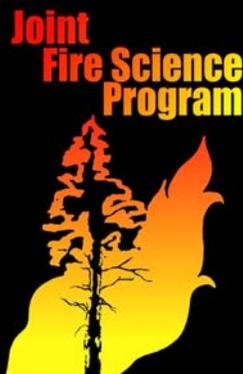


Final Project Report Joint Fire Science Program

June 2005



Evaluating Public Responses to Wildland Fuels Management: Factors that Influence Acceptance of Practices and Decision Processes



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- **Journal Articles**

Brunson, M.W. and B. Shindler. 2004. Geographic variation in social acceptability of wildland fuels management in the western United States. *Society and Natural Resources* 17(8):661-678.

Brunson, M.W., and J. Evans. 2005. Badly burned? Effects of an escaped prescribed burn on the social acceptability of wildland fuels treatments. *Journal of Forestry* 103 (April/May): 134-138.

Toman, E. B. Shindler, and M. Reed. 2004. Prescribed fire: the influence of site visits on citizen attitudes. *The Journal of Environmental Education* 35(3):13-18.

Shindler, B. and E. Toman. 2003. Fuel reduction strategies in forest communities: a longitudinal analysis of public support. *Journal of Forestry* 101(6):8-15.

Toman, E., B. Shindler, and M. Brunson. In review. Fire and fuel management communication strategies: citizen evaluations of agency outreach programs. *Society and Natural Resources Journal*.

- **Book Chapters, Conference Proceedings, and Miscellaneous Reports**

Shindler, B. In Press. Public acceptance of wildland fire conditions and fuel reduction practices: challenges for federal forest managers. Forthcoming in *Humans, Fires, and Forests: Social Science Applied to Fire Management*, Terry Daniel (ed.). USDA Forest Service, North Central Research Station.

Shindler, B. and C. Shaw Olsen. 2005. Fire management, fuel treatment strategies, and public trust in federal agencies. Draft Project Report. Oregon State University.

Shindler, B., M. Brunson, and K. Aldred Cheek. 2004. Social acceptability in forest and range management. Pp. 147-158 in: *Society and Natural Resources: A Summary of Knowledge*, M. Manfredo, J. Vaske, B. Bruyere, D. Field, and P. Brown (eds.). Modern Litho Press: Jefferson, MO.

Shindler, B. 2002. Citizens in the fuel reduction equation: problems and prospects for public forest managers. Chapter 14 in *Fire in Oregon's Forests: Risks, Effects, and Treatment Options*. S.A. Fitzgerald (ed.). Oregon Forest Resource Institute: Salem, OR.

- **Website Homepage**

- **Data Summaries**

Wildland Fire Study: A Nationwide Survey of Citizens. A data summary for the national survey and the seven regional site surveys. 2001-2003. B. Shindler and M. Brunson.

EXECUTIVE SUMMARY

Project Description

Interdisciplinary research is essential to developing scientifically sound and publicly acceptable solutions to wildland fuel problems on federal lands across the United States. Currently, numerous fuel reduction strategies and public outreach activities are underway on federal forests and rangelands. These programs provide an opportunity to assess public understanding and concerns about the types of treatments used to address accumulating fuels. Ultimately, the long-term success of such programs may be determined by how well resource managers translate public responses into supportable policies that fulfill a range of resource values.

This study evaluates the public's understanding and acceptance of different wildland fuel treatments in federal forest and rangeland settings. Specifically, its purpose is to 1) identify the factors that influence the acceptability of fuel reduction strategies and decision processes, 2) examine citizens' understanding of and preferences for management alternatives, and 3) measure public confidence in resource agencies for effective implementation of these practices. The research design employed a three-tier approach to fully address the national significance of wildland fuels and examine the regional and local strategies being implemented by JFSP partner agencies.

This project incorporates:

- a. A national opinion survey to assess the knowledge, information needs, attitudes, and preferences among the American general public,
- b. A network of six regional surveys of more affected publics in fire-prone states (Oregon, Arizona, Colorado, Utah, Georgia, and Florida) to understand public acceptance of management practices, examine the effectiveness of fuels reduction programs, and assess citizen-agency interactions for reaching supportable decisions. Research sites in each state were selected to include a mix of JFSP partner agencies, a diversity of ecosystem types, and management units where fuel reduction activities were planned or currently underway. A site typically encompassed an area of 2-3 counties surrounding a particular land management designation (e.g., national forest, BLM district, National Park). A full description of each site is outlined elsewhere in this report.
- c. Studies at each regional site in which community members were exposed to outreach activities (i.e., brochures, newsletters, site visits, interpretive messages, education programs) and evaluated the usefulness of these various forms of information exchange for fire management.

In the course of these projects, several new opportunities arose and presented the ability to conduct additional case studies relevant to these topics. Copies of these studies are also presented in this report. Collectively, this body of research also is used to focus discussion on

the set of challenges facing federal resource professionals as they attempt to plan for fire and fuels management in local settings.

A central component of this study has been the inclusion of JFSP partners from the outset. Meetings with fire management personnel from the USFS, BLM, NPS, USFWS, and BIA in the study locations resulted in a research design that insured the data obtained are relevant to the needs of federal agency and focus on essential problems. A final phase of the project included presentations of findings at many of the regional study sites with agency personnel as well as presentations at professional meetings and symposia. Our intent was to interpret research findings specific to the region, put useful information in the hands of decision-makers and practitioners, and discuss strategies for communicating management objectives with stakeholders. A number of research publications also derived from this study, including journal articles, book chapters, and project summaries.

Objectives

The purpose of this project is to assess the public's understanding and acceptance of wildland fuel programs on federal forests and rangelands. This study is intended to provide information that will permit us to track and monitor the variables that influence public perceptions and support. By obtaining a better understanding of contributory factors, this research will advance resource professionals' ability to design strategies that address citizens' concerns and improve acceptance of management practices in forest communities.

The specific project objectives are to:

1. Identify the factors that influence the acceptability of fuel reduction strategies and decision processes.
2. Examine citizens' understanding of and preferences for management alternatives.
3. Measure public confidence in resource agencies for effective implementation of fire management and fuel reduction practices.

Methods

A triangulation of social assessment techniques, including survey and interview methodologies, was used to examine public responses to wildland fuels strategies and outreach programs. The research design included collecting empirical data to assess conditions at the national, regional, and local scales.

National Survey: In 2001 a general population mail survey was sent to a random sample of 1720 participants nationwide; 754 questionnaires were completed for a 44% response rate. Part of the design called for examination of similarities and differences between urban/rural populations. To insure a sufficient number of participants in each category, the sample was stratified accordingly.

Regional Surveys: Federal cooperators assisted the research team in targeting the most important investigative priorities and identifying regional study sites where fuel reduction programs are underway. Replicating the national survey design, mail surveys were implemented during 2002 in six states (Oregon, Utah, Arizona, Colorado, Georgia, and Florida) in communities adjacent to federal forest lands. Overall, 905 individuals responded across the six sites. A year later, additional funds were made available by the USDA Forest Service North Central Research Station to implement a companion study in the Great Lakes Region. This mail survey followed similar protocols with responses from 593 individuals in Michigan, Wisconsin, and Minnesota.

Local Information and Outreach: Research at each study site specifically focused on agency communication formats for providing information and interacting with local publics about fire management and fuel reduction. Survey data were collected to see if citizens were familiar with or had been exposed to various outreach strategies (e.g., brochures, newsletters, public meetings, field tours, public service announcements, websites, agency workshops, visitor centers). In addition, citizens rated each on how easy they are to understand, if they are a trustworthy source of information, and their overall level of usefulness.

Results

Primary findings are outlined here. Where state names are used, this is done as a means of convenience; they refer to the specific research sites (typically 2-3 county areas used in our studies and further detailed in this report) and are not meant to represent entire states.

1. Identify the factors that influence the acceptability of fuel reduction strategies and decision processes.

Collectively, this research revealed that a number of factors contribute to the acceptability of management practices and decision processes. In this report, the paper “Public Acceptance of Wildland Fire Conditions and Fuel Reduction Practices: Challenges for Federal Managers” describes the concept of social acceptability for fire management and consolidates these factors into a set of six challenges:

- *Public understanding and management context.* Fire management issues are a low level concern for many citizens, particularly urban residents and those otherwise unaffected by fire thus far. Achieving wide-spread understanding and acceptance of fuel reduction programs is hindered by this imbalance. Large-scale, one-size-fits-all management solutions are unlikely to succeed. Specific attention to conditions and public expectations at the community level makes sense because local residents are directly and disproportionately affected by fuel treatments applied at the forest interface.
- *Knowledge and information delivery.* Knowledge of fire and fuel management is a primary factor in public acceptance of agency programs. Technical information is useful to citizens, but information alone is rarely enough to change peoples’ opinions or behaviors. Essential elements in information delivery and the credibility of the information provider are often overlooked. How and where citizens get information

matters greatly, facts do not speak for themselves. They must be appreciated and interpreted by individuals.

- *Decision-making processes.* Technically sound and economical decisions are insufficient for achieving public acceptance. In most cases, the public's idea of a legitimate plan corresponds to the quality of decision-making procedures. Of particular importance in forest communities is the opportunity for citizens to participate in each phase of the process. Managers have had success where they have outlined the public's role in planning, framed the options in clear and meaningful terms, created opportunities for agency personnel and citizens to examine risks and consequences of various choices, and work out strategies to unique local problems.
- *Trustbuilding.* Trust in agency personnel is the most significant predictor of agency effectiveness for managing fire and fire risk. People want assurance that fuel treatments will be carried out by professionals and that prescribed fire will be safely controlled. An important trust component is how residents view agency efforts to communicate about fuel treatments. Trusting relationships can be organized around six common factors: 1) inclusiveness, 2) sincere leadership, 3) innovative and flexible communication, 4) early commitment to and continuity of community-based planning, 5) sound planning skills, and 6) efforts that result in action on the ground.
- *Visual quality and perceptions of "natural conditions."* Aesthetics may be the first of one of the few pieces of information by which citizens judge fuel reduction activities. A central problem is that many of our forests now encompass different age classes, stocking levels, and stand densities than what professionals believe are healthy, but are considered "natural" by the public. While the initial basis for personal judgments of forest conditions is visual, it is clear that a more comprehensive, holistic form of public evaluation (e.g., an ecological aesthetic) is needed.
- *Risk and uncertainty.* Although fuel reduction treatments are largely about reducing risk, there can be real concern over the uncertainty (and even risk) of these management programs. For example, citizens are worried about loss to private property, loss of wildlife habitat, increased smoke, and affects on their water supply. Bridging the gap requires explanations that take into account public concerns, different levels of understanding, and present the logic behind choices as opposed to standard messages that merely gloss over details.

Deriving from the above discussion of acceptability factors was also a set of "lessons learned." Important points here include the need to:

- Develop the capacity within agencies to respond to public concerns and organize action for fuel management.
- Experiment with methods for involving citizens in fuel and risk reduction... make fire management everyone's responsibility.
- Approach trustbuilding as the central, long-term goal of effective fire management programs.

The national and seven regional surveys also resulted in findings useful to understanding issues surrounding public acceptance of fire management and fuels reduction.

- Overall, respondents generally find fuel reduction practices acceptable. At least 80% rated three forms (prescribed fire, mechanized vegetation removal, and livestock grazing) as tools that managers should either have full discretion to use or use in carefully selected areas.
- We found differences in acceptability associated with geographic location for prescribed fire and mechanical vegetation removal. Utah residents were less likely than respondents in other locations to give full acceptance of both treatments. Oregon respondents had fewer concerns about prescribed fire than others. However, prescribed fire is most accepted in areas with recent catastrophic wildfires.
- Acceptance of treatments tended to be influenced by traditional use and familiarity with various practices. For example, mechanical thinning and prescribed fire are more acceptable in Oregon (where these tools have been used for some time) and livestock grazing is most preferred in Utah and Arizona.
- As in previous studies, correlation analysis showed that higher levels of participant knowledge about prescribed fire and mechanical removal were associated with higher levels of acceptability for these practices. Similarly, our data confirmed greater acceptance of prescribed fire and thinning practices among men and more support for thinning among those who favor economic concerns over environmental ones. Unlike other studies, however, we found no correlation between education level and support for either practice.
- There was no correlation between proximity of residence to forest lands and acceptance of fuel reduction practices.
- Several interesting, but conflicting caveats emerged regarding acceptance of fuel reduction practices, suggesting managers will need to interact with residents to come to agreement about the proper course of action. For example, about half of respondents overall thought that “following nature's way” is preferable to human intervention in ecosystems. Another 25% thought that all fires should be put out as soon as possible. And while a majority agreed that fire risks are so great in some states (OR, AZ, FL, GA) that managers need to use any means necessary to reduce them, only 14% in the Lake States felt the same way.
- Findings confirm the importance of understanding the geographic context of acceptability judgments. Associations can be made with both social (urbanization) and biophysical (dominant land uses) environments in each study location. For example, one of our case studies (Cascade Springs) indicates that while citizens generally accept the use of prescribed fire, many doubt the agencies’ ability to use it effectively near populated areas. Planning for contextual circumstances may mean the difference between public acceptance and resentment toward policies.

2. Examine citizens' understanding of and preferences for management alternatives.

- On the national level, considerable lack of awareness about wildland fire and fuels practices exists among the general public. For example, one-third of those responding had given no thought to wildfire, with residents in urban areas being the least concerned. In addition, only about half knew what prescribed fire is, or about the benefits of this treatment, and most were unsure about the effects of prescribed fire on ecological processes.
- Participants in the regional studies (residents of communities close to forests and rangelands) were much more concerned and knowledgeable about wildfire. A large majority (85%) often thought about wildfires, especially the potential for one near their home. Among the knowledge measures, large majorities understood that some plants need fires to regenerate, that fires do not typically kill most animals, and that stream water quality is reduced in the first years after a burn. Some areas of low understanding still exist; for example, a majority of respondents in all study areas (except Colorado) believe that humans cause most of the wildfires in their state. In general, westerners were more likely to answer questions about wildfire correctly than southerners or those in the Lake States.
- Residents across the study regions believe that prescribed fire, mechanical vegetation removal, and livestock grazing should be part of the discretionary toolbox for fuels management on public lands. Just 6% felt these methods should not be considered as fuel reduction tools.
- Among the treatments, respondents tended to be more wary of using prescribed fire, especially at the wildland urban interface, and that it should be used only infrequently.
- Westerners did not show a preference between prescribed fire and mechanical vegetation removal. However, the use of prescribed fire is favored in the southern states where it is already common and often the only effective treatment. Southerners also more readily accepted the use of fire in populated areas.
- While about half of respondents overall agreed that smoke from prescribed fire is managed acceptably, few believe that prescribed fire is "not worth it" because of the smoke (just 10% or less in each state).
- Concerns about smoke effects seem greatest in Arizona than elsewhere, which makes sense if we consider that many people have moved to Arizona due to air quality concerns.
- People get information from a variety of places. The information sources that citizens pay attention to and found most useful are television, radio, and newspapers. The least useful were industry groups, the internet, and agency public meetings.
- Overall, interactive approaches are much preferred forms of information exchange; these involve experiences at visitor and interpretive centers, field trips to demonstration

sites, school environmental education programs, and direct conversations with agency employees.

- More general “bulk” forms of communication (brochures, newspaper articles, web sites) are less effective and offer little opportunity to determine if information is received and understood.
- Video messages are good for building awareness of fire issues, but results suggest they are not particularly useful for communicating specific information about treatment alternatives.
- Agency public meetings, especially traditional scoping sessions to fulfill NEPA requirements, received low ratings. Citizens appear more interested in meetings to address their local concerns and that provide an opportunity for more meaningful community involvement.

3. *Measure public confidence in resource agencies for effective implementation of fire management and fuel reduction practices.*

- Trust is an essential factor in public acceptance of agency programs for fuel reduction. Public trust for implementing fire management programs is much higher in federal agencies than local or state government, particularly for the Forest Service and the National Park Service.
- Correlation analysis indicates that two variables emerged as significant contributors to trust among citizens: 1) that agencies do a good job of incorporating public concerns into management plans and 2) the opportunity for citizen participation and interaction.
- Risk and uncertainty about fire management is often associated with how well the public responds to agency programs. Regarding the use of prescribed fire, citizens are most concerned about damage to private property, increased smoke, soil erosion, and loss of wildlife habitat.
- Citizen access and involvement in planning management programs has always been an essential component to public confidence and acceptance of ensuing practices. In this study, a strong majority of respondents in all states agree that citizen participation in land management is valuable, even if adds to the cost of government.
- When asked about the most realistic role for citizens in public land management, people in each state most frequently chose one of two moderate options: serve on advisory boards that review and comment on decisions, or provide suggestions and let the natural resource professionals decide.
- Respondents in each state generally thought that the agencies do either a good or fair job of incorporating public concerns into decisions. However, ratings overall were not particularly high; more participants thought the agencies do a poor job than thought they do an excellent job.

- Findings recognize the contributions of adult learning theory by suggesting that three essential principles can play a role in the effectiveness of agency outreach programs. A problem-centered approach to learning is favored by most adults and suggests communication will be most effective when it demonstrates applicability to salient, real-world issues. Also, because peoples' experience helps shape their understanding of and attitudes toward management action, interactive programs allow participants to incorporate relevant information (along with prior experience) for solving specific problems. Third, the importance of trustworthy citizen-agency relations overrides most all other factors. In the context of information exchange, trust is more likely to develop through personal contact and interaction than in anonymous information provision.
- Although it may be more efficient to use standardized, agency-wide communication devices, messages that target local priorities and specific environmental context are likely to be more trustworthy among forest communities.
- A primary contribution of this study is in recognizing the importance of citizens as participants in the outreach process rather than as passive observers.

ACCOMPLISHMENTS

Project Publications, Executive Summaries, Journal Articles, Book Chapters

Included in this final report are numerous publications that resulted from this study. Several are in draft form as they are still in-progress. Those that have been published may also be found on the website listed below. Most are in pdf format and can be downloaded.

Description of Study Sites

A detailed description of the six study sites used in our initial six state regional survey.

Executive Summaries

Wildland Fire Study: A nationwide survey of citizens. B. Shindler and M. Brunson. 2001.

Fire Management on Public Forests and Rangelands: A survey of citizen's in southeast Georgia and northeast Florida. B. Shindler, M. Brunson, and E. Toman. 2002.

A Survey of Citizens in Central Oregon: Jefferson and Deschutes Counties. B. Shindler, M. Brunson, L. Gilbert, and E. Toman. 2002.

A Survey of Citizens in Central Georgia: The Piedmont Plateau Region. B. Shindler, M. Brunson, and E. Toman. 2002.

A Survey of Citizens in Utah's Great Basin: West Salt Lake/Tooele Region. M. Brunson, B. Shindler, and E. Toman. 2002.

A Survey of Citizens in Colorado's Estes Valley and Front Range Communities: Larimer and Boulder Counties. M. Brunson, B. Shindler, and E. Toman. 2002.

A Survey of Citizens in the Central Arizona Highlands: Yavapai County. . M. Brunson, B. Shindler, and E. Toman. 2002.

Fire Management and Forest Conditions: Public Acceptance in the Great Lakes Region. B. Shindler, E. Toman, and C. Shaw. 2003.

Interview Summary: U.S. Forest Fire and Fuels Management Personnel in the Great Lakes Region. B. Shindler and A. Wright. 2001

Fire Management on Public Forests and Rangelands: Regional and Age Group Comparisons of Knowledge and Attitudes about Wildland Fuels Management. J. Evans and M. Brunson. 2004.

Effects of the Cascade Springs Fire on Public Perceptions of Wildland Fuels Treatments. M. Brunson and J. Evans. 2004.

A Social Assessment of Ecosystem Health: Public Perspectives on Pacific Northwest Forests. B. Shindler, J. Wilton, and A. Wright. 2002.

Book Chapters and Conference Proceedings and Miscellaneous Reports

Shindler, B. In Press. Public acceptance of wildland fire conditions and fuel reduction practices: challenges for federal forest managers. Forthcoming in *Humans, Fires, and Forests: Social Science Applied to Fire Management*, Terry Daniel (ed.). USDA Forest Service, North Central Research Station.

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Shindler, B. 2002. Citizens in the fuel reduction equation: problems and prospects for public forest managers. Chapter 14 in *Fire in Oregon's Forests: Risks, Effects, and Treatment Options*. S.A. Fitzgerald (ed.). Oregon Forest Resources Institute: Salem, OR.

Journal Articles

Brunson, M.W. and B. Shindler. 2004. Geographic variation in social acceptability of wildland fuels management in the western United States. *Society of Natural Resources* 17(8):661-678.

Brunson, M.W., and J. Evans. 2005. Badly burned? Effects of an escaped prescribed burn on the social acceptability of wildland fuels treatments. *Journal of Forestry* 103 (April/May): 134-138.

Toman, E. B. Shindler, and M. Reed. 2004. Prescribed fire: the influence of site visits on citizen attitudes. *The Journal of Environmental Education* 35(3):13-18.

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Toman, E., B. Shindler, and M. Brunson. In review. Fire and fuel management communication strategies: citizen evaluations of agency outreach programs. *Society and Natural Resources Journal*.

Conferences Organized

Wildland Fire Conference. Bridging the World of Fire Managers and Fire Researchers. Bruce Shindler. Joint Fire Science Program and the National Fire Plan. Oregon State University, March 2003.

Presentations

How Badly Burned? Public Perceptions of Wildland Fuels Management Before and After Cascade II. Mark Brunson. Annual meeting, USDA Forest Service Regional Fire Management Officers, Ogden, UT, April 2005.

Communication Strategies for Fire Managers: Creating Community Partnerships. Bruce Shindler. USDA Forest Service, Region 6, District Ranger Summit. Tacoma, WA. April 2005.

Reducing hazardous fuels on rangelands: What methods will citizens accept? Mark Brunson. 58th annual meeting, Society for Range Management, Fort Worth, TX, February 2005

Public Acceptance of Wildland Fire Conditions and Fuel Reduction Practices. Bruce Shindler. 10th International Symposium on Society and Resource Management,” Keystone, CO. June 2004.

Badly Burned? Effects of an Escaped Prescribed Burn on Social Acceptability of Wildland Fuels Treatments. Mark Brunson and Jessica Evans. 10th International Symposium on Society and Resource Management,” Keystone, CO., June 2004.

Creating Fire Resilient Landscapes: Improving our Understanding and Application. Bruce Shindler. Oregon State University Symposium, Medford, OR. March 2004.

Leading Fire Communications into the Future. Bruce Shindler. National Park Service Workshop, Sequoia-Kings Canyon National Parks. February 2004.

Post-fire Restoration and Salvage Harvesting: Applying our Experience and Knowledge. Bruce Shindler. Society of American Foresters Symposium. Bend, OR. October 2003.

Attitudes and Knowledge about Wildland Fuels Management: A Six-State Comparison. Mark Brunson and Bruce Shindler. 9th International Symposium on Society and Resource Management, Bloomington, IN, June 2002.

Smoke, Stumps and Safety: The Social Acceptability of Managing Wildland Fuels on Public Lands. Mark Brunson. Plum Creek Lecture Series, University of Montana School of Forestry, Missoula, Mont., April 2002.

Wildfire Hazard Reduction and Prevention. Mark Brunson. 26th Annual Workshop on Hazards Research and Applications, Boulder, Colo., July 2001.

Social Acceptability of Fuel Treatments on Public Lands. Bruce Shindler. Bolle Center, University of Montana. October, 2001.

Data Summaries

Two data summaries have been created for tracking and monitoring purposes. They are also available to other researchers who wish to replicate our studies or do follow up research in specific areas. One is a master frequency report that includes data for all questions asked on our national study and the seven regional studies. A copy is attached in this report and is also on the website listed below. A master data set for our six-state study is also posted on the website. It is an excel file suitable for statistical measures and comparative analysis.

Website

A website for this project has been created at <http://oregonstate.edu/~shindleb/jfsp>. It can also be linked from the Joint Fire Science Program website.