

Project Title. A Panel Study Of Michigan Homeowners: Examining Perceptions Of Wildfire Risks & Fuels Management Over Time

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I. Problem reference.

This study is part of a larger program of work funded under the National Fire Plan Study, 01.NCS.D.1, *Modeling people's responses to stand and landscape level treatments for preventing wildfires and restoring fire affected areas.*

In fire-prone areas of the U.S., resource and fire prevention agencies encounter varying levels of public support for forest fuels management strategies (e.g., prescribed fire). In some WUI areas, support for the land manager's preferred approach to fuels management is so low that it forestalls prudent risk reduction actions. Understanding the explanatory factors underlying expressed levels of support for fuels management strategies will help public land management agencies develop meaningful partnerships and public participation strategies with affected publics. A key question is how ongoing educational and fuels management efforts change public views. However, most studies to date have only examined public opinion at one point in time. This proposed study will extend our current research to include a panel survey design to test changes in beliefs, attitudes and support for fuel management approaches over time. We will also examine the awareness of or exposure to fuel management approaches from 2002 to 2006 in the study area to relate any changes in attitude to reduction or suppression approaches.

II. Literature.

Under the National Fire Plan, a number of social science researchers (e.g., Schindler, Ryan, Vining, Monroe, Nelson, Vogt, Winter, Fried, Stewart, McCaffrey) have been studying public acceptance of or support for fuels management. Overall, current research suggests general public support with variations by geographic area, type of fuels applications, and local wildfire history. We originally hypothesized that demographic variables would explain some of the variations in support. For example, long time residents might be more accepting than recent residents, or permanent residents would be more accepting of fuels management than seasonal residents. Other demographics such as income and education were also expected to explain support variation. But after data collection in a half dozen areas, these hypotheses were not supported. Instead, our work

and others (e.g., Schindler) found homeowners have beliefs, values, and attitudes which influence support for fuel implementation in a local area.

Our research thus far (Winter, Vogt and Fried, 2002; Winter, Vogt, and McCaffrey, 2004; Vogt, Winter and Fried, 2005) has examined homeowners' attitudes toward and approval of using fuel management approaches in WUI areas: specifically, prescribed burning, mechanical fuel reduction and defensible space ordinances. We sought to test the strength of beliefs and attitudes in predicting support for implementing each fuel management approach, based on theories (Ajzen and Fishbein, 1975; 1980) which link cognitive thinking and knowledge to intent to behave. We have explored relationships among beliefs held about each fuel management approach, attitude toward these approaches, and intention to approve of the implementation of each approach.

Our research has shown patterns in predictive variables across fuel management approaches and study sites (Vogt, Winter, and Fried, 2005). For instance:

- **Attitude** is related to **approval** for implementation of prescribed burning, mechanical fuel reduction and defensible space, at estimated betas, which ranged from 0.51 (mechanical reduction in Michigan) to 0.75 (defensible space in California), while controlling for **trust** in the agency to implement the fuels approach.
- **Trust** is also related to implementation **approval** – estimated betas ranged from 0.09 (defensible space in California) to 0.32 (mechanical reduction in Michigan), while controlling for **attitude**.
- **Personal importance** of the fuel management approach is related to **attitudes** held for that approach – estimated betas ranged from 0.27 (prescribed burning in Michigan) to 0.73 (defensible space in California), while controlling for **belief** that the approach will achieve the outcome stated.
- Selected **beliefs** are related to **attitudes** held for approaches. For example, the belief that any of the three fuel approaches can reduce the cost of firefighting was positive related to attitudes – estimated betas ranged from 0.10 (defensible space in California) to 0.27 (defensible space in Florida), while controlling for other **belief strengths** and **personal importance**.

In Michigan, the following results were found (see Vogt, Winter, and Fried; 2002;):

- Homeowners held more positive attitudes toward mechanical fuel reduction (one scale point above “neutral”) as a fuel reduction technique, than attitudes held about defensible space or prescribed burning.
- One in five homeowners indicated past experience with prescribed burning, one in ten homeowners experienced mechanical thinning, and four in ten homeowners voluntarily removed flammable vegetation near their home. Almost no one indicated being required to remove vegetation suggesting no or few codes or enforcement of codes.
- Trust appears to be a concern in this Michigan area. Past catastrophic fires have resulted in weak trust levels across all types of trust – use of prescribed burning, mechanical thinning, or defensible space; communications to residents about burns or forest issues, in general.

III. Objectives.

Given the increased focus on fuels management and public outreach efforts that have resulted from the National Fire Plan, a key question is whether and how these ongoing efforts change public views. But most studies to date have only examined public opinion at one point in time. This proposed study will examine homeowners at two time periods to assess changes in public opinion and support after several years of fuel management implementations.

Our overall objective is to provide resource managers and researchers with a further understanding of homeowners perceptions and approval of fuel management approaches. We have developed a standardized decision support tool that has shown to be reliable and valid across wildland urban interface areas in CA, FL, MO, CO and MI. More specifically, the following research questions will guide our methods:

- Will the relationship between attitudes held for a fuel management approach and approval for implementation become stronger as fuel and risk reduction efforts continue in NFs?
- Will additional positive beliefs (i.e., restores wildlands – “healthy forest”, improves wildlife conditions) be significantly related to attitudes held for a fuel management approach?
- Will trust in a fuel management implementation increase? (based on the premise that catastrophic fires are further in the past and heightened fuels work is building greater trust)
- Will seasonal homeowners differ from permanent homeowners on these measures as they are likely to spend less time in the area and may hold less awareness or exposure to fuels management over the past four years?

IV. Methods.

The baseline questionnaire data from homeowners that was collected in Michigan was preceded with a focus group held with homeowners and another with resource managers and stakeholders in the Mio area (Winter, Vogt, and Fried, 2002). Following the focus groups that helped identify local issues and understanding by homeowners of the three fuel management approaches (prescribed burning, mechanical fuel reduction, defensible space), an eight-page questionnaire was developed and then tested in three WUI areas – California, Florida, and Michigan. More recently, this questionnaire has been implemented in Missouri with homeowners in the Mark Twain NF interface.

We believe Michigan is appropriate for a panel study for several reasons:

- The highest response rate thus far occurred with our Michigan data collection efforts (53%) suggesting a high level of interest in the topic by homeowners. Also, our sample size for the baseline data collection was over 2,000; thus affording us over 1,200 respondents from the first stage of panel.
- While Michigan has not had large recent wildfires like California or Florida or western states, the risk exists.
- Resource managers are active in creating fuel breaks, collection sites for homeowner fuels, and other programs targeted at homeowner risks.
- The three counties in Michigan (Oscoda, Crawford, Ogemaw) provide a study site with a mixture of permanent and seasonal homeowners, federal and state forest (Au Sable State Forest) management, a history of catastrophic fires (Mack Lake, Stephan Bridge), jack pine forest management for the Kirtland Warbler, and moderately frequent wildland fires, fuel breaks and prescribed burns.

The panel study is designed to resurvey all past respondents and attempt another try at our previous nonrespondents. Our goal is to include the following groups in the design:

1. matched first and second surveys.
2. new homeowners second surveys only, and
3. nonrespondents from the first survey who participate in this second testing (Table 1).

Our original sample was not homeowners in entire counties or any local government geographic boundaries, but instead based on experts (i.e., Forest Service managers) defining the high-risk areas and then including all residents in those areas. For Michigan, more spatially coarse techniques were used to identify areas where homeowners face the risk of wildfires. In all three states, extensive discussions were held with federal and/or state agency foresters and fire managers to refine our area selection. Thus, our sample represents specific areas of each county where homeowners and potentially flammable vegetation fuels were present. Only properties for which tax assessor records indicated the presence of a structure with a value of at least \$25,000 were treated as part of the population of interest (to eliminate vacant lots). In all areas, single-family homes and mobile homes were considered to belong to the population of interest.

For this second testing (or post-test), we will attempt to use the same criterion to select recent homebuyers (since 2002) from the property tax database. Therefore, we will need to work closely with the Forest Service and local tax assessors to identify new homebuyers and any house sales or address changes. Our first project geo-referenced respondents by manually finding situs addresses in the field and taking a gps read. These may also assist us in the effort of updating our population. Finally, we can have our final list checked for good/bad addresses at a commercial mail house to reduce the amount of returned mail from our first mailing.

Overall, a sample of 2,550 for the post-test sample will be selected. Using a Dillman (1979) mail procedure, each address (either local for permanent homeowners or nonlocal for seasonal homeowners) will be mailed (first class) a personalized cover letter, questionnaire and a business reply envelope. A sample of nonrespondents (n=200) will be sampled to test for any nonresponse bias in key variables (e.g., belief, attitude, support). The suggested method of recontact would be mail with an abridge version of the questionnaire. If possible, phone numbers or e-mails could be requested from local governments, however, this has not been available in the past.

Table 1. Sampling Frame for Post-test Michigan WUI Homeowner Sample

	<i>Respondents Spring, 2002</i>	<i>Nonrespondents Spring, 2002</i>	<i>New Homeowners (purchase 2002-2005)</i>
Original Baseline (Sample – March, 2002)	1,253 ^a	1,099	N/A
Proposed Post- test (Sample – March, 2006)	1,253 with est. 125-250 returned as undeliverable ^a ; 600-700 respondents (est 50% response	Randomly select 600; estimate 200 respondents (est 33% response rate)	Est. population, select all or sample up to 650 homeowners; 250-300

	rate)	respondents (est 50% response rate)	
Nonresponse check (Fall, 2006)	100	50	50

^a It is estimated that 10-20% of them have moved and may not be reachable in 2006.

V. Quality assurance/quality control procedures.

This study will start with a review of existing homeowner information which has been saved and stored for any future uses. All data are in tact. Besides a review of this grant proposal, any survey methods and protocols (questionnaire) will be shared and reviewed with researchers at NC and Huron-Manistee NF staff. Once a draft questionnaire is complete, a human subjects review at Michigan State will occur. When completed questionnaires are returned they will be stored in a safe, locked area. When the data are keyed, 1 or 2% of the surveys will be reviewed for any keying error. Results of the study will be shared and reviewed with the forest and NC staff before publishing. Any refereed manuscripts or conference proceedings will also undergo blind-or nonblind review, depending on how the conference is judged.

VI. Application of research results.

Outcome: The goal of this work is to provide longitudinal findings on public support of fuel management. Many cross-sectional studies have been recently completed, however, this study is not only longitudinal, but panel (same respondents studied 4 years later). A clearer understanding of how public views of fire management change over time and the influence of educational and fuels management efforts on those views can help managers design more socially acceptable fuels management plans and engage in more effective outreach.

Outputs: Research outputs will include:

- Prospectus of the study (2 page description of study)
- Full data report of the results, including both data points and change.
- One or two conference presentations with proceedings.
- One or two refereed manuscripts in natural resource journals.

Tech Transfer

We have a strong track record on tech transfer both with applying this method to many National Forest areas, as well as maintaining a website. We will work with the NF staff to exchange findings and application of findings.

- The project led to the development of a standardized procedure to measure publics' attitudes and support for fuels management approaches at the local forest level. Investigators are currently assisting forest managers at Mark Twain National Forest use these tools for local forest planning activities.
- One or two-page executive summary report with graphics for distribution and web-site.
- Presentation of results to Huron-Manistee staff.
- Continue to maintain and add to our project web site: www.fire-saft.net

VII. Safety and health.

No known safety or health hazards are known. We will not be studying actual fires or visiting homeowners at their homes. As mentioned, a few trips to the area will be made.

IX. Environmental analysis considerations.

All of the work described in this study plan is covered under the categorical exclusion for research activities (7 CFR 1b.3(3) and FSH 1909.15 31.1a(3)). In addition, the research will not result in any extraordinary circumstances involving environmentally sensitive situations or conditions (FSH 1909.15 30.3 2). Finally, the research is not connected to or a source of significant cumulative impacts.

X. Personnel assignment, time of completion, and cost.

A. Budget: Attached

B. Staff:

Christine Vogt, Ph.D. is an associate professor in the Dept. of Community, Agriculture, Recreation and Resources Studies at Michigan State University. At MSU, she co-leads research on trails in Michigan for Michigan Department of Transportation, and leads research on safe routes to school for elementary-aged students in Michigan, funded by the same agency. She is also a researcher on a fire study team with Greg Winter, Jeremy Fried, and Sarah McCaffrey. Their research has been funded by the Joint Fire Science Program, USDA FS with the North Central Research and PSW Research offices. Vogt has published past Forest Service research in *Leisure Sciences*, *Journal of Leisure Research*, *Annals of Tourism Research*, *Journal of Forestry*, and *Society and Natural Resources* and presented at many recreation conferences. Recently, she has been asked to review other's wildfire research for both journals and FS publications.

Gregory Winter is President and Research Director at Cornerstone Strategies, Incorporated, a research and planning firm in Bellingham, Washington. He has over 15 years of experience in natural resource and environmental fields. Specialties include natural resource management and natural resource social research including public participation, natural resource valuation, and market-based approaches to manage natural resources and pollution. He currently specializes in quantitative and qualitative social science research in support of public policy, planning and rural community development. He has published research on social aspects of wildland fire in refereed journals, including *Society and Natural Resources*, *Journal of Forestry*, *International Journal of Wildland Fire* and *Forest Science*.

C. Timeline:

Phase 1. Planning and Preparation – June 2005 to Spring 2006

- Review and improve upon research process used in first phase of panel (or pre-test), update and validate homeowner records from

baseline measure of homeowners, and review and analyze pre-test dataset by descriptive and multi-variate analysis.

- Write a new prospectus to share with resource managers and media
- Travel to study area and meet with resource managers. Identify recent (in past four years) fuels work, wildfires, public involvement/ processes, etc. to be able to discuss why change may have occurred?

Phase 2. Survey Implementation – Spring 2006 (to be consistent with season of first phase of panel).

Phase 3. Analysis, Reporting, and Article Writing – Summer 2006 to December 2007

- Focus of analysis and reporting will be on homeowner cognitive and behavioral changes from Spring 2002 to Spring 2006.

VIII. Literature Cited

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Winter, G., C.A. Vogt, and S. McCaffrey. (2004). "Examining social trust in fuels management strategies." *Journal of Forestry*, September: 8-15.

Vogt, C., G. Winter, & J. Fried. (2005). "Homeowners' Support for Various Wildland Fire and Fuel Management Approaches." *Society & Natural Resources*, 18.5(May/June), in press.

Additional notes:

Contacts in the Huron Manistee, include: David Reigle, FMO; Assistant FMO, and Prevention Technician. We worked with Reigle in 2002 and have been in contact with him (SM) regarding this post-test of homeowners. He is supported of the research.