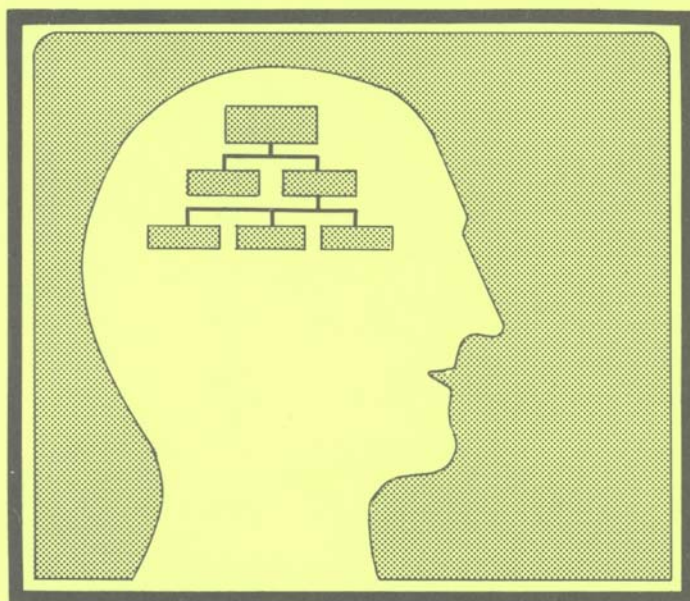


PACIFIC SOUTHWEST Forest and Range Experiment Station

FOREST SERVICE
U. S. DEPARTMENT OF AGRICULTURE
P.O. BOX 245, BERKELEY, CALIFORNIA 94701



ORGANIZATIONAL FACTORS IN FIRE PREVENTION: roles, obstacles, and recommendations

John R. Christiansen

William S. Folkman

W. Keith Warner

Michael L. Woolcott

CONTENTS

| | <i>Page</i> |
|---|-------------|
| Summary | 1 |
| Introduction | 3 |
| Procedure | 3 |
| Results | 4 |
| Limitations | 4 |
| Role Congruence | 4 |
| Social and Organizational Obstacles | 9 |
| Proposals for Improvement | 9 |
| Recommendations | 11 |
| Literature Cited..... | 13 |

— The Authors —

JOHN R. CHRISTIANSEN is Professor of Sociology, Brigham Young University, Provo, Utah, Department of Sociology. He earned bachelor's (1949) and master's (1952) degrees at Utah State University, and a doctorate (1955) in sociology at the University of Wisconsin. **WILLIAM S. FOLKMAN** is a research sociologist with the Station's Wildfire Prevention Research Unit, headquartered in Berkeley, Calif. He holds a bachelor's degree (1940) in agriculture from Utah State Agricultural College, a master's degree in sociology (1949) from the University of Utah, and a doctorate in rural sociology (1952) from Cornell University. **W. KEITH WARNER** is also Professor of Sociology, Brigham Young University. He holds bachelor's (1954) and master's degrees (1959) from Utah State University, and a doctorate (1960) in rural sociology from Cornell University. **MICHAEL I. WOOLCOTT** is a sociology graduate of the University of Colorado (bachelor's degree, 1969) and Colorado State University (master's degree, 1972), and is currently a graduate assistant at Brigham Young University.

SUMMARY .

Christiansen, John R., William S. Folkman, W. Keith Warner, and Michael L. Woolcott.

1976. **Organizational factors in fire prevention: roles, obstacles, and recommendations.** USDA Forest Serv. Res. Paper PSW-116, 13 p., illus. Pacific Southwest Forest and Range Exp. Stn., Berkeley, Calif.

Oxford: 432.1(792):903

Retrieval Terms: fire prevention; program evaluation; personnel development; role congruence; organizational obstacles.

Personnel on three National Forests of the U.S. Forest Service's Intermountain Region were interviewed to determine incongruities between their perceived and actual roles in fire prevention.

The three forests were the Fish Lake, Uinta, and Wasatch. In general, a "moderate" degree of congruence was found between proportion of time spent on fire prevention activities and the importance assigned to those activities by the respondents. Field personnel assigned the greatest importance to fire prevention duties, while personnel from the Forest Supervisor's office assigned the least importance to such duties. Respondents from District headquarters were intermediate in the importance they assigned to fire prevention duties in relation to their other tasks. Little congruence was found between time spent on fire prevention and being rewarded with advancement by the organization. District field personnel were most inclined to believe that fire prevention success contributes to advancement, while the Forest level personnel reported such success bore little relationship to advancement.

Three-fourths of the respondents said most of their job know-how came from day-to-day experience; few reported job training sessions or formal training. This situation suggests that the Forest Service regards fire prevention as relatively low level, nontechnical work which, in the main, can be picked up on the job.

The criteria by which fire prevention success is judged was found to be confused. Respondents' reports of how their success was judged frequently differed from their supervisors' reports of how they judged success.

Obstacles to effective fire prevention work were lack of time and manpower (56 percent), lack of money for operational expenses (41 percent), problems in law enforcement (36 percent), and not enough training in latest techniques and programs (30 percent). Lack of money was most apparent to

Forest Supervisors' office and District headquarters respondents, while District field personnel felt most keenly problems in law enforcement. District headquarters personnel were most aware of training needs.

The findings from the analysis of interviews with respondents were reported back to them in meetings on the Forests. The response was quite unanimous that the analysis fairly interpreted their feelings. Suggestions were solicited as to how best to resolve the problems revealed.

In addition to more money, suggestions for improvement included more training, more emphasis on fire prevention at higher levels of the organization, and more news media coverage.

The types of information needed to make fire prevention more successful centered about more effective evaluation procedures for fire prevention programs in general and for specific prevention techniques or activities. Other suggested needs include improved transmission of new fire prevention ideas, sources of money for fire prevention, and knowledge about the greatest fire risks.

On the basis of this study the following recommendations for improving fire prevention performance are offered:

1. Develop better methods of determining the degree of success in fire prevention efforts.
2. Improve methods for enabling personnel to achieve greater advancement in the Forest Service organization through successful fire prevention work.
3. Develop fire prevention technology further—especially the social technology.
4. Provide more or better training, or both, for personnel who have fire prevention responsibilities.
5. Place and sustain greater emphasis on fire prevention work at all levels of the Forest Service organization.

In many organizations, including the U.S. Forest Service, some of the most relevant information about how well the work is going, problems being encountered, and potentially helpful changes is available from individuals directly involved in the functioning of the organization. Many people having responsibility for various aspects of the work have just such information, but, for various reasons, it fails to be conveyed to the decisionmakers.

This paper reports a study of three factors related to fire prevention: role congruency in fire prevention activities, social and organizational obstacles, and how fire prevention performance might be improved. Interviews, written questionnaires, and "feedback" techniques were used to obtain responses from persons working directly in fire prevention on three National Forests in Utah.

In this report, the terms "role" and "role congruence" are used as shorthand expressions for

technical sociological concepts or ideas. Simply stated, "role" refers to the tasks performed by a person; "role congruence," to the degree of correspondence between the two elements of role, for example, between what the person thinks he should do ideally and what he actually does

This focus on roles and other organizational matters differs from many previous fire prevention studies which concentrated on the forest users. In such previous studies, the concern was with the public who used the forests: who they were, what kinds of activities they engaged in, what kinds of activities result in man-caused fires, and the like (Brown and Davis 1973). In this exploration, as in a few others, the focus is on another side of fire prevention problems: the people in the Forest Service itself and the organizational situations within which they work (Sarapata and Folkman 1970).

PROCEDURE

Employees from various parts of the U.S. Forest Service's Intermountain Region who had responsibilities for fire prevention were contacted in formulating the study problem, developing the research approach, and gathering data.

In an attempt to broaden the base of the study and make generalizations somewhat more possible, a multimethod, multiphase approach was utilized. In delineating the study problem and selecting suitable research techniques, nonstructured interviews were conducted with persons from the Intermountain Regional Office, and from the Intermountain Forest and Range Experiment Station. These initial interviews proved to be most useful in facilitating the construction and pretesting for the general interview schedule. Further discussion and pretesting was done with personnel from the Toiyabe and Manti-LaSal National Forests.

After the initial interviews, data for the study itself were obtained from 63 persons having fire prevention responsibilities on the Fish Lake, Uinta, and Wasatch National Forests during June and July 1974. This group represents all persons having

such responsibilities at the Forest and District headquarters level and a sample of District field personnel. The generalizations made in this present report are primarily based on the data collected in these interviews. The respondents were classified for study purposes into three groups, depending on their fire prevention role:

| <i>Group</i> | <i>Number</i> | <i>Composition</i> |
|-----------------------|---------------|---------------------------------------|
| | (n=63) | |
| Forest | 8 | Supervisor, staff officer |
| District headquarters | 27 | District ranger, fire control officer |
| District (field) | 28 | Fire patrolman, seasonal employee |

In addition to the interviews, questionnaire and "feedback" sessions elicited further information from respondents. These sessions were held on the Manti-LaSal, Fish Lake, Uinta, and Wasatch National Forests, and were used to help interpret the meaning and implications of the interviews.

RESULTS

Limitations

The number of respondents is large enough and sufficiently representative to provide useful information about role and other organizational issues relating to fire prevention work on the Fish Lake, Uinta, and Wasatch National Forests. It is not large enough in numbers or scope, however, to represent the entire region, much less other forests or regions in the country. But the responses from Forest Service respondents who are familiar with the situations on other forests suggest that the conclusions probably do have wider generality.

Another limitation concerns the method of defining the abstract concept "role congruency" in terms of simple, observable behavior (*table 1*). This method assumes that for complete congruency most time will be spent on activities which are ranked as being most important. It is possible that some tasks ranked "important" might require less time than others to be completed satisfactorily. Consequently, the expectation of achieving a linear-type relationship between time spent on tasks and the importance of these tasks for fire prevention might be unrealistic.

It is possible that other limitations exist in the study which may affect the validity of the generalization. However, if any exist which would modify the conclusions to an appreciable degree, they remain unrecognized.

Role Congruence

How well is the fire prevention program working? Does the Forest Service, as one of many organizations responsible for fire management, give primary emphasis to fire prevention? One way to examine that question is to inquire how the personnel are carrying out their expected assignments. In this study, the approach centered on the idea of congruence: Is there a congruence or correspondence between what the people think they ought to be doing and what they are actually doing? And are these assigned responsibilities compatible with the organizational context within which they are to be performed?

Congruence Between Perceived Effectiveness of Fire Prevention Duties, and Time Spent— Fire prevention duties and the perceptions of the relative effectiveness of those duties by Forest Service personnel were ranked in 12 categories (*table 1*). Most respondents indicated that contacting people who used the National Forests in patrol areas was the most effective means that the Forest Service employees could use to prevent fires. Conversely, routine activities were considered to be least effective. The fire prevention duties having the four highest rankings all involve personal contacts with people.

Responses concerning the proportion of the time spent during May through October 1973 on each of

Table 1—Averaged rankings of fire prevention duties concerning perceived effectiveness in preventing fires, and time spent on each¹

| Fire Prevention Duties | Rank of perceived effectiveness in Fire Prevention ² | Rank of time spent on each duty ³ |
|---------------------------------------|---|--|
| User contacts--contact areas | 1 | 1 |
| User contacts-- campgrounds | 2 | 2 |
| Public contacts -- organizations | 3 | 7 |
| Public contact-homes | 4 | 4 |
| Implementing prevention plan | 5 | 3 |
| Supervising prevention program | 6 | 5 |
| Training fire prevention crews | 7 | 8 |
| Purchasing and maintaining equipment | 8 | 10 |
| Writing fire prevention plan | 9 | 6 |
| Enforcing laws | 10 | 12 |
| Maintaining signs and posters | 11 | 9 |
| Contacting mass media representatives | 12 | 11 |

¹"1" has the highest ranking and "12" has the lowest ranking.

²Rank based on percentage of respondents who ranked the duty "1".

³Rank based on average percentage of time spent on each duty.

Spearman Rank-Order Correlation Coefficient (Rho) = .85.

the fire prevention duties in which respondents had been involved were ranked (*table 1*). One measure of role congruency is the ranking of perceived effectiveness of their tasks, and time spent. The rankings show considerable congruence.

The two duties rated most effective in preventing fires—contacting users in patrol areas and campgrounds—are likewise those on which most fire prevention time is spent. However, contact with the public through organizations such as civic clubs, schools, churches, and scout troops—rated as third most effective in prevention—ranks seventh in the amount of time spent on it. Many respondents mentioned that they would like to have more time to spend in such contacts. One other activity—writing a fire prevention plan—appeared to be relatively incongruent. That is, more time seems to be spent on it than its effectiveness in preventing fires would justify.

We also explored the amount of congruence by computing gamma measures of association between perceived effectiveness and time spent. This was done separately for each of the three groups: Forest, District staff, and District field. The results showed a general pattern of moderate congruence, though with some exceptions. In this analysis, the greatest congruence appeared to be in the duties connected with supervising the program, contacting users in campgrounds, and purchase and maintenance of equipment.

Congruence Between Time Spent on Fire Prevention, and Importance of Fire Prevention—A second way to examine role congruence is to explore the relationship between the proportion of a person's total time spent on fire prevention duties, and the importance he attaches to those duties as compared with his other responsibilities.

We found a "moderate" degree of congruence (Cramer's V = 0.41) (Loether and McTavish 1974) between the proportion of total time spent on fire prevention activities and the importance assigned to those activities as compared with all other duties listed by each person (*table 2*).

This relationship held for each separate group: Forest, District headquarters, and District field staff.

More detailed analysis of this relationship shows, however, that the greatest proportion of time spent on fire prevention tends to be among those in the District field group, with less time spent on fire prevention among the personnel in the District headquarters group, and least among those in the Forest group. Persons in the Forest group less often

regard fire prevention work as more important than their other assigned duties, whereas, the personnel in the District headquarters group stand between the Forest group and the District field group in the importance they assign to fire prevention duties in relation to their other tasks. These findings, coupled with a finding (to be detailed later in this report) that Forest Service employees at all levels have considerable autonomy in their priorities and expenditures, suggest that fire prevention efforts may indeed be *relatively* unimportant to the Forest Service generally.

Congruence Between Time Spent and Organizational Advancement—A different kind of congruence is that which concerns the correspondence between role performance and being rewarded by the organization. If the organization, in fact, views particular programs and tasks as important, it almost certainly will reward in their careers those individuals who successfully work on those programs and tasks. Moreover, individuals will be inclined to spend their time on work which is important, and hence rewarded.

Respondents were asked to indicate just how much they think advancement in the Forest Service depended upon success in fire prevention activities. Over-all, fire prevention work was rated by relatively few respondents as being important for their advancement. One-third of the respondents gave it the two lowest marks on a six-point scale. Two-thirds of all respondents gave it a "low" rating for advancement opportunities (*fig. 1*). When responses of the three groups are compared, it is evident that the Forest group believes that their advancement is least dependent upon fire prevention success. The District field group is relatively high in its belief that fire prevention success contributes to advancement, whereas, the District head-

Table 2—Distribution of respondents according to perceptions of the importance of fire prevention, and time that they spent on fire prevention

| Importance of fire prevention | Percent of time spent on fire prevention | | | |
|-------------------------------|--|-------|-----|--------------------|
| | 0-20 | 21-40 | 41+ | total ¹ |
| "Very Important" | 3 | 5 | 9 | 17 |
| "Moderately Important" | 16 | 5 | 1 | 22 |
| "Unimportant" | 20 | 1 | 0 | 21 |
| Total | 39 | 11 | 10 | 60 |

Chi-square = 19.9; d.f. = 4; p = .001; Cramer's V = 0.41.

¹Excludes three "No responses."

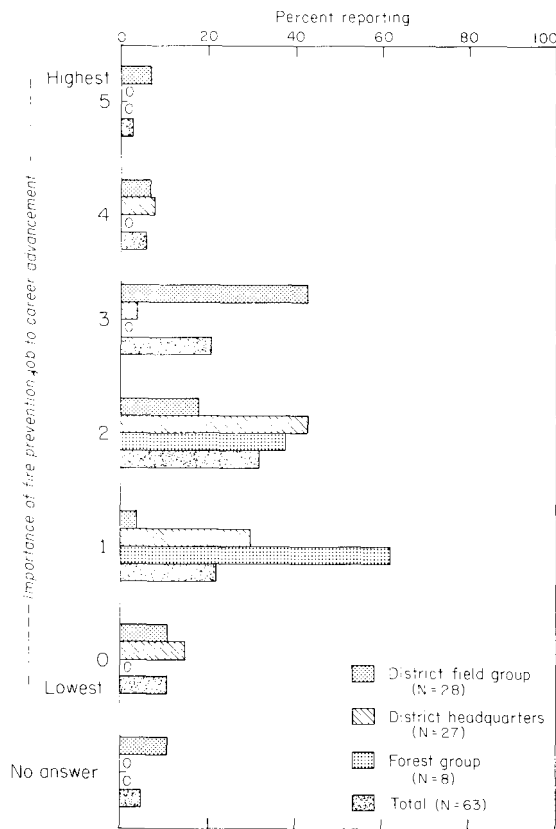


Figure 1—Quality of one's fire prevention work is seen as having little bearing on career advancement.

quarters group's responses tend to be between those of the other groups.

There is a low to moderate relationship (Cramer's $V = 0.39$) between the amount of time respondents report spending on fire prevention, and the importance they think this kind of work has for advancement (table 3). Those respondents who rated fire prevention activities "high" tended to spend relatively more of their time on such activities. This tendency is not strong, however. It is obvious, therefore, that substantial congruence is lacking between perceived importance of success in fire prevention on advancement, and proportion of time spent on such activities. This lack of congruence probably results from three major conditions: (a) fire prevention success is not highly valued—despite rhetoric to the contrary; (b) demands for fire suppression success are so great that fire prevention activities are restricted; and (c) lack of adequate measures of fire prevention activities are restricted; and (c) lack of adequate measures of fire prevention success is such that despite moderate values being placed upon prevention, activities

connected with it are not rewarded because they have not been demonstrated to be effective.

Factors Determining Advancement in the Forest Service—Having replied that success in fire prevention activities was not strongly related to advancement in the Forest Service, respondents were then asked to indicate what factors were important for advancement.

Ability was mentioned by 82 percent of all respondents as being most important for advancement (fig. 2). Knowledge (68 percent) and recognition in the field (58 percent) were also mentioned by a majority of the respondents. Somewhat fewer persons (48 percent) responded that the performance rating profile was important whereas 47 percent said the number of job openings, 33 percent—friends and personal relations, and 28 percent—seniority. Being from a Forest Service family and the ability to work with others were mentioned by 13 and 6 percent, respectively.

Comparing responses of the three groups shows some differences in responses. Forest group responses emphasized knowledge in advancement. However, the District headquarters group's responses focused on ability. The District field group considered ability and knowledge as most important in advancement, but placed considerable importance on recognition in the field and on the Performance Rating Profile as well.

When these factors for advancement are compared with the ratings of the importance fire prevention success has on advancement it is possible to gain some additional insight about what seems to count for organizational advancement. It appears that if recognition in the field is ranked high in importance, there is somewhat less tendency to think fire prevention success counts heavily. The same general tendency appears for those who cite

Table 3—Distribution of respondents according to ratings of the extent that advancement depends on success in fire prevention activities, and time spent on fire prevention

| Rating of extent that advancement depends upon fire prevention success | Percent of time spent on fire prevention | | | | |
|--|--|-------|-------|-----|--------------------|
| | 0-9 | 10-19 | 20-29 | 30+ | total ¹ |
| High (4-5) | 0 | 3 | 0 | 3 | 6 |
| Medium (2-3) | 8 | 6 | 11 | 6 | 31 |
| Low (0-1) | 10 | 6 | 0 | 5 | 21 |
| Total | 18 | 15 | 11 | 14 | 58 |

Chi-square = 17.4; d.f. = 6; $p = .01$; Cramer's $V = 0.39$.
¹Excludes five "No responses."

friends or personal relations as important bases for advancement.

On the other hand, those who rated both knowledge and seniority as important also tended, a little more often, to assign some importance to fire prevention success as helpful for advancement.

By considering the foregoing, it is helpful to note that considerable differences exist among the three groups studied when they were asked specifically about the importance of fire prevention activities relative to advancement. The farther respondents were removed from the field, the less importance they placed on fire prevention.

This finding suggests that advancement and rewards for effective fire prevention activities diminish as persons rise on the Forest Service career ladder. It also suggests reasons why attention to fire prevention practices, policies, and measurements appear to be lacking relative to other Forest Service activities. First, the people in positions most capable of changing fire prevention procedures and emphasis are least inclined to do so. Second, most talented and able persons in the Forest Service tended to achieve high positions through outstanding performance in activities other than fire prevention.

Development of Technology and Roles—One consideration that may underlie the effective performance of fire prevention roles, and the success of fire prevention programs, is the extent to which the technology of fire prevention work is developed and reflected in the duties assigned personnel. For instance, if the technology is highly developed, routinized, and standardized, then finding the same specific duties assigned to the same roles everywhere could be expected. Thus, details on what tasks were to be done and when each was to be done would be specified.

To inquire about this, respondents were asked a very general question about the freedom they had in deciding (a) what they do and (b) when they do the specific parts of their work. In each case, two-thirds reported "great freedom." A comparison of responses among groups revealed that District staff personnel had somewhat more freedom in decisions than those in the other groups, but generally the responses were similar.

A second indicator of the development, standardization, and specification of roles is the total number of duties into which a person's fire prevention responsibilities are divided. Simply counting the number of those duties shows a wide variation in the number of duties reported. About one-third

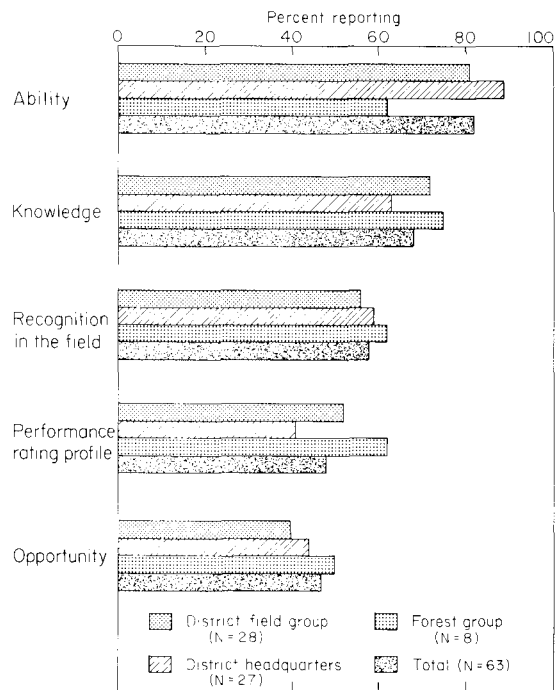


Figure 2—Recognized ability and knowledge are seen as most important for advancement of field personnel, knowledge and opportunity for Forest level personnel.

of all respondents had one or two fire prevention duties. Another third had three duties, and the rest had five or six fire prevention duties.

A third indicator is how people learn their fire prevention job. Do they learn it in the course of day-to-day experience, in some kind of job training sessions, in formal schooling, or in some other way? Three-fourths of the respondents said their greatest job know-how came from day-to-day experience. Another 13 percent reported some combination of on-the-job experience, formal training in school, or training sessions (*fig. 3*).

A comparison of responses among the groups showed the two District groups to be quite similar. In both of these groups, most respondents stated that they learned most about their jobs from day-to-day experiences. The Forest group were evenly divided in their emphasis on day-to-day experience learning, and combinations of learning sources.

This suggests that the Forest Service does not regard fire prevention work as so technical that much more than job experience is necessary to learn it; or possibly that a person learns things in other training that is applicable to fire prevention.

How Fire Prevention Success is Judged— Related to the development of technology and roles,

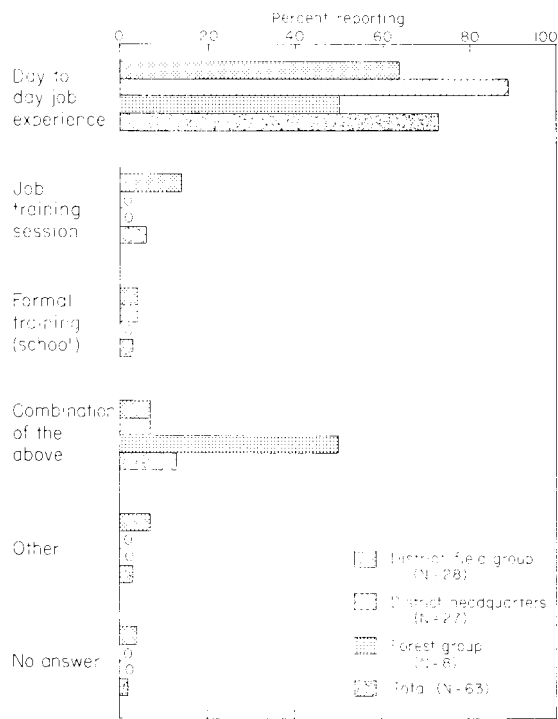


Figure 3—Day to day job experience is the most frequently reported way personnel learn their fire prevention duties.

and to perceived bases for advancement in the organization, is the important issue of how fire prevention success is judged. It appears that the criteria and methods for judging success are not yet sufficiently developed. As a consequence, it is difficult for either the organization or the individual to judge the success of an individual's efforts or even those of the organizational program.

Forest level personnel were asked, "How do people in the Regional Office judge the degree of success your Forest has in fire prevention work?" Then they were asked, "How do people in the Forest Supervisor's office judge the degree of success of each District?" Similarly, district rangers and fire control officers were asked how the Forest people judged success and how they, themselves, assessed the success of their fire prevention people in the District. Finally, the other personnel in the District were asked, "How does your supervisor judge the degree of success you have in your fire prevention work?"

All but one of the eight forest-level respondents indicated that the "number of man-caused fires" was the principal criterion used by regional personnel in judging fire prevention success. On the other hand, they indicated they used two criteria in

judging the fire prevention success of districts on their forests. These two criteria were: (1) number of man-caused fires occurring in the district, and (2) reduction in the number of fires relative to previous years. The first criterion for judging the fire prevention success of districts was used by five of the eight forest-level respondents, and the second criterion was used by four forest-level respondents.

Nearly two-thirds (63 percent) of the District headquarters respondents maintained that the "number of man-caused fires" was a criterion used by Forest level personnel to judge their district's fire prevention success. As seen above, this is the criterion Forest level personnel say they use. However, two other criteria appeared to be incorrectly considered by some District headquarters respondents to be used by forest level personnel in judging fire prevention success. The first of these criteria, "making and carrying out fire prevention plans," was mentioned by 22 percent of District headquarters respondents; and 19 percent of them mentioned "public relations." "Public relations" includes those activities in which members of groups or institutions are contacted to promote fire prevention. For example, contacts with Boy Scout groups, civic clubs, and schools would be included, together with efforts made with the news media on a local level. Additionally, about two-fifths of District headquarters respondents revealed that they are uncertain about criteria used by forest personnel to judge their district's fire prevention success.

In responding to the question of how they judge fire prevention success in their district, District headquarters personnel gave answers which were categorized into several criteria. The two criteria used by the largest percentage of respondents were: (1) Number of man-caused fires, and (2) public relations activities, both of which were mentioned by 44 percent of these respondents. Other criteria mentioned included: completing assigned duties (33 percent), analysis of reports and inspections (21 percent), area conditions, control (15 percent), and reduction in fires (15 percent).

District field respondents' perception of the criteria by which their fire prevention success was judged were more congruent with criteria reported being used by their supervisors than was that of District headquarters respondents with their supervisors. Again, the two criteria mentioned by most respondents were: number of man-caused fires and public relations activities, both reported by 39 percent of the respondents. Other criteria mentioned were: completing assigned duties (25 per-

cent), analysis of reports and inspections (21 percent), and number and quality of personal contacts (21 percent). Eighteen percent of the District Field respondents reported that they were uncertain how their success was judged.

The responses generally indicate some incongruity in the criteria and their implementation. The number of man-caused fires is the most frequently mentioned criterion of success, but even that criterion is not mentioned by most respondents. It is evident that people assigned to fire prevention do not clearly understand how their success is judged by their supervisors, and that their supervisors have difficulty in making such judgments.

This lack of clear criteria for judging fire prevention success has a number of important implications. First, the possibility exists that an individual might perform his role well and not get much credit for it because of the difficulty in knowing what "good performance" is. Second, a person may not do his job well, but could receive credit for success. This situation could diminish the status of prevention programs or the emphasis given them at various levels of the organization.

Social and Organizational Obstacles

The second major objective of this study was to explore some of the social and organizational problems or obstacles to fire prevention work. What things may be hindering this program?

To answer this question, respondents were asked to assign a rank order of importance to a list of possible problems. They were then asked to add any other problems to the list that they thought ought to be included and rank the importance of any such additions.

Just over half (56 percent) of all respondents at all organizational levels studied gave their first or second place rankings to problems of lack of time and manpower. Two-fifths (41 percent) cited lack of money for operational expenses as most important (ranked first or second), and nearly the same proportion (36 percent) gave the first and second ranks to problems of law enforcement. Nearly a third (30 percent) gave high ranking to problems of "not enough training in the latest techniques and programs" (*fig. 4*).

The two problems ranked as most important by the largest proportion of all respondents may be translated directly into money. Time, manpower, and operating expenses all have the common de-

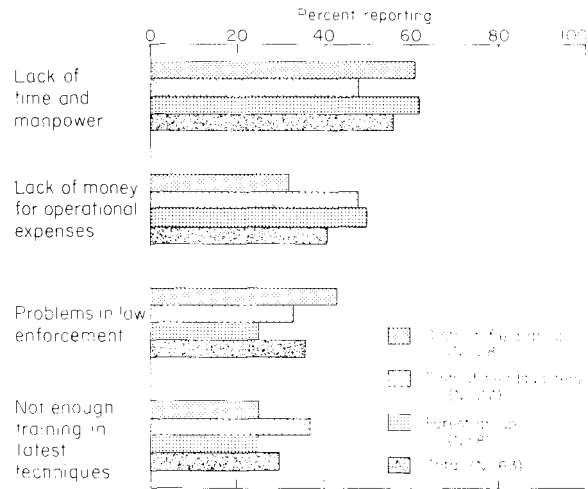


Figure 4—There is considerable agreement that money-related factors are the major hindrances to effective fire prevention work.

nominator of funds available for them. But it appears likely that important problems would not be automatically taken care of by increased funding. Funds are a perennial problem, but getting more funds is not always a panacea. Thus, problems of law enforcement and of getting "more training in the latest programs and techniques" (mentioned quite frequently by the two district groups) are not matters of budget allocation only. When this information is put together with other data on the lack of fire prevention technology, it gives some basis for possible improvements.

Providing more money for manpower, time, and operating expenses can help. But the questions remain: What is the effect of law enforcement on number of fire starts? What are the most effective methods of law enforcement in different situations? Which methods of contacting or "educating" the public really make a difference or make the most difference? What are the relative advantages of contacting forest users at their homes or businesses or through mass media, versus contacting them as they use the forests? Developing further the technology involved, training the personnel in the latest techniques, and reconsidering how the organizational structure facilitates and supports fire prevention work—these steps in response to problems involve more than money.

Proposals for Improvement

The third aim of this study was to look for some possible improvements that might be made in the fire prevention work.

From their various perspectives within the organization, personnel intimately involved in fire prevention activities on a day-to-day basis have an excellent platform from which to assess success and failures, strengths and weaknesses of policies and practices in operation. For this reason, impressions were solicited from the fire prevention personnel studied.

Discrepancies between perceived and actual roles and social-organizational obstacles in fire prevention identified from our analysis of the previous interviews were reported back in meetings with the fire prevention personnel on the Forests. The respondents concurred that the analysis correctly interpreted their feelings.

Possible Improvements—The respondents were asked what they felt could be done to make their fire prevention activities more successful. More specifically, what could be done at the District level? What could be done at the forest, regional, and national levels?

By grouping the responses into categories, we found that the possible improvements for the district level cited most often were funds for manpower, more training, and more public education. Just under one-third of the respondents mentioned each of these items.

Somewhat fewer people at the district level mentioned coordination improvements, and funds for supplies.

For the forest level, more law enforcement and more news media coverage were mentioned by about a quarter of the respondents. Fewer mentioned more communication (14 percent), more emphasis on fire prevention (14 percent), and more consistency (11 percent).

What might be done at the national level? One-third of the respondents mentioned more news

media coverage. The next most frequently mentioned suggestion (21 percent) was more emphasis on fire prevention. Then about a tenth mentioned more coordination, more money, more training, and more emphasis on fire and fuel management.

Looking across the entire pattern of responses, money was most frequently mentioned. Beyond that, there were some other needs: more training, more emphasis on fire prevention, and more news media coverage, each of which appear in three of the four levels (*table 4*).

One possible interpretation of these findings is that fire prevention does not receive as much "standing" or "status" in the organization as might be helpful. If it had more status, there might be more attention to developing the fire prevention technology, more technical development of the training aspects, more communication about this part of the work of the over-all organization and more news media recognition, and the like.

Brown and Davis (1973, p. 263) claim that "all fire control organizations, forest, rural or urban, give primary emphasis in carrying out their jobs to preventing as many fires as possible." In a sense that may be true but it sounds a little more like rhetoric than reality. No doubt the fire prevention work of the Forest Service is conducted with care and much is done to foster that effort. But the findings of this study do not lead us to conclude that "primary emphasis" is given to fire prevention work. And our respondents seem to be saying that indeed one way to improve the work is to really give greater emphasis to fire prevention activities, and to do this at all levels of the Forest Service organization, especially at higher levels.

More Useful Information about Improving Fire Prevention Work—Finally the respondents were asked: What would be the most useful information

Table 4—Responses to the question: What could be done to make fire prevention duties more successful?

| At the District Level | | At the Forest Level | | At the Regional Level | | At the National Level | |
|-----------------------|-------------------|----------------------|-------------------|-----------------------|-------------------|-----------------------|-------------------|
| Category | Pct. ¹ | Category | Pct. ¹ | Category | Pct. ¹ | Category | Pct. ¹ |
| Funds for manpower | 32 | More law enforcement | 26 | More news media | 22 | More news media | 32 |
| More training | 30 | More news media | 26 | More emphasis on | | More emphasis on | |
| More public education | 30 | More communication | 14 | fire prevention | 18 | fire prevention | 21 |
| Coordination | 16 | More emphasis on | | More communication | 16 | More coordination | 11 |
| Funds for supplies | 13 | fire prevention | 14 | More money, | | More money | 11 |
| | | More consistency | 11 | equipment | 10 | More training | 10 |
| | | | | More consistent | | More emphasis on | |
| | | | | program | 10 | fire and fuel | |
| | | | | More training | 10 | management | 10 |

¹Percentage add to more than 100 because of multiple responses (N = 63).

about how to make fire prevention work more successful? Most responses to this question concerned a need for determining the effectiveness of various fire prevention activities. Just over one-third of the respondents wanted information about determining the effectiveness of fire prevention activities generally. The second most frequent response (mentioned by just over one-fourth of the sample) had to do with learning new ideas of preventing fires. The third item in terms of frequency dealt with a specific fire prevention activity: "How effective is public relations?" (*fig. 5*).

These and other responses indicated an openness to new ideas and better ways of doing things, and the possibility that the organization might make a worthwhile investment in responding to questions of that kind and, further, in taking steps to insure workable answers are conveyed to personnel doing fire prevention work.

Such responses suggest that one need consists of developing proven fire prevention technology and policy. Particularly needed are procedures and policies for contacting and dealing with all kinds of forest users. Moreover, the means of implementing these procedures and policies into on-going procedures and organizational structures of the Forest Service is needed. Obviously, these kinds of improvements go beyond trying to motivate personnel to do their jobs better. They are examples of

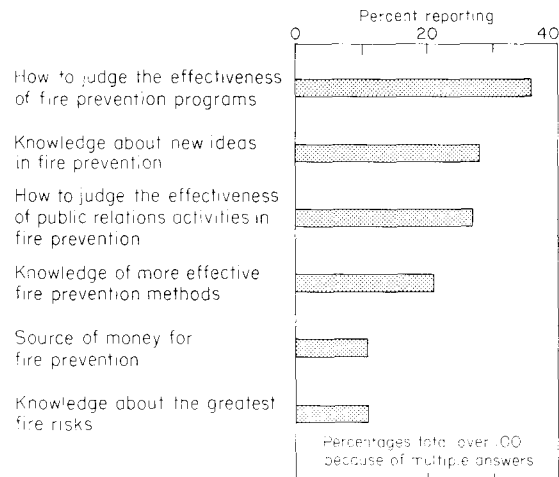


Figure 5—Developing a workable means for judging fire prevention effectiveness is considered the most pressing need to make fire prevention more successful.

activities that might profit from changes that are not simply consequences of faulty individual role performances.

RECOMMENDATIONS

It appears that a number of worthwhile improvements of individual role performance could be accomplished by certain modifications of organizational policies, procedures, or programs, rather than the usual emphasis on how to get better work performance out of individual personnel. This does not mean that individual role performance is beyond improvement. No doubt much could be done there. But it does suggest that a careful examination of the organizational context within which individuals do their work could be most profitable.

What are some of the specific things that might be done? The foregoing information from the respondents has suggested several.

Determination of Success in Fire Prevention—

There is a good deal of variation and some lack of clarity in how people think success in fire prevention is judged. In other words, the criteria and

methods for judging success are apparently not clear and completely agreed upon.

"How to judge effectiveness of fire prevention work generally" and the "effectiveness of public relations efforts" as one specific example, were among the few items of "needed information" most often cited by respondents (*fig. 5*).

The implications of findings like these lead us to the first recommendation:

- Develop better methods of determining the degree of success in fire prevention efforts.

If supervisors cannot tell whether efforts are having the desired effect or whether one person's performance is more successful than another's, then there is no equitable way to reward success more than lack of success. And, if administrators cannot judge with reasonable accuracy which programs or activities are successful, or the general degree of success, then they have no precise way of deciding

whether resources invested in these programs are better put to alternative uses. Similarly, if individuals cannot tell which things work better than others, they have no sound basis for improving their individual performance.

There may be no way to make extremely precise "measurements" of success in fire prevention, but considerable improvement might be made. The question, then, is what improvement could be made.

Development of Advancement Potential Based on Fire Prevention Work—Success in fire prevention activities does not appear strongly related to career advancement in the Forest Service (*figs. 1, 2; table 3*). The farther removed from the field the respondents are, the less importance they tended to place on success in fire prevention work as a basis for advancement in the organization.

This has a number of serious implications for any major efforts to improve fire prevention work. Consequently, the second recommendation addresses this issue:

- Improve methods for enabling personnel to achieve greater advancement in the Forest Service organization through successful fire prevention work.

If fire prevention work is a "dead-end street," or if it is an avenue that is not productive for long-term career advancement opportunities, then some powerful constraints may be operating against successful fire prevention programs. On the other hand, one way of motivating continuing productivity in individual roles is to make it routinely possible or even probable for persons to "get ahead" in the organization by their work in fire prevention roles and programs. One specific aspect of this recommendation includes the communicating of clear instructions about expectations regarding fire prevention duties up and down the organization ladder.

Development of the Social Technology of Fire Prevention—Fire prevention roles in general are not highly standardized, as indicated by the substantial freedom reported regarding what the personnel do, and when they do it. Moreover, the technology is apparently not considered highly technical and complex, as indicated by the response that most of the work is learned by day-to-day job experience rather than expert training (*fig 3*). Of course, some aspects of the jobs could be both standardized and technically complex, but these could not be mastered by on-the-job experience.

The respondents report some of the "hindrances"

to be problems of social technology, problems like law enforcement, getting sufficient training on the latest techniques and programs, and others (*fig. 4*). Recommendations for improvement (*table 4*), include suggestions for more training, as well as for some other changes that involve "social technology," such as public education.

Additionally, the bases on which the respondents judge, and think they are judged in their success, give important place to "public relations activities." This is a social program of work, the technology for which is part of fire prevention activity. And there is a need for more information about effective ideas and methods about social aspects of fire prevention work (*fig. 5*).

Therefore our next recommendation:

- Develop fire prevention technology further – especially the social technology.

Development of More and Better Training for Fire Prevention—As we have mentioned, the data show that most of the work is learned through on-the-job experience (*fig. 3*). And one of the major hindrances reported was "not enough training in the latest techniques and programs" (*fig. 4*).

The respondents' suggestions for improvement (*table 4*) and the kinds of information about new ideas and more effective methods that are reported needed, (*fig. 5*) join with the implications of the previous recommendations in leading to our next suggestion:

- Provide more or better training, or both, for personnel who have fire prevention responsibilities.

Although some of the duties in fire prevention work are simple and routine, many are complex. Many call for actions that are unclear, unspecified, and difficult to implement. Some can be done simply with perhaps a little success, where much success requires complicated and more skilled approaches.

Development of Greater Emphasis on Fire Prevention Work—One of the important ways to emphasize fire prevention work at all levels of the Forest Service organization would be to enhance the opportunities for career advancement based on success in fire prevention work. Yet this emphasis apparently is not the case— especially higher up the organization ladder (*figs. 1, 2; table 3*).

Many other ways to emphasize the place of fire prevention work are available. Without trying to enumerate these, we note that "greater emphasis on fire prevention work at the Forest, Regional, and National levels" was among the suggestions for improvement made by the most respondents. In

addition to rather direct suggestions of this kind, the calls for more public education, more news media coverage, more communication, and the like (*table 4*) also support the interpretation that "greater emphasis at all levels of the Forest Service on fire prevention work" could help improve the success of that work.

- Place and sustain greater emphasis on fire prevention work at all levels of the Forest Service organization.

By more or different communication through the news media, by internal communication in the Forest Service organization, by advancement opportunities, by budgetary allocations, and other means, it appears desirable to increase the emphasis on fire prevention work and its importance in the over-all program of work in the Forest Service. This emphasis would include more attention on a

continuing basis at higher levels of the organization to this work and its place in the total program.

Subsequent to the completion of this study, a report dealing with some of the same concerns as the study was prepared by the National Wildlife Prevention Analysis Task Force (*May 1975*). This inter-agency Task Force was directed by the Chief of the Forest Service to analyze wildfire prevention problems and programs throughout the United States. In several key points, the analysis and recommendations of this Task Force and our own findings and interpretations in this study are remarkably complementary. This is particularly true in the recognition of the need for increased emphasis on wildfire prevention and on the necessity for developing effective fire prevention evaluation procedures and techniques.

LITERATURE CITED

Brown, Arthur A., and Kenneth P. Davis.

1973. **Forest fire: control and use.** 2nd ed. 686 p. McGraw-Hill Book Co., New York.

Loether, Herman J., and Donald G. McTavish.

1974. **Descriptive statistics for sociologists: an introduction.** 388 p. Allyn and Bacon, Inc., Boston.

Sarapata, Adam, and William S. Folkman.

1970. **Fire prevention in the California division of forestry . . . personnel practices.** USDA Forest Serv. Res. Pap. PSW-65, 10 p., Pacific Southwest Forest and Range Exp. Stn., Berkeley, Calif.

The National Wildfire Prevention Analysis Task Force.

1975. **Wildfire prevention analysis: problems and programs.** Washington, D.C., May 1975. 28 p.

Christiansen, John R., William S. Folkman, W. Keith Warner, and Michael L. Woolcott.

1976. **Organizational factors in fire prevention: roles, obstacles, and recommendations.** USDA Forest Serv. Res. Paper PSW-116, 13 p., illus. Pacific Southwest Forest and Range Exp. Stn, Berkeley, Calif.

Problems being encountered in implementing fire prevention programs were explored by studying the organization for fire prevention at the Fish Lake, Uinta, and Wasatch National Forests in Utah. The study focused on role congruency in fire prevention activities and on the social and organizational obstacles to effective programs. The problems identified included lack of consistency and lack of adequate measures in determining success in fire prevention performance; limited career advancement potential based on fire prevention work; need for improvement in fire prevention technology particularly social technology; and need for more emphasis on fire prevention at all levels of the U.S. Forest Service. Recommendations for improving fire prevention performance are included.

Oxford: 432.1(792):903

Retrieval Terms: fire prevention; program evaluation; personnel development; role congruence; organizational obstacles.

Christiansen, John R., William S. Folkman, W. Keith Warner, and Michael L. Woolcott.

1976. **Organizational factors in fire prevention: roles, obstacles, and recommendations.** USDA Forest Serv. Res. Paper PSW-116, 13 p., illus. Pacific Southwest Forest and Range Exp. Stn, Berkeley, Calif.

Problems being encountered in implementing fire prevention programs were explored by studying the organization for fire prevention at the Fish Lake, Uinta, and Wasatch National Forests in Utah. The study focused on role congruency in fire prevention activities and on the social and organizational obstacles to effective programs. The problems identified included lack of consistency and lack of adequate measures in determining success in fire prevention performance; limited career advancement potential based on fire prevention work; need for improvement in fire prevention technology particularly social technology; and need for more emphasis on fire prevention at all levels of the U.S. Forest Service. Recommendations for improving fire prevention performance are included.

Oxford: 432.1(792):903

Retrieval Terms: fire prevention; program evaluation; personnel development; role congruence; organizational obstacles.

Christiansen, John R., William S. Folkman, W. Keith Warner, and Michael L. Woolcott.

1976. **Organizational factors in fire prevention: roles, obstacles, and recommendations.** USDA Forest Serv. Res. Paper PSW-I 16, 13 p., illus. Pacific Southwest Forest and Range Exp. Stn., Berkeley, Calif.

Problems being encountered in implementing fire prevention programs were explored by studying the organization for fire prevention at the Fish Lake, Uinta, and Wasatch National Forests in Utah. The study focused on role congruency in fire prevention activities and on the social and organizational obstacles to effective programs. The problems identified included lack of consistency and lack of adequate measures in determining success in fire prevention performance; limited career advancement potential based on fire prevention work; need for improvement in fire prevention technology—particularly social technology; and need for more emphasis on fire prevention at all levels of the U.S. Forest Service. Recommendations for improving fire prevention performance are included.

Oxford: 432.1(792):903

Retrieval Terms: fire prevention; program evaluation; personnel development; role congruence; organizational obstacles.

Christiansen, John R., William S. Folkman, W. Keith Warner, and Michael L. Woolcott.

1976. **Organizational factors in fire prevention: roles, obstacles, and recommendations.** USDA Forest Serv. Res. Paper PSW-I 16, 13 p., illus. Pacific Southwest Forest and Range Exp. Stn., Berkeley, Calif.

Problems being encountered in implementing fire prevention programs were explored by studying the organization for fire prevention at the Fish Lake, Uinta, and Wasatch National Forests in Utah. The study focused on role congruency in fire prevention activities and on the social and organizational obstacles to effective programs. The problems identified included lack of consistency and lack of adequate measures in determining success in fire prevention performance; limited career advancement potential based on fire prevention work; need for improvement in fire prevention technology—particularly social technology; and need for more emphasis on fire prevention at all levels of the U.S. Forest Service. Recommendations for improving fire prevention performance are included.

Oxford: 432.1(792):903

Retrieval Terms: fire prevention; program evaluation; personnel development; role congruence; organizational obstacles.