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Attitudes Toward Prescribed Fire Policies

The public is widely divided in its support

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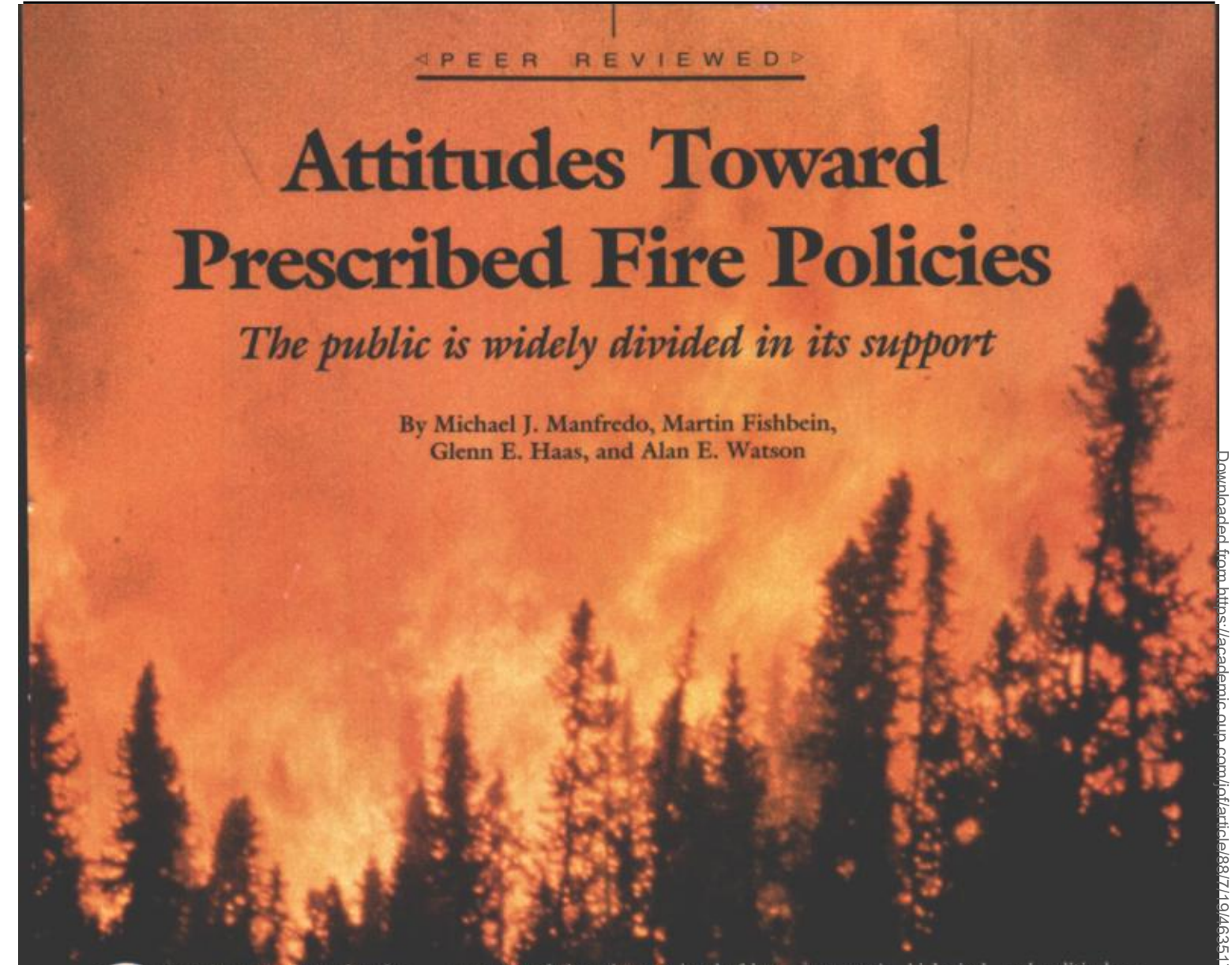

Over the past three decades, land management agencies in the United States have been gradually refining policies to deal with fire in areas with a preservation or wilderness mandate. These "controlled burn," "prescribed burn," or "let-burn" policies specify conditions where fires should be allowed without intervention. They reflect a view that (1) areas with a preservation mandate should be managed so that natural processes predominate, and (2) fires are important natural events instrumental in the dynamic processes that shape wilderness ecosystems (Hendee et al. 1978).

Prescribed fire policies have been justified largely by findings in the biological sciences (Kilgore 1987), but political, economic, social, and physical factors also affect decisions on the acceptability of fires (Daniels and Mason 1985). Any policy regarding fire management greatly depends on the extent to which fires, when they actually occur, exceed the tolerance level of key publics (Bird and Lucas 1985).

Indeed, the fires that occurred in much of the western United States during the summer of 1988 provided the most critical test of prescribed fire policy. They were reported to have burned nearly 4 million acres (Newsweek 1988b) and have been referred to as the most significant ecological event in the history of national parks (Schullery 1989). The magnitude of fire effects raised prescribed fire decisions to national prominence and prompted vigorous debate over the basis for such a policy, the competence of management officials, and the integrity of our entire philosophy of wilderness management (Newsweek 1988a, 1988b; New York Times 1988a, 1988b). Policies are being reevaluated, and all prescribed fire policies for national parks and wilderness ares have been temporarily rescinded (Denver Post 1989).

The reevaluation will involve social, economic, biological, and political aspects of fire policy. This study focused on social considerations of a fire policy—particularly attitudes, beliefs, and behavioral intentions regarding fire policy and knowledge about the effects of wildfire. Land management legislation recognizes that public preference is a central factor in making policy decisions (Culhane and Friesema 1979). Information about public beliefs

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The fires of Yellowstone focused public attention on prescribed fire policies.

can provide a foundation for structuring public education programs on fire (Carpenter et al. 1987) and a baseline against which to measure long-term societal trends and shifts in public awareness (Taylor and Mutch 1986).

Because prescribed fire policy has broad implications for the future of federal lands and land management philosophy, the study considered attitudes held nationwide. In most cases, a lack of public awareness makes national surveys on land management issues untenable. However, it was appropriate in this case because of the possibility that extensive media attention shaped and polarized public attitudes. The study also focused on attitudes in the region most affected by the Yellowstone fires. The results of fire policy decisions are more likely to have a direct effect upon this group, and media coverage and the proximity of the fires probably intensified their attitudes.

Methods

A telephone survey collected data during March and April 1989 for the affected region (defined as Wyoming and Montana) and for the nation (the remaining 48 states). A sample size of 400 for each strata should yield estimates ±5% with a 95% confidence interval. The study sample used a two-stage Waksberg random digit dialing design (Waksberg 1978). Interviews were conducted with 391 subjects in the Montana-Wyoming region and 522 subjects who represented the rest of the nation.

The survey determined attitudes toward prescribed fire policy, intentions to support the policy, and beliefs about the outcome using the theory and methods of Fishbein and Ajzen (1975) and Ajzen and Fishbein (1980). Subjects were asked their opinion of the "controlled burn" fire policy. They were told that this policy had also been referred to as a "let-burn" or "prescribed fire" policy.

Forestry professionals disagree over the terminology that should be used. Professional foresters who reviewed the pretest instrument recommended the term controlled burn. Since this term may not be widely acceptable to other forestry professionals, the more general "prescribed fire" has been used elsewhere in the paper. This policy was defined in the survey as one that allows naturally caused forest fires to burn themselves out if (1) the fire occurs in a natural area set aside by the government, and (2) the fire is not threatening private property.

To assess intention to support a prescribed fire policy, subjects were asked if it was extremely true, quite true, slightly true, neither true nor false, slightly false, quite false, or extremely false that they would support a prescribed fire policy. To measure attitudes, 3 separate questions had to be answered on whether following a prescribed fire policy would be extremely, quite, slightly, or neither (1) good nor bad, (2) beneficial nor harmful, and (3) wise nor foolish.

To determine belief strength, subjects were presented with 10 statements. They were asked whether they agreed or disagreed (extremely, quite, slightly, or neither) that the statement described an outcome of a prescribed fire policy *(table 1)*. A belief evaluation was obtained by asking subjects the same range of responses on whether the outcome was good or bad. The 10 outcomes were developed from open-ended responses made by subjects during pretest procedures.

Five true-false questions on factual knowledge about the outcome of forest fires were replicated from previous studies (Stankey 1976, McCool and Stankey 1986). Further questions provided a background on respondents: recent participation in any of 10 outdoor recreation activities, visits to Yellowstone National Park, education level, size of home community, and race.

In the first stage of analysis, descriptive statistics were computed to determine overall support for the fire policy. Subjects were then divided into 4 groups: regional and national samples with positive attitudes, and regional and national strata with negative or neutral attitudes. These groups were compared on all other measures to discover the basis for either support or opposition.

Results

Respondents from the Montana-Wyoming region indicated slightly positive overall support for the controlled burn policy, while the national sample was evenly divided. In the affected region,

55% would support the controlled burn policy, 41.3% would not support it, and 3.7% were undecided. Among the national sample, 48% would support the policy and 45% would not, while 7% were undecided.

A test for predictive validity of measures revealed a strong prediction of intentions to support (R^2 = .75); both attitude (r = .69, b = .76) and subjective norm (r = .69, b = .14) contributed significantly to the prediction of intention. The correlation between attitude and a belief strength × evaluation index (see Ajzen and Fishbein 1980) was also significant (r = .67, $p < .001$). These results indicate that intention to support the prescribed fire policy is strongly attitudinal-based; therefore, the study investigated the beliefs that formed the basis for these attitudes.

Overall, 53.7% of the national group and 56.8% of the regional group had positive attitudes toward the policy, while 46.3% and 43.2%, respectively, had negative or neutral attitudes. These 4 groups were found to differ on each of the 10 beliefs about outcomes of the controlled burn policy *(table 1)*. In general, mean scores indicated that those with negative attitudes disagreed that a controlled burn policy results in outcomes they rated as "good" (improves conditions for wildlife, saves money), but agreed it would result in outcomes they rated "bad" (destroys natural settings, allows fires to get out of control, affects private property, destroys scenery, results in many animals losing their homes, causes a threat to human lives).

Conversely, those with positive attitudes agreed that the controlled burn policy would result in outcome they rated "good" (improves conditions for wildlife, allows natural events to occur, removes dead vegetation) and disagreed or were neutral that the outcomes would be "bad" (destroys natural settings, causes a threat to human life).

Both positive and negative groups agreed the controlled burn policy destroys scenery and results in many animals losing their homes, both "bad" outcomes. However, those with negative attitudes had much more extreme mean scores on these items for both strength of belief and belief evaluation.

Table 1. Beliefs about the outcome of prescribed fire policies by attitude and region.[1]

	National		Regional	
Response to policy outcome	Negative-attitude group mean	Positive-attitude group mean	Negative-attitude group mean	Positive-attitude group mean
Improves conditions for wildlife				
Agree-disagree	−1.1[a]	0.9[b]	−1.1[a]	1.2[b]
Good-bad	1.4[a]	1.8[b]	1.3[a]	2.0[b]
Destroys natural settings				
Agree-disagree	1.7[a]	0.1[b]	1.7[a]	0.1[b]
Good-bad	−2.1[a]	−1.2[b]	−1.8[b]	−0.9[c]
Allows natural events to occur				
Agree-disagree	0.5[a]	1.0[b]	0.6[a]	1.6[c]
Good-bad	0.5[a]	1.6[b]	0.4[a]	1.6[b]
Allows fires to get out of control				
Agree-disagree	1.7[a]	−0.2[b]	2.3[c]	0.8[d]
Good-bad	−2.7[a]	−2.3[b]	−2.7[b]	−1.8[c]
Saves money by not fighting fires				
Agree-disagree	−0.3[a]	0.5[b]	−1.0[c]	0.5[b]
Good-bad	−1.8[a]	−0.3[b]	−1.8[a]	−0.3[b]
Affects private property				
Agree-disagree	1.0[a]	−0.1[b]	1.9[c]	0.9[a]
Good-bad	−2.5[a,b]	−2.3[a,c]	−2.6[b]	−2.1[c]
Results in removal of dead vegetation				
Agree-disagree	1.4[a]	1.7[b]	1.7[b,c]	2.2[d]
Good-bad	0.2[a]	1.0[b]	0.8[b,c]	1.7[d]
Destroys scenery				
Agree-disagree	2.4[a]	1.1[b]	2.2[a]	0.8[b]
Good-bad	−2.6[a]	−1.7[b]	−2.3[c]	−1.3[d]
Results in many animals losing their homes				
Agree-disagree	2.3[a]	1.1[b]	2.3[a]	0.4[c]
Good-bad	−2.6[a]	−2.2[b]	−2.6[a]	−1.9[c]
Causes a threat to human life				
Agree-disagree	1.3[a]	−0.6[b]	1.4[a]	−0.5[b]
Good-bad	−2.8	−2.7	−2.9	−2.7

[1]*Tests for differences between means were conducted using one-way analysis of variance. F-test statistics were significant on all items except the good-bad scale for "causes a threat to human life." Means with different superscripts ([a b c]) were found to be significantly different using the Student-Newman-Keuls post hoc test for differences between means.*

Table 2. Knowledge about wildfire by attitude and region.[1]

Knowledge statement[2]	Response	National attitude		Regional attitude	
		Negative	Positive	Negative	Positive
		%			
Forest fires usually result in the death of the majority of the animals in an area (F)	True	65.7	50.9	46.2	22.1
	False	19.4	34.2	45.0	67.1
	Don't know	14.9	14.9	8.8	10.8
Most forest fires in the west are started by lightning (T)	True	36.3	42.7	59.8	66.7
	False	36.8	31.3	28.4	20.3
	Don't know	26.9	26.0	11.8	13.1
Complete control of all forest fires would reduce the habitat of animals such as elk (T)	True	37.6	40.7	33.9	31.2
	False	33.9	31.8	51.2	50.7
	Don't know	28.5	27.5	14.9	18.1
Forest fire often proves useful in making minerals and nutrients available to plants and trees (T)	True	40.1	56.2	66.9	84.2
	False	37.2	21.7	17.1	6.3
	Don't know	22.7	22.1	16.0	9.5
Forest fires can be an important force in controlling outbreaks of disease and insects in forests (T)	True	37.2	61.9	71.0	85.6
	False	35.1	15.3	14.8	5.4
	Don't know	27.7	22.8	14.2	9.0

[1]All groups had statistically significant differences using chi square ($p \leq .001$).
[2]Correct answers are indicated in parentheses (T = true, F = false). Correct answers taken from Stankey (1976).

Similarly, both groups agreed that the policy allows natural events to occur and results in the removal of dead vegetation, both positive outcomes. However, the positive-attitude group had more extreme scores.

Response patterns between regional and nationwide respondents different in several areas. Among subjects with negative attitudes, those within the region affected more strongly agreed that the policy would allow fires to get out of control and would affect private property. The positive-attitude group from the affected region agreed more strongly than the positive-attitude national sample that the policy would allow natural events to occur, let fires get out of control, and affect private property. It also more strongly agreed that the policy would result in removal of dead vegetation—and rated that more positively. The positive-attitude national group more strongly agreed that animals would lose their homes—and rated that outcome more negatively.

Overall, the greatest separation among groups occurred for "allows fires to get out of control," "affects private property," "destroys scenery," "results in many animals losing their homes," and "causes a threat to human life."

The 4 groups differed widely on responses to the true-false questions that indicated factual knowledge regarding wildfires *(table 2)*. On 4 of the 5 items, the positive-attitude regional group had the highest proportion of correct responses, followed by the negative-attitude regional group, the positive-attitude national group, and the negative-attitude national sample. Separation of group scores was quite large. For example, the difference between the negative-attitude national group and the positive-attitude regional group ranged between 30% and 50% on 4 of the 5 questions. Also, larger proportions of the national group indicated they did not know the answer.

For the fifth item, "complete control of all forest fires would reduce the habitat of animals such as elk," the results were quite different. More of the national respondents, both positive and negative, answered that item correctly compared to regional participants.

Respondents from the affected region were more likely to be involved in various forms of outdoor recreation than those from the rest of the nation. Only a few differences, however, appeared related to attitudes toward prescribed fire policies. Within the region affected, individuals with positive attitudes participated in overnight backpacking more than those with negative attitudes (21% versus 12%), had visited Yellowstone more frequently in the past 12 months ($\bar{x}$ = 4.6 visits versus $\bar{x}$ = 2.7 visits), had a higher level of education ($\bar{x}$ = 14.1 years versus $\bar{x}$ = 13.1 years), and lived in a large town.

Implications

One purpose of the study was to determine public preferences so that they could be incorporated into revised fire policies. The polarization of the results suggests no clearcut direction to managers and policy-makers in meeting public preferences. In fact, it highlights the difficulty of making decisions about the future of prescribed fire policies that would be approved by a large majority of citizens.

A second purpose was to provide information that would be useful in developing public education campaigns. The findings support the frequent calls for increasing and improving wildfire education efforts (Cortner et al. 1984,

Taylor and Daniel 1984, Baas et al. 1985, McCool and Stankey 1986, Taylor and Mutch 1986, Carpenter et al. 1987). A substantial proportion of Americans are illiterate about wildfire and its effects. The outcome of this survey suggests that as knowledge about fires and fire policy increases, support of prescribed fire policy also increases. While increased education may decrease controversy, it cannot be justified as a way to eliminate opposition to prescribed fire policies. For example, an individual may be quite knowledgeable about the effects of wildfire, but may nevertheless oppose prescribed fire policies because of their perceived negative effects on humans and private property. Yet education is important because a literate public is better able to participate in policy determinations and assist in making decisions that are compatible with societal goals.

The data introduced here revealed several possible strategies for education campaigns. Managers might provide information that alters agreement or disagreement with 1 or more of the 10 outcomes most readily associated with fire policy. For example, a substantial number of people inaccurately believe that prescribe fire results in animals losing their homes. Managers might provide information to clarify this misperception.

Another strategy might be to attempt to change evaluation of a particular outcome. For example, many people evaluated removal of dead vegetation as only a slightly positive outcome. Information focusing on results of fuel buildup might alter an evaluation of its removal. An educational campaign could also add new outcomes to the 10 already identified as the most salient to the public. For example, information might emphasize that prescribed fire creates more food for many animals.

Although our study did not specifically examine the influence of "relevant others" on support for the policy, other research suggests that a ranger influences attitudes toward fire policies (Baas et al. 1985). Therefore, managers might publicize the beliefs of "significant others" on prescribed fire in an attempt to influence subjective norms. Certainly Smokey Bear has had an important influence on attitudes to fire and might help reeducate the public on the role of wildfire and fire policies.

The third purpose of this study was to provide a baseline against which to measure societal trends. Previous studies suggested that public attitudes toward fire and support for prescribed fire are changing (McCool and Stankey 1986, Taylor and Mutch 1986). Although the results of this study do not repudiate this suggestion, they do raise the possibility that previous findings may apply primarily to regions most affected by fire. For example, fire knowledge by Montana and Wyoming residents was found to be generally similar to knowledge by wilderness users in Montana (McCool and Stankey 1986). However, the national-level sample had much lower knowledge scores, raising the possibility that most of the change occurred regionally.

Conclusion

While biological information may provide support for a prescribed fire policy in areas managed with a preservation mandate, that alone is not sufficient justification for its implementation. Fire policy has a critical sociopolitical component, and the fact that people appear poorly informed about the outcomes of fire policy and fire effects adds controversy. The fires of 1988 and the subsequent policy reevaluation reinforce what most managers realize: modern forestry is heavily involved in educating and communicating with the public. Because national attitudes differ widely, policy-makers face major hurdles in establishing fire policies that will be approved by a majority of the public. This provides a challenge to managers as they focus educational efforts on a better understanding of the effects of fire and fire policy. ■

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