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Planning the Fire Program for the Third Millennium[1]

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Abstract: The fire program planner faces an increasingly complex task as diverse--and often contradictory--messages about objectives and constraints are received from political, administrative, budgetary, and social processes. Our principal challenge as we move into the 21st century is not one of looking for flashier technology to include in the planned fire program. Rather, we must give major attention to the development of a better, more effective understanding by politicians, administrators, and the general public of the fire program alternatives available, their risks, and their real social, environmental, and economic costs and consequences over time.

Looking ahead to define the future of fire management 10 to 20 years hence in this country is a risky endeavor at best, as a look back at 80 or more years of history will confirm. The problem of forecasting the probable vector of current trends in both fire management capability and need is compounded significantly by a sort of schizophrenia that seems to dog the attitudes not only of some people in the fire organization but also of those in other administrative and legislative roles as well. This is the compulsion to seek a "state-of-the-art" status with technology on one hand while simultaneously clinging to the old, comfortable policies, objectives, and practices for fire protection in the wildlands.

Despite all the best upfront intentions, when the fire bell goes off there is still a tendency to revert to old ways: fire workload is measured and protection "need" based on what we have done, rather than on what we should be doing; good outcomes are presumed to have flowed from good decisions, and are seldom examined critically to see if they instead occurred in spite of bad ones; acres burned (often described as acres "destroyed") are used as a universal descriptor of the magnitude of fire problems; and the interest of the public, budget analysts. and legislators in funding fire programs awakens anew--albeit briefly.

Our first challenge for the future, therefore, is one of clearly identifying political and social expectations for the wildland fire program. And we need to be sure we are identifying real expectations, not labels and concepts which later will be found to have no substance. From these, organizational goals and objectives, both short and long term, must then be explicitly defined. Then--and only then--can the planner develop the appropriate array of alternatives and associated probable consequences from which the preferred course of action can be selected.

LESSONS FROM THE PAST

Since the inception of substantive formal wildland fire programs around the turn of the century, the development of policies and objectives for protection, and the subsequent planning of a program to meet those objectives, has gone through a number of rather distinctive phases. Pyne (1982), using the Forest Service as a model, identifies four major eras which span the time to the present, each with its own characteristic targeted fire problem and responsive policy and fire control emphasis.

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While there is, in fact, some uniqueness to each period, there are also commonalities that flow across time, commonalities that are important to an understanding of how best to consider and plan for the future.

A basic issue, which emerged early and with which we still struggle today, is that of the economics of fire protection. The establishment of the national forests led naturally to the recognition of the need to provide fire protection on those lands. The numerous major fires of 1910 quickly lent some substance to the economic implications of that protection decision. The decision that a systematic approach to fire protection was needed to deal with costly (from a suppression perspective) large fires raised an immediate issue of how much protection was enough. Headley's proposal in 1916 to use the concept of minimizing cost plus loss provided the apparent foundation for a rational planning approach. But application was another matter. First, realistic quantification of potential losses (or even actual ones, for that matter) was difficult at best. In situ tangible values therefore tended to become the principal determinant for setting protection priorities. Second, the mere presence of an organized protection force did not preclude larger, costly fires, especially in relatively lower value, lower priority areas. The result was an inability to plan an effective program that met the organizational objectives as they had been stated.

The lack of success that this economic-based approach had in planning the appropriate fire organization helped to bring about a fundamental change in fire protection force objectives in the 1930's. While the reduction of fire costs and losses remained a goal, its attainment was to be achieved through a more direct objective: control all fires promptly while small. Both the high suppression costs and resource losses attendant to large fires would thus be precluded. Fire planning could readily address this objective and identify with reasonable confidence the kind and amount of the fire protection organization that could be expected to achieve it.

The problem with this planning objective was the lack of any attention to the cost component. Not a significant factor in the inexpensive manpower era of the CCC, costs escalated dramatically with rising personnel costs and the introduction of various expensive technologies beginning in the fifties. By the seventies, the process, in retrospect, was virtually out of control. The Forest Service 1972 fire planning project (which was based on the 10 am control/l0 acre size standard) identified a needed fire organization with an annual budget of some $235 million. This was more than four times the then current presuppression funding of $53 million. By 1977, the presuppression budget had risen to $143 million as implementation of the 1972 plan proceeded (Gale 1977).

That this rise in budgeted funds was not accompanied by any identifiably significant increase in program effectiveness, or by a corresponding decrease in emergency fire suppression expenditures, was noted by both Forest Service management and the Congressional appropriation committees (USDA Forest Service 1980). Two actions significant to the direction of current and future fire program planning resulted. First, the Forest Service undertook the development of a fire management policy that tied fire protection objectives to planned resource management direction and expected fire consequences, rather than to an arbitrary universal time and size control standard (USDA Forest Service 1977). Second, the Congress, faced with rising deficits and looking more closely at agency expenditures that produced no tangible or social outputs, directed the Forest Service to conduct a cost-benefit analysis of both presuppression and suppression activities, and to use that analysis to develop and support future fire program budget submissions (USDA Forest Service 1980).

The outcome of these efforts was the reintroduction of an economic efficiency criterion into the fire program planning process. National policy now required that fire program development and execution to be based on minimizing the sum of costs plus the net change in resource values due to fire, consistent with planned land and resource management objectives (USDA Forest Service 1983). Planned fire presuppression and suppression actions in terms of kind, amount, and timing could now be conformed to expected outcomes based on costs and benefits for individual local situations. For the legislator and the agency manager, the process also at last provided a reasonably objective measure of the probable physical and economic consequences of protection program alternatives, information which heretofore was unavailable at least on a macro scale.

An obvious concern is how the current version of the "cost plus loss" concept differs from that applied unsuccessfully in the 1920's.

While quantifying the economic impacts of fire on some resources is still something less than an exact science, agencies at least now have some rational approaches available. For example, values developed for the Resources Planning Act (RPA) process provide consistency among planning units when estimates must be used in lieu of market data. -Planners also now have a validated analytical tool in the National Fire Management Analysis System (NFMAS). While having definite limitations, the process does provide an effective means to systematically integrate resource values, resource outputs, fire effects, probable fire activity, and fire program alternatives to produce and display planning unit-specific information (as well as regional and national program aggregations) on the expected economic and other consequences of each alternative (USDA Forest Service 1980).

This change from fixed protection standards that mandated prompt control of all wildfires has not been limited to the Forest Service. The other federal wildland management agencies as well as a number of states also have moved toward consideration of economic efficiency information in the protection decision process.

Economics, of course, are not the only reason for these shifts away from planning to rigid suppression standards. When resource management objectives are considered in the development of fire management objectives, the resource benefits from fire can provide an equal if not greater inducement for permitting flexibility in suppression action under appropriate circumstances.

LOOKING AHEAD TO 2000

Recognizing that the past is prologue, we turn now to some thoughts on what the future may hold in the way of wildland fire program requirements, and their implications for program planning. Given current trends, there are a number of significant changes taking place that are going to materially affect the wildland fire management program. Some of those with more direct consequences are:

--increased population
--increased average age
--increased leisure time
--increased mobility

These will contribute to substantial increases in demand on wildland resources. For example, the Resources Planning Act assessment for the National Forests expects over the next 50 years the need for a 50 percent increase in timber production, a 200 percent increase in water yield, and foresees a greater than 60 percent increase in recreation use (USDA Forest Service 1986). Air quality concerns--and associated pressures for severe restrictions on activities that precipitate them--will multiply.

While the rate of migration from urban to suburban and rural areas has slowed in recent years, the spread of dwellings into the fringes of the wildland environment will continue to be significant.

At the same time, these same population changes are going to be generating an increasing demand--if not requirement--for a variety of publicly financed social programs and services at federal, state, and local levels.

The implications of these changes to planning fire programs are obvious: we are going to simultaneously face increases in wildfire occurrence; increases in the adverse consequences of wildfire (and thus increased pressure to provide more effective fire protection); decreased capability to use fire as a management tool; and significant competition from a wide range of high priority, nonfire programs for increasingly constrained budget dollars--all at a time when the cost of personal services is also going to be an increasing problem. Successfully meeting this challenge is going to require creativity, and a willingness and ability to change some old ways.

Already the days are about over when fire protection agencies can invoke the specter of impending wildland holocaust as justification for budget requests. Congress stopped buying that somewhat tired line almost 10 years ago, and States would seem for the most part to be similarly inclined. Fire services are going to have to do a better job first in competing for the budget dollars, and second, in using the dollars they do get. Lets explore some ways to accomplish this.

When faced with the need to look for opportunities to improve program effectiveness, there is a tendency to look first to new technology for solutions. In the main, we are eternal optimists. If today man can go to the stars, surely next month, next year, or next decade we should be able to capture that

technology for application to our problem. Newer is better, and keeping pace with the state-of-the-art is a necessity. Now technical progress is certainly essential for effective wildland fire protection. But history would urge some cautions be observed in program selection and application.

First, operationally effective technical advances come about significantly slower than they are expected and planned for. One therefore has to exercise some caution about depending too much on some potential future break-through to solve a current problem.

Second, the mere availability of operational state-of-art technology in no way assures either its efficient or its effective application. The inertia inherent in any organization (and the wildland fire services, with all due respect, are more noted for their reactionary than their revolutionary attributes) tends to operate against the timely, fully effective introduction and use of new ideas. Near term expectations usually become longer term realities.

Third, what is efficient in one application may become an economic albatross if not carefully managed. The airtanker program over the past 25 years is an example. Originally consisting of relatively inexpensive to operate surplus World War II aircraft that delivered loads modest both in size and cost, the fleet and its manner of use underwent an almost insidious metamorphosis. The number of planes grew, and soon larger, expensive aircraft that carried retardant costing several thousand dollars a load became the rule. If some retardant was good, lots apparently was better. As a result, the airtanker program became a major contributor to sharply increased fire suppression costs by the 1970's, and one had to wonder what kind of return we were getting for our money. Analysis of costs and benefits finally provided some needed direction, and in recent years that program has seen significant revision. There may well be other tools showing up in our fire management bag of tricks that. while making good press, may demonstrate similar tendencies. Be on guard not to be seduced by the glitter of their state-of-art technology.

My point is that, while important, technology alone is not the answer to the problems either of today or of the future.

I think there are two major keys to future success, both of which are essential. Both are going to require some changes in attitudes and capabilities of many of today's managers. The first is an increased use of analytical techniques to evaluate programs and technology both before they are implemented, and for monitoring their performance. And these analytical techniques must include an evaluation of the economics, both costs and benefits, of any proposal. Like it or not, economics is the common denominator by which uncommon programs can and will be compared in the political arena. While having a proper economic analysis will not guarantee adequate funding, failing to do one will definitely increase the probability of inadequate funding (MacCleery 1983).

Economic analysis also develops information necessary for setting priorities and making program decisions internally. It provides an indication of the potential costs of meeting protection requirements generated by social or environmental issues, information which can be of major significance in the decision process. A joint analysis in an area where two or more agencies share protection responsibilities will both identify the best protection program for the area as a whole, and provide a rational basis for the equitable sharing of costs. Important today, economic efficiency and cost-benefit data will be essential in the future to identify the appropriate kind and amount of forces and activities for the property and resource values protected, and the consequences of alternative budgets and programs.

Unfortunately, some managers today cannot or will not use analysis, especially economic analysis, in the planning and decision processes. They view the outputs either as inappropriate for evaluating wildland fire protection options, or as potentially threatening to their prerogative to make decisions. Neither view is valid.

Analyses--economic or otherwise--do not make decisions. Rather, they develop consistent, objective information by which alternatives can be evaluated and compared. It is left to the decisionmaker to consider the merits of this information relative to other pertinent factors, and to select the alternative that best fits all the decision criteria.

Some would argue that economic efficiency is not an appropriate factor in planning their agency's protection programs since there is either a legislated mandate to provide equal protection for all lands within their

jurisdiction, or that the use of dollar values is not appropriate for the resources they protect. Since none of these agencies is currently provided an unlimited budget, nor do they have protection forces distributed completely and uniformly over their area, someone obviously must be considering the economic costs and benefits of protection along with social, environmental, and political issues. Priorities for past dollar expenditures obviously have been established based on perceptions of fire program costs and benefits. And they will obviously continue to be based on these perceptions--be they right or wrong--until they can be replaced with relevant factual data.

We need to give high priority to developing a better understanding, both by all levels of management and by legislators, of the meaning and use of analytical data in the program planning and budgeting process. We also need to move ahead with the development of better analytical capabilities so that our tools keep pace in the future with ability to use better information. The technology of modelling and expert systems offers some excellent opportunities if--and I stress if--we manage its application.

Finally--and most importantly--even the best analysis and the best technology must have some framework if they are to be properly used. This framework must consist of well-defined, rational organizational goals and objectives against which the potential utility of a program or a tool can be measured before it is selected for implementation. Strategic program expectations must be understood before individual solutions to tactical problems are developed. A new, more costly detection system which successfully meets an immediate objective of locating fires more quickly to reduce burned acreage may well fail a higher order test which mandates a look at marginal changes in overall program cost plus loss.

The varied "best" strategies that have been applied with varied success to wildland fire protection in this country since 1900 have resulted as much from differing perceptions of the problems and their causes as from the differing ideas about the criteria upon which protection should be based. While certainly still far from being all-wise, protection agencies today have the advantage of both historical experience and increased knowledge, and the capability to process the aggregate information these provide. Given the complexities of the current and expected future fire management environment, the need for clear direction is fundamental for any valid planning to ensue. The keystone of this direction is carefully thought out, well-defined fire management program objectives which reflect and integrate the realities of social, environmental, political, and economic requirements and constraints. Management that is able to provide this direction in the future will succeed. The time to start building the capabilities to do this is now

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