properly selected seed trees survive this treatment in good order and adequate restocking usually results. Besides creating a mineral seedbed free of competing vegetation, fire hazard is also adequately reduced. Such areas "green-up" quickly and are not unpleasant for viewing. Many shrub species sprout or germinate from dormant seed to provide a greatly enhanced big game habitat.

In view of all the wonderful results I have just described, you may wonder why I have responded to the panel question in a negative manner. Looking back in my career I find that much interest was shown in the use of fire in forest management in this area in the early

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1960's. This interest peaked out recently and I believe there is currently a decline in the use of fire. With all of these favorable results why is there a decline? Let's look at what I feel are some of the reasons:

1. Poorly layed-out cutting units make burning more difficult, hence more costly, and escapes more likely. Escapes are unsightly and require the additional expense of salvage sales.

2. Poor prescriptions often result in undesirable land management situations such as clearcutting followed by broadcast burning of fairly well stocked understory vegetation on severe southwest slopes.

3. Early season burning of green dozer-piled slash has resulted in many escapes. These are hard to explain and very wasteful.

4. Lack of concern for maintaining air quality, especially near heavily populated valleys has had an adverse effect on public opinion.

5. With all of the paperwork and requirements now associated with use of fire the forest manager looks for other ways to do the same job.

6. Some foresters, such as Gary Ringold of the Potlatch Corporation are disappointed with the results of fire following clearcutting. Gary states "that this condition is not the same as a wildfire burning through standing timber leaving a shade screen, protection, and a massive seed source ready to germinate in the ashes next spring." Potlatch therefore favors seed tree or shelterwood systems with mechanical scarification.

7. The vagaries of the weather has always caused problems with prescribed burning. Escapes some years and unburnt backlogs in other years are being traded off for more costly but effective mechanical methods.

I trust that foresters may retain the use of fire to accomplish objectives that are difficult to obtain by other means. This will require better planning and some restraint in where and when to use fire.

In conclusion, I feel that we have learned a tremendous amount in the role of fire in forest management in the northern Rockies. In application, its use has been varied from successful to abuse. Let me change my answer to the panel from "NO" to "Not Correctly."

**Mr. Leege:**— My experience with fire and wildlife has been greatest on the National Forests in northern Idaho and consequently my remarks are aimed at the land managers in that area. My first reaction to the question raised to this panel was to say, “hell, no,” but after reconsidering, I have to temper that answer and say instead, “not really.”

Fire *is* being used primarily for disposing of logging slash; however, some prescribed burning in the spring is being done to improve key elk winter ranges. Some wildfires are being allowed to play their natural role in a portion of the Selway-Bitterroot Wilderness Area.

Where, then, do I think the land manager is lacking in his use of present knowledge about fire ecology? Before I answer that, let's look briefly at what's known about wildfire-wildlife relationships. It is commonly accepted that elk are closely tied to the earlier stages of plant succession in northern Idaho, and I will refer mostly to this one species of animal in this paper. However, keep in mind that many other species of birds and mammals also favor the abundance of grasses, forbs and shrubs that result when dense-canopied forests are disturbed and sunlight is allowed to reach the understory.

Early records indicate that elk numbers were relatively low prior to large wildfires in the 1910-34 period. However, their numbers increased in response to the creation of low elevation brushfields where conifer forests formerly stood. It has been documented over the years that these elk populations declined as conifers reoccupied their former ranges, and while additional wildfires were being effectively controlled. Studies of prescribed burning on elk ranges were started in the mid-1960's and findings indicated that burning increased the quality and quantity of forage as it set back plant succession. Consequently, a prescribed burning program was initiated in the late 1960's and about 36,500 acres have been burned on National Forest land to date. As impressive as this figure may sound, the program is wholly inadequate to produce and maintain the large elk herds that northern Idaho is capable of supporting. Our studies have shown that beneficial results from the fires last only 10-15 years. As about 300,000 acres of winter range are in need of burning, a program of 20,000-30,000 acres should be treated annually. The largest

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amount ever burned in 1 year was 9,012 acres in 1970, while the average annual acreage burned since 1966 has been about 4,000 acres.

You might suppose that the reason for this low level of burning is inadequate financing since wildlife funding is notoriously low in the Forest Service budget. However, cooperative Idaho Fish and Game Department monies have minimized this difficulty and other problems have been more important, such as: poor burning weather, inadequate manpower, and difficult terrain; but, the primary factor hindering a more successful program is a lack of commitment on the part of the land manager to recognize his responsibility to wildlife, as dictated by the Multiple Use Act, and to get the job done. I'm referring here to the type of commitment Orville Daniels said was necessary for a fire management program to be a success. This lack of commitment is fostered by the inherent conflict between timber and elk that exists in northern Idaho. There's no denying that when an area is burned for elk browse, young conifers on the site usually do not survive. To minimize this conflict, most of the burning has been done in areas not heavily stocked with young trees, but now there are fewer of these areas remaining and the plant communities in greatest need of browse rejuvenation usually have adequate conifer regeneration for timber management purposes. As the primary Forest Service goal from the very top of their administration leans heavily toward getting the logs out, and making the annual allowable cut, is it any wonder that elk and other wildlife get only secondary consideration. It's easy to understand why the program of burning potential timberlands to promote elk browse is waning under these conditions.

Another item that I find disturbing is the failure of the land manager to do more fall burning for improving elk ranges. Research has shown that fall burning is more successful than spring burning in accomplishing what is often the primary reason for burning—regenerating redstem ceanothus, the chief winter elk browse. Nevertheless, spring burning is used almost exclusively for improving elk range. A primary reason given for not fall burning is the fear of soil damage that may occur to steep winter range slopes. However, this reasoning hardly seems valid since fall burning is used for disposing

of slash on logged areas that are often very steep. Unacceptable erosion has apparently not occurred on those areas, and we have seen little evidence of accelerated erosion on our experimental fall burns. Probably the main factor reducing the attractiveness of fall burning is the increased difficulty with fire control—and consequently the fear of accidentally destroying adjacent stands of young conifers.

Now I would like to spend a moment in dream land and expound on how I think fire should be used for elk and associated wildlife in northern Idaho.

I suggest that the land managers take inventory of those areas that have potential for elk winter ranges, based primarily on snow accumulation during an average winter. These will be relatively small acreages, constituting only about 5 percent of the National Forest Lands involved. Certain of these areas should be designated for cover to protect animals from deep winter snows and harassment by people. The remainder of the area, probably at least 75 percent of the winter range, should be scheduled for some type of treatment, employing fire as a part of that treatment. To set back succession to plant communities more suitable for elk habitat the treatments would necessarily be varied because of differences in existing vegetation, exposure, and aesthetic considerations, but would include the following: spring burning, fall burning, hand-slashing followed by fall burning, small clearcuts with fall burning of the slash, and possibly wide-spaced thinnings with slash piled and fall-burned. The treated areas would then be kept in a high browse-producing condition by repeated treatments when on-the-ground inspections revealed the need.

There are many thousands of acres of elk winter range in the Selway-Bitterroot Wilderness Area where current policies prohibit prescribed burning for the sake of elk. I would encourage forest administrators to hurry with the development of fire management plans which will allow wildfires to play their natural role over the entire wilderness. Modified fire suppression may also be feasible on National Forest land outside of wilderness where a range rehabilitation need is recognized and even planned for sometime in the future. With proper pre-fire planning, the wildfire could be used to accomplish certain management objectives at a reduced cost, and

probably much sooner than the meager wildlife funds would permit. Dave Devet indicated that this approach is working on the Francis-Marion Forest, and I think it will work here.

I don't have great hopes that these recommendations will soon be activated on National Forest lands in northern Idaho. However, there is one bright light—the fact that the original Smokey Bear retired recently. Maybe this “changing of the bears” will usher in a new era of management—one where “multiple use” is more evident on the ground, as well as on paper, and fire is allowed to benefit wildlife at a level nearer its capabilities.

**Dr. Philpot:**—The body of quality fire ecology knowledge relating to northern Rocky Mountain ecosystems, and the West in general, is still somewhat limited. For example, today's session was primarily speculative or very preliminary in nature. Nevertheless, only a small percentage of existing knowledge is being effectively applied by land managers. Let's explore some of the reasons and discuss a few solutions.

- Lack of personal commitment or acceptance of fire's role in land management.
- Lack of expertise and technical know-how
- The fire ecology knowledge is not in usable form
- Lack of administrative understanding and strong leadership
- Absence of fire ecology considerations in the basic land-use planning process.

These barriers to application of fire ecology knowledge may appear to you to be relevant to application of new knowledge in general. However, fire ecology is unique in its complexities, multifunctional aspects, and philosophical hangups. This makes fire ecology knowledge harder to understand, harder to accept, and harder to apply.

Let's look at each of these barriers a little closer.

#### LACK OF PERSONAL COMMITMENT OR ACCEPTANCE OF FIRE'S ROLE IN LAND MANAGEMENT

This barrier exists because of historical emphasis on management of wildlands with little or no consideration for the role of fire. Career development and administrative incentives have made the risks of

many fire ecology applications outweigh the rewards for successful programs. Over time this has isolated the professional knowledgeable in fire and has encouraged an ignorance of fire considerations by land managers in general.

The solution here seems to revolve around an expanded role for fire professionals, coupled with new responsibilities, incentives, and career evaluations. Training programs designed specifically for fire ecology awareness are needed for all land managers in the West, regardless of functional expertise and responsibility.

#### LACK OF EXPERTISE AND TECHNICAL KNOW-HOW

Land management and fire management professionals will be required to do a very complex job in applying fire ecology knowledge on the ground. They must understand:

- Fire and ecosystem dynamics
- Fire behavior and fire effects prediction
- Computer simulation and analysis techniques
- Methods of assessing alternatives and their consequences.

Education seems to be the obvious answer to this problem. But, it may be more complex than most people realize. Changes must be made in our forestry and conservation schools as well as within land management agencies. Courses must be designed for both fire managers with specialists in timber, wildlife, watershed, and recreation.

#### THE FIRE ECOLOGY KNOWLEDGE IS NOT IN A USEABLE FORM

It is one thing to have a body of fire ecology knowledge, and quite another to have it in an applicable form. Modern emphasis upon the so-called multiple-use management of wildlands is making the form of knowledge increasingly important. Although several good fire ecology papers were presented at this symposium, it is hard for me to see exactly how most of this information would be applied by land managers.

To make fire ecology knowledge applicable, it must:

- Be presented in the form of alternatives
- Must be related to the goals of management

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- Must consider funding and policy constraints.

Kickert has referred to the need for land managers to be involved in the problem definition process. This would be a good start for making knowledge applicable. Jack Lyon was suggesting that research output be simplified. I am reminded of something Frank Albin recently said, "*When the land manager asks research what time it is, why does the researcher tell him how to build a clock?*" Jim Lotan described a new formalized approach to forestry research called a "Research, Development, and Application Program" that is designed to bring managers and scientists together to work on problems and insure applications of the solutions. The most important part of that job is probably the *D* or development part. Development to me means putting research results into applicable packages.

#### LACK OF ADMINISTRATIVE UNDERSTANDING AND STRONG LEADERSHIP

The characteristics of this barrier include supervisors who discourage innovative approaches; proclaim support for change, but make the risks for failures unbearable; can't handle controversy; and work for the same kind of supervisor.

I don't have any specific solution for this problem. It certainly includes training, pressure from the ground up, and a change in accountability mechanisms.

#### ABSENCE OF FIRE ECOLOGY CONSIDERATIONS IN THE BASIC LAND-USE PLANNING PROCESS

Land-use plans that don't include the following kinds of information are usually barriers to fire ecology application:

- fire history
- fire's role in vegetation development and distribution
- fuel dynamics
- fire suppression capabilities.

The solution here is to develop land-use plans with multifunctional teams that include fire management professionals. Additionally, all members of this team must have an awareness of fire con-

siderations. Until these broad land-use plans recognize fire's role in management alternatives, there is little hope for building operational plans to take advantage of fire ecology knowledge.

In conclusion, I would say there is a substantial effort being made to tear down some of these barriers. But, until this job is more nearly completed, we probably won't see a great deal of fire ecology knowledge applied.

**Mrs. Thompson:**—In a technological age it becomes increasingly more difficult—and increasingly less meaningful—to give a “yes” or “no” answer to anything. If my experience were limited to the Bitterroot National Forest, where certain Forest personnel, along with individuals from the Northern Forest Fire Laboratory, Forestry Sciences Laboratory, and Forest Research have been innovative and dedicated to applying the principles of fire ecology to land management, I might have a distorted view. However, there are many instances where this is not the case. The following comments focus on some of the reasons and/or legitimate excuses for the ecological role of fire being neglected in land management planning and implementation.

#### 1. ADMINISTRATIVE INERTIA

It is administratively “comfortable” to operate within the realm of the tried, true, tested, manualized method of doing business. Pathetically, too many agency employees prefer being comfortable to being correct. The use of fire to achieve certain land management objectives is still “new” and still requires a certain amount of intestinal fortitude on the part of the manager. It is true that the life systems with which we deal *are* complex, and we don't have all the answers—nor all the questions—but these should not be excuses for inertia and procrastination. Policy is written by mere mortals, and can be changed. The natural laws governing the operation of systems come from a higher authority. We cannot continue to short-change natural processes—including, but not exclusively fire—and expect to have quality land management. I am not proposing rebellion and

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manual burning. I *am* encouraging objectivity. If a method or procedure is biologically sound—good for the land, compatible with the inherent functioning of the system—it should not be rejected solely because it is not a part of formal policy. It's not the idea that needs changing or rejection, it's the policy.

### 2. FEAR OF NEGATIVE PUBLIC REACTION

Our agency has a program called "Inform and Involve." It is based on a sound philosophy, but I personally feel that it has gotten out of balance. In my opinion, we have *involved* our external publics about land management decisions far beyond the degree to which we have *informed* them of our management rationale. We have neither informed nor involved our internal public to the extent that we have our external publics. The public is not *informed* by one-shot public meetings, multicolored maps and multitudinous overlays, and two-page newspaper spreads. The public is informed by observing, talking with, and hearing from agency employees on the job. Informing the public starts with informing the people doing the work, and it is a continuing process. The land manager must regard *all* employees under his authority as his public. The understanding of and commitment to land management practices start with them. Do all employees know *why* they are doing what they are doing? In implementing land management decisions, we *have* to be way beyond giving orders—we need to be giving explanations and developing understanding. The more innovative the management direction, the more necessary the internal commitment and understanding. The urgency of this need applies at all levels of organization.

### 3. FIRE ECOLOGY IS A SPECIALTY

We might get very basic and question to what extent basic principles of *plain old ecology* are being applied in land management? To what extent is a lack of ecological understanding responsible for lack of initiative and fear of trying something different? How well equipped are we to explain the rationale of a land management decision, should one of our employees or one of our external publics

question it? As land managers we have some vague understanding that the functioning, behavior, and ultimate destiny of the systems we manage are governed by natural laws that affect the living and non-living components of those systems. We hopefully realize that as land managers we *cannot control* systems, but we *can direct* the change that is inherent to them. We must realize that the direction we give systems results in quality land management only if that direction is compatible with natural laws and processes. If fire is a natural process in a system, but for some reason or another we cannot use it, do we know enough about the operation of that system to determine an *ecological equivalent* of fire? Solutions to problems such as these do not lie in creating a work force of “90-day wonder” fire ecologists. They lie in a continuing effort of getting our entire work force thinking in terms of natural systems and the way they function—rather than in terms of functions and the ways in which man-made policy can be systematically applied to them. We have been embarrassingly remiss in seeing to the educational needs of our field personnel. As regards the concepts of ecology and how they apply to “everyday” land management, there are essentially no programs intermediate between nothing and a program of master’s degrees calibre. In summary, fire ecology is a specialty—a superstructure that belongs on a foundation of a working knowledge of basic ecological concepts and principles. Some of us aren’t ready for fire ecology. A knowledge gap is nothing to be ashamed of *provided* it is not used as an excuse for a cookbook approach to land management. Individuals at all levels engaged in the management of natural systems must themselves be as dynamic as those systems—and at times as resilient in compensating for deficiencies.