ABSTRACT: The traditional view of fire as a destructive agent requiring immediate suppression is giving way to the view that fire can and should be used to meet land management goals. Thus, fire control is being replaced by the more general concept of fire management, which is based on the need to integrate fire policy with land management objectives. The social, economic, and ecologic effects of fire must be evaluated in the selection of land management alternatives.

The activities of fire management organizations—fire prevention, control, and use of fire—must respond to needs of land management. Many agencies have developed fire organizations as separate entities that set their own objectives. The many land and resource managers who have recognized the need to incorporate fire considerations into land-use planning have so far lacked the techniques to do so.

As a natural process, fire has an important function in forest and range ecosystems. Fire can greatly influence the quantity and quality of resource outputs; it is a two-edged sword that can either harm or benefit our goals, depending upon the complex effects of fire and the nature of our wants.

The Fire in Multiple-Use Management Research, Development, and Applications (RD&A) Program was initiated by the U.S. Department of Agriculture, Forest Service, at the Northern Forest Fire Lab in Missoula to assist land managers. This profile explains what an RD&A program is; discusses its mission, goals, and approach to the problem; and tells why the approach involves federal laboratories, universities, and private research foundations.

Introduction

The traditional worldwide attitude toward wildland fire has been either to ignore the problem or to adopt a policy of total fire exclusion based on the idea that fire is bad because it is destructive. This is not to say that fire has never been used for beneficial purposes. On the local level, beneficial use of fire, for example, burning rangelands or game range, has often been employed without any scientific basis.

Whenever a fire policy has been developed, it has usually come in response to large fires that have damaged settlements or man's cultural improvements, often accompanied by loss of human life. Seldom has a fire control policy developed because of a concern for beneficial uses of fire or its ecologic role. However, as demands for resources and resource values rise, new fire policy strategies emerge. I suggest that fire policy originates as outlined in Table 1.

In North America, fire control efforts won support only after recurring disasters in the late 19th century. Two significant cases were the Peshtigo Fire in Wisconsin, where 1500 people died and over 600,000 ha burned in 1871, and the Hinkley Fire in Minnesota, where more than 400 people died in 1894. Yet it took until the turn of the century for effective support to develop and another 30 years for policy to crystallize and become effective in practice.

Even today, in spite of efficient and highly mobile fire control forces, the economic and environmental costs of wildfires are tremendous. In 1970, for example, a single California wildfire burned over 200,000 ha, killed 16 people, destroyed 722 houses, and cost some $250 million in direct suppression costs and structural losses.

There is no argument with the idea that protection is a logical first step needed to manage forest and rangelands. It is not surprising that the original support for strong, efficient fire control organizations came in the aftermath.
James E. Lotan

Table 1 How fire policy originates

<table>
<thead>
<tr>
<th>Phase of Resource Management</th>
<th>Official Fire Policy</th>
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<tr>
<td>Resources with low values or utilized to meet local demands only</td>
<td>Indifference</td>
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<tr>
<td>Developmental phase, resources are abundant</td>
<td>Concern, attempts at some fire control</td>
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<tr>
<td>Intensive management phase with emphasis on a few key resources, concern for scarcity</td>
<td>Emphasis on aggressive, initial attack with capabilities for handling large fires</td>
</tr>
<tr>
<td>Heavy demands for multiple and competing uses</td>
<td>Fire management, including concerns for ecological and economic implications</td>
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of catastrophic fires that caused large losses of property and human lives. However, as population pressures and affluence spread around the world, demands on renewable natural resources are becoming more critical.

Aggressive Fire Policy

These demands require more complex management strategies to meet the needs of society. As the 1970 losses in California illustrate, new strategies are needed even in strong, modern firefighting organizations.

First of all, there is the problem of managing fire protection forces. How might we cut costs of fire suppression? What are some logical strategies to use? Why should fires be suppressed and which ones might be permitted to burn, either for economic reasons or to effect benefits? Traditional policies have often simplified the decision-making process so that every fire is approached in the same way, enabling initial attack crews to proceed without delay.

In the USA in the early 1930s, the Forest Service used appraisals of forest value in determining the effort to be put into initial fire attack. But because it was difficult to cope with the fire load under severe drought conditions, the need for a strong, uniform fire control policy became clear. In 1935 the Chief of the Forest Service implemented what is commonly called the “10 A.M. Fire Suppression Policy.” This policy requires an aggressive stance. Sufficient forces are dispatched to bring a fire under control by 10 A.M. (1000 hours) on the following day. The intent of the policy was to simplify fire suppression decisions. Over the years such aggressive initial attack has become standard for many fire control forces elsewhere.

This official stance was not universally accepted, even within the agency. Noted fire researcher, Harry T. Gisborne, questioned it in 1942. He felt that it did not make sense to treat all areas alike—that is, to attack a fire in “goat rock” as vigorously as one in a white pine plantation.

Reasons for Change

Economics

Even assuming strong fire protection objectives, there are some compelling reasons for change. Current fire suppression costs are skyrocketing (Fig. 1). Presuppression forest fire-fighting expenditures by the U.S. Forest Service have increased approximately 10 times in 10 years. Can new strategies cut these rising costs? For example, would it be more cost effective to invest in a fuels management program designed to decrease hazard, or in new aircraft for dropping retardants? Would it not be more prudent to relinquish a goal of restricting the fire to 4 ha and, instead, accept 80 ha of fire damage and wait for an approaching cold front? Of course, implementing these changes requires improvements in our ability to predict fire behavior and its consequences. Fire control objectives should be established based upon sound land management objectives. The alternative is to establish five control objectives independently, without regard to why or what we are protecting.

Figure 1. Forest fire-fighting expenditures in the United States, 1965–1977.