FOREST FUELS TREATMENTS FOR WILDLIFE MANAGEMENT: DO LOCAL RECREATION USERS AGREE?

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Abstract.—In recent years, managers, policy makers and researchers, particularly in the social sciences, have worked to better understand the perspectives of homeowners, residents, tourists, and recreationists on wildfire and fuels management and how resource agencies can better involve these stakeholders in planning and implementation (Vogt et al., 2006). This research examined how one group of stakeholders, homeowners who participate in local outdoor recreation, viewed the relationships between fuel treatment approaches and improved wildlife conditions. Specifically, we studied hunters, anglers, and wildlife viewers who were also wildland interface homeowners in a three-county area of Huron-Manistee National Forest (HMNF). Study participants generally viewed "prescribed burning" as more likely to improve wildlife conditions than mechanical fuel reduction or a defensible space ordinance. Moreover, the two largest recreation user groups in the population (hunters, anglers) were more likely than wildlife viewers to expect prescribed burning to have benefits for wildlife.

1.0 INTRODUCTION

In recent years, managers, policy makers and researchers, particularly in the social sciences, have worked to better understand the perspectives of homeowners, residents, tourists, and recreationists on wildfire and fuels management and how resource agencies can better involve these stakeholders in planning and implementation (Vogt et al., 2006).

According to a report from the United States Department of Agriculture (Reeder & Brown, 2005) and tracking by other researchers (e.g., Johnson, 1999), residents of urban areas in America have been moving into rural areas located in or near natural areas, such as forests, parks, and open spaces. The wildland-urban interface (WUI) is often attractive to residents, permanent and seasonal, for the nearby recreation opportunities and natural, aesthetic setting that a forest can provide (Stewart & Stynes, 1994; Monroe & Nelson, 2004; Winter et al., 2005). The population of rural counties around wildland areas has increased 23 percent, compared to 11 percent population growth nationwide between 1970 and 1988 (Bailey, 1991). During the last decade, the population of recreation counties has grown almost three times as fast as non-recreation counties (20 percent vs. 7 percent, on average) (Reeder & Brown, 2005). This migration and increased private and commercial development near wildlands has increased both the complexity of fire fighting in these areas and concerns regarding the safety of people, as well as private and public property.

While federal agencies and local governments have often been viewed as the best equipped to conduct fire prevention or protection activities, there has been increasing interest in involvement of other stakeholders in addressing fire management problems in the WUI (Bright & Burtz, 2004). Both residents and recreationists are important stakeholders for resource managers and community officials to work with in

efforts of risk reduction, such as practicing defensible space around homes, burning trash responsibly, following recommended campfire use, and being watchful of other fire-prone activities (e.g., ATV use, cigarette smoking) (Vogt et al., 2006).

Research has shown that participating in outdoor recreation can expose people to specific examples of environmental management or degradation and subsequently increase their concern about such degradation on a broader scale (Bright & Porter, 2001). Pinhey and Grimes (1979) reported participants in outdoor recreation activities exhibited more concern for wildlife than non-participants. Jackson (1986) found recreation users held stronger attitudes toward protection of the resources necessary for engaging in the activity than attitudes held about more general environmental topics. Vogt et al. (2006) reported cognitive factors that influence support for fuel management approaches differed across recreation users and nonusers. Other research has found few or weak connections between wildlife recreation users and beliefs in fuel treatment approaches leading to improved wildlife conditions (Geisler et al., 1977; Van Liere & Noe, 1981).

Building on the study of Vogt et al. (2006) which surveyed residents of six Missouri counties near a national forest, this research continues with the examination of the relationship between local recreation users and beliefs that fuel treatment approaches will lead to improved wildlife conditions. Specifically, hunters, anglers, and wildlife viewers were studied as prominent recreation user types in the national forest. Resource managers also agreed that these groups can be directly impacted by fuel management applications.

2.0 METHODS

A survey was used, in part, to assess local recreation users' beliefs about three fuel management approaches (prescribed burning, mechanical fuel reduction, and defensible space ordinance) practiced in three northern Michigan counties (Crawford, Ogemaw, and Oscoda) at various levels by a federal agency (U.S. Forest Service), a state agency on state forest land (Michigan Department of Natural Resources), or homeowners on their own property or through associations. The questionnaire that was used was an adaptation of a previous questionnaire sent in 2002 to the same households. The baseline questionnaire data from homeowners that were collected in 2002 were preceded with focus group sessions held with homeowners, resource managers, and stakeholders in the Mio areas (Winter et al., 2002). The focus groups helped identify local issues and understanding by homeowners of the three fuel management approaches that formed the base for the questionnaire (Vogt et al., 2005).

The three counties where data were collected are located in or near the boundaries of Huron-Manistee National Forest (HMNF). The counties provided 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 original 2002 sample was developed with expert help by delineating high-risk areas of the three-county region using township, ranges, and sections. We obtained the tax assessment databases from each county's equalization department and extracted the property records for these high-risk areas. Thus, our sample represents specific areas of each county where homeowners and potentially flammable vegetation fuels coexist. Only owners of properties for which tax assessor records indicated the presence of a residential structure with a value of at least $25,000 were treated as part of the sampling frame (to eliminate vacant lots and hunting cabins). In all areas, owners of single-family homes and mobile homes were considered to belong to the population of interest. Due to the low population density in the study area, all homeowners meeting these criteria were included in the sample. This procedure was repeated for the 2006 sample. The high-risk area remained the same, however we increased the property value threshold to account for inflation over the 4-year period. Homeowner names were updated and parcels with new homes were added for the 2006 survey process.

The mail questionnaire was administered following Dillman's (2000) methodology. From March 27 through May 10, 2006, 2,951 households were surveyed. One hundred sixty-seven surveys were undeliverable and 1,292 surveys were completed and returned for an overall response rate of 46 percent, slightly lower than the 52 percent response rate in the 2002 survey. During data collection, many respondents sent additional letters about wildlife concerns and the protection of natural resources for their recreation activities. These letters led us to examine the relationship between recreation users and their beliefs about the outcomes of fuel treatment techniques applied near their homes and recreation areas.

3.0 RESULTS

To understand recreation rates by homeowners living in or near the national forest, the mail questionnaire asked, "Do you or others in your household recreate in the HMNF?" More than two-thirds (69 percent) of the homeowners indicated that they had recently used the HMNF for outdoor recreation: daily or weekly (25 percent of those who recreate), a couple times per month (44 percent), or a couple times per year (31 percent). The next question asked respondents to list the three most important activated they had participated in on HMNF in the past 12 months (which allowed for all seasons to be considered). Respondents self-reported many types of outdoor recreation including hunting, fishing, watching wildlife, hiking, camping, canoeing/ kayaking, and snowmobiling (Table 1).

Table 1.—Primary recreation activities in a Michigan national forest*

	Percent (n=819)
Hunting	49.3%
Fishing	46.4%
Hiking	35.5%
Canoeing/Kayaking/Boating	28.0%
Skiing	23.9%
Snowmobiling	21.7%
Camping	16.1%
Watching Wildlife	15.4%
Walking	14.5%

*Up to three activities could be offered by respondents

Table 2.—Activity levels by homeowners living in or near a Michigan national forest

	Percent of each (n=819)	Total percent by levels
One activity only		
Hunting	16%	39%
Fishing	15%	
Wildlife viewing	8%	
Two activities		
Hunting & fishing	23%	28%
Fishing & wildlife viewing	2%	
Hunting & wildlife viewing	3%	
All three activities	2%	2%
Only participated in other activities such as hiking, kayaking, camping, snowmobiling, etc.	31%	31%

Next, we recoded (i.e., dummy coding) the recreation activity data so that any respondent who listed a recreation activity was noted. A respondent could have up to three activities recorded, however, for the purposes of this analysis we focused on three recreation activities that rely on wildlife management – hunters (44 percent); anglers (41 percent); wildlife viewers (15 percent). Slightly more than one-third (39 percent) participated in only one of these three activities, 28 percent participated in two activities, 2 percent in all three activities, and 31 percent participated in other recreation activities in this national forest (Table 2).

A demographic profile of recreationists who live near or in the HMNF showed that most respondents to the overall survey were male (74 percent), most recreation users were male (82 percent), and the three recreation groups of interest were also primarily male (Table 3). Wildlife viewers had the highest proportion of females (27 percent). Most respondents were full-time area residents. Hunters were slightly more likely to be full-time residents than anglers or wildlife viewers. Anglers and wildlife viewers were more likely to be retired than to be unemployed, a homemaker, or working outside the home. For hunters, working full time was the most common employment status.

Table 3.—Demographic Profile of Selected Respondents

	All Respondents (n=1,292)	Hunters (n=404)	Anglers (n=379)	Wildlife Viewers (n=159)
Gender				
Male	74%	88%	86%	73%
Female	26%	12%	14%	27%
Residential Status				
Full-time	57%	79%	74%	74%
Seasonal	40%	21%	26%	26%
Employment Status				
Retired	51%	41%	45%	46%
Employed full-time	34%	43%	38%	40%
Self-employed	7%	8%	9%	4%
Employed part-time	4%	3%	5%	.4%
Homemaker	2%	3%	2%	3%
Unemployed	1%	1%	1%	2%

For each fuel treatment, we assessed respondents' beliefs about the likelihood that the "fuel treatment improves conditions for wildlife." The scale was anchored with "1" = Zero Likelihood, "4" = Somewhat Likely, and "7" = Certain. Across all recreation users, prescribed burning (mean on 7 pt scale=4.41) was viewed as more likely to improve wildlife conditions than mechanical fuel reduction (mean 3.98) or defensible space ordinances (mean 2.91) (Table 4).

Using regression analysis, we examined hunters', anglers' and wildlife viewers' beliefs about whether burning would improve conditions for wildlife (R^2 = .02, F=7.5, p<.001) – anglers (beta=.12, t=3.3, p<.01) and hunters (beta=.09, t=2.4, p<.05) (Table 5). The regression equations were not significant for mechanical fuel reduction (R^2 =.000, F=1.066, ns) or defensible space practices (R^2 = -.002, F=.509, ns) (Table 6 and 7) or in a MANOVA including all three fuel treatments.

Table 4.—Beliefs viewed across all recreation users

	Improved Wildlife Conditions				
	All respondents (n=1292)	All recreation users (n=797)	Hunters (n=404)	Anglers (n=379)	Wildlife viewers (n=159)
Prescribed burning	4.35	4.41	4.59	4.66	4.24
Mechanical fuel reduction	4.08	3.98	4.05	4.10	3.92
Defensible space ordinance	3.14	2.91	2.89	2.86	2.90

Table 5.—Prescribed burning improving wildlife conditions

Independent variables (n=803)	Beta	T-statistic	P
Hunting	.086	2.395	.017
Fishing	.120	3.301	.001
Wildlife viewing	-.007	-.185	.853
Adjusted R-square =.024, F=7.476, p <. 001			

Table 6.—Mechanical fuel reduction improving wildlife conditions

Independent Variables (n=799)	Beta	T-statistic	P
Hunting	.041	1.107	.269
Fishing	.036	.970	.333
Wildlife Viewing	-.012	-.344	.731
Adjusted R-square =.000, F=1.066, ns			

Table 7.—Defensible space ordinance improving wildlife conditions

Independent Variables (n=796)	Beta	T-statistic	P
Hunting	-.010	-.278	.781
Fishing	-.039	-1.064	.288
Wildlife viewing	-.016	-.444	.657
Adjusted R-square = -.002, F=.509, ns			

4.0 CONCLUSION

Homeowners who recreate in the HMNF, specifically a three-county region on the east side of the forest, viewed "prescribed burning" as more likely to improve wildlife conditions than mechanical fuel reduction or a defensible space ordinance. Prescribed burning may have been highly rated because burning can bring new vegetation that can attract deer, birds, and other popularly hunted animals thereby improving hunting opportunities. Specifically, hunters and anglers were more likely to expect prescribed burning to improve wildlife conditions than those in the nonconsumptive recreation group (wildlife viewers). This was a surprising result given that the HMNF's management plan is directed at the endangered Kirtland warbler, a prize species for birders and one that generally benefits from prescribed burning in jack pine forests. A more sizeable group of wildlife viewers, particularly one that includes tourists from outside of the area, may show a better understanding of the desired outcomes of management programs like prescribed burning. Currently, birding tours highlight the use of prescribed burning to enhance habitat areas.

The weak prediction of this simple equation, which included recreation participation and beliefs about the effects of different fuel treatment strategies on wildlife conditions, suggests there are other more predictive variables and models for explaining the relationship between participation in a local outdoor recreation activity and beliefs about achieving desired outcomes through specific forest management activities. This paper did not address other forms of involvement or participation in forest management other than recreation use. For example, homeowners are also likely to (1) hold jobs directly or indirectly related to the forest; (2) volunteer for local fire departments or other local service groups; and/or (3) visit the forest for gathering wood or foods, which are other forms of visiting or relying on the forest. It would be worthwhile to examine how these uses or involvement in a forest may influence belief outcomes for fuel treatment approaches.

5.0 CITATIONS

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