

Attitudes of Residents in the Greater Chicago Region Toward Prescribed Burns and Ecological Restoration

*Human*Dimensions
Research Program

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Abstract

A self-administered mail survey of 8,079 residents in 9 counties of the Southwestern region of Lake Michigan (6 in Illinois, 2 in northwestern Indiana, 1 in Wisconsin) was undertaken during February through April 2002 to determine residents' value orientation, attitudes toward, and knowledge of ecological restoration in tall-grass prairies and oak savannas of the region. Specific focus was given to attitudes toward prescribed burns as a management practice. A total of 1,690 (21%) completed questionnaires were received. Although the overall response rate was low, the original sample reflected an over-sampling of the 9 counties. The final response was within the 95% confidence interval for a bivariate response given the population of the region. Respondents had higher mean education levels (51% were college graduates) and income (mean was <\$60,000 year) than county averages, however these averages may be more reflective of the population of visitors to natural areas, as opposed to total population of the counties sampled. In the absence of quantitative demographic data on visitors from Chicago Wilderness sites such comparisons cannot be verified.

Prescribed burning was supported by most respondents (73%) in some (56%) or all (17%) cases, whereas 17% were unsure and 10% found prescribed burning unacceptable in some (6%) or all (4%) cases. Individuals supportive of prescribed burns were more supportive of other restoration practices and more held positive attitudes toward ecosystem restoration than those opposed to burning. Supporters perceived they had higher levels of understanding about principles of restoration and management of natural areas and were more likely to have personally observed burning and other management practices. Individuals opposed to prescribed burns were more likely to receive their information from television and radio and had less direct experience with burning and other management activities. Findings suggest emphasis for burn communications include information about risks and benefits to ecosystems from use of fire.

Introduction

The purpose of this study was to investigate public attitudes toward use of prescribed burns in restoration and management of natural areas in northeast Illinois, southeast Wisconsin, and northwest Indiana. By segmenting according to attitudes toward prescribed, specific publics were identified in order to target communication messages tailored to that group's orientation.

Prescribed burns are a necessary management practice in reducing fuel loads and removing unwanted vegetation, and are especially important in restoring tall grass prairies and oak savanna woodlands. Public attitudes toward prescribed burns have been mixed. A nationwide survey found the general public expressed divided support for prescribed burns (Manfredo et al. 1990). Other studies (see for example Smith and Clark 1994, Bright et al. 1993, Shelby and Speaker 1990) report similar results. Employing prescribed burns in urban areas offers added problems. Public beliefs about fire are deeply ingrained to perceive fire as a negative agent in an ecosystem (Taylor et al. 1986). Although public support for ecosystem restoration in the greater Chicago region is relatively strong (Barro and Bright 1998), some opposition has been noted to burning and other restoration activities (Gobster 1997). By understanding public concerns for fire application in urban regions, communication strategies can be developed to inform and educate various members of the public about the beneficial aspects of prescribed burns and manner in which burns are conducted.

Methods

Sample

Data from this study were obtained through an 8-page self-administered mail survey of 8,079 residents of Cook, DuPage, Kane, Lake, McHenry, and Will Counties, Illinois; Lake and Porter Counties, Indiana; and Kenosha County, Wisconsin conducted during February through April, 2002. The mailing list of residents was comprised of single family homeowners randomly sampled by county, with 1,000 individuals sampled from each of the 9 counties. The sample was

obtained from survey Sampling, Inc. of Fairfield, CT. Each individual in the sample was mailed a questionnaire, accompanied by a cover letter explaining the study and a stamped return-mail envelope. Nonrespondents to the first mailing were mailed a reminder postcard 14 days after the questionnaire. This procedure of mailing the questionnaire, cover letter, and return envelope followed by a postcard reminder was followed at 14-day intervals for a total of 3 complete mailings.

Questionnaire Development

The questionnaire employed in this study was developed using feedback from the first set of focus groups conducted by Dr. Barbara Willard from De Paul University, Department of Communications and also through input from members of the Burn Communications Team of the Chicago Wilderness. Questionnaire items focused on 1) residents' proximity to and visitation experience with the natural area nearest their home, 2) prior experience with restoration or management activities in terms of awareness, personally witnessing, and receiving communication about the activities, 3) self-rated knowledge of natural areas restoration and management, 4) attitudes toward prescribed burns and other restoration activities, and 5) value orientations toward natural areas. The questionnaire was pre-tested on a subsample of 200 individuals randomly selected from the complete mailing list.

Data Analysis and Stratification

Questionnaire items were coded for data entry, and analyzed using SPSS 10.0 (SPSS, Chicago, IL). Respondents were stratified into 3 groups based on their response to a 5-point scale examining level of support for use of prescribed burns as a management practice. The items asked respondents if they felt burning was "Unacceptable in all cases," "Unacceptable in some cases," "Acceptable in some cases," or "Acceptable in all cases." A neutral "Unsure" category was also provided. Respondents who viewed use of burns as unacceptable in some or

all cases were collapsed into one group classified as “Unacceptable,” those who perceived burns as “Acceptable” in some or all cases were collapsed into the “Acceptable” group. Many item responses were stratified between the “Unacceptable” and “Acceptable” groups. In some tables the “Unsure” group responses are also presented. Where differences between groups are presented, three different statistical tests are used to determine significance between the groups: Pearson’s Chi-square, Kendall’s tau-b, and One-way Analysis of Variance (ANOVA). Specific tests are identified for comparisons where findings were significant.

Results and Discussion

Response

The 3 mailings resulted in a response of 1,690 (21%) questionnaires. Whereas this is a low overall response when viewed from the total sample, it is important to note that over-sampling occurred to provide useable strata on the county level. The overall response rate is within the 95% confidence interval at +/- 3% error on a bivariate item for the total regional population. For a population of 3 million people a response of 1,064 is needed for the 95% confidence interval for a bivariate item (Salant and Dillman, 1994). Although the response received limits meaningful stratification at the county level, it does not prevent statistical significance for use of the data in the aggregate. Two hundred follow-up telephone calls were made to determine nonresponse bias. Based on results of the telephone follow-up and statements written on 90 incomplete questionnaires returned, it was determined that issue salience was the motivating factor prompting response.

Support for prescribed burning

Most respondents (73%) supported prescribed burning in some (56%) or all (17%) cases. Some respondents were unsure (17%), and fewer (10%) found prescribed burning unacceptable in some (6%) or all (4%) cases. Many of the analyses presented in this report were based on the

groupings produced by responses to this item in the questionnaire. Respondents who did not support burning in some or all cases were classified into the “Oppose” group (10%), whereas those who supported burning in some of all cases were classified into the “Support” group (73%), with the remainder in the “Unsure” group (17%).

Table 1. Level of support for prescribed burning as a management tool.

	Unacceptable in all cases (%)	Unacceptable in some cases (%)	Unsure (%)	Acceptable in some cases (%)	Acceptable in all cases (%)
Burning	4	6	17	56	17

Place of residence

As discussed previously, the relatively low overall response rate makes county comparisons difficult in a statistically significant sense, however some comparisons are warranted for purposes of identifying general tendencies. Along this line of reasoning, support and opposition for burning were examined by county (Table 2). Support for burning was highest among residents of Lake (80%), DuPage (79%), McHenry (78%), and Kane (77%) counties. Support was lowest among residents of Lake (21%) and Porter (66%) counties in Indiana, Cook County in Illinois (64%), and Kenosha County (69%) Wisconsin.

Table 2. Level of support for burning by county of residence.

County	Support (%)	Oppose (%)	Unsure (%)
Lake	80	6	14
DuPage	79	6	15
McHenry	78	9	13
Kane	77	12	11
Will	71	11	17
Cook	64	11	26
Kenosha, WI	69	12	19
Porter, IN	66	14	20
Lake, IN	21	14	65

More respondents (48%) lived between 1 and 5 miles from the natural area nearest their home than any other distance category (Table 3). Respondents who supported prescribed burns exhibited a slight tendency to live closer to the nearest natural area than those who opposed burns (88% of supporters lived 5 miles or less, compared to 78% of those opposed), however the difference was not significant.

Table 3. Distance from respondents' homes to nearest natural area. (n = 1668)

Distance	Support (%)	Oppose (%)	Total (%)
<1 mile	39	34	36
1 – 5 miles	49	44	48
6 – 10 miles	10	16	12
>10 miles	3	6	4

To determine if habitat of the natural area nearest residents' homes may be related to level of support for prescribed burns, study participants were asked to identify from a list of 4 choices the predominant habitat type of the natural area nearest their home (Table 4). Although more respondents opposed to prescribed burns lived near forested natural areas than supporters, this difference was not significant. Natural areas nearest respondents' homes are presented in Appendix A.

Table 4. Description of habitat type of natural area nearest respondents' homes (n=1411).

Area	Support (%)	Oppose (%)	Total (%)
Mostly forest	19	27	21
Mostly wetlands	16	12	15
Mostly prairie or grassland	12	11	12
Mix of different habitats	53	50	52

Visitation

Residents were asked if they had visited a natural area within the 12-month period prior to the study in order to examine experience with natural areas and familiarity with the natural area closest to their home. A majority of respondents (93%) reported visiting a natural area within the 12 months prior to the study (Table 5). Natural areas nearest their homes were visited by most (85%) individuals. No significant difference was observed in frequency of visits between supporters and those opposed to prescribed burns (Table 6).

Table 5. Natural area visitation, by burn support type. (n = 1677)

	Support (%)	Oppose (%)	Total Response (%)
Visited natural area nearest home	88	83	85
Visited another natural area	8	7	8
Did not visit any natural areas	5	10	7

Table 6. Frequency of visitation to natural area in past 12 months. (n=1418)

	Support (%)	Oppose (%)	Total (%)
Often (6 times or more)	40	35	37
Occasionally (3-5 times)	30	30	31
Rarely (1-2 times)	24	30	27
Never	6	5	5

Habitat type of natural areas most often visited was used to determine effect of habitat type on attitudes toward prescribed burns. A majority of supporters (55%) and approximately half (49%) of respondents opposed to burning visit areas of mixed habitats most often (Table 7). Natural areas most frequently visited are provided in Appendix B. There was no significant differences in sites visited between the 2 groups.

Table 7. Description of habitat type of natural area respondents visited. (n=1411)

Area	Support (%)	Oppose (%)	Total (%)
Mostly forest	29	32	29
Mostly wetlands	9	10	9
Mostly prairie	8	9	8
Mix of different habitats	55	49	54

Restoration and management of natural areas

Respondents opposed to prescribed burning reported a significantly lower awareness of burning practices (16%) than supporters (41%) (Table 8). Individuals opposed to burning had significantly lower awareness than supporters for all management activities listed, with the exception of herbicide application where awareness was low for both groups and differences were not significant. More than half of respondents (55%) in the opposed group reported they had not witnessed any of the activities mentioned. Lack of awareness about management

activities such as prescribed burning on the part of individuals opposed to burns may lead to misconceptions or erroneous assumptions about prescribed burns and lead to opposition.

Table 8. Awareness of management activities on natural areas in region.

Management Activity	Support (%)	Oppose (%)	Total (%)	χ^2
Prescribed burning	41	16	33	104.19 ^a
Planting native plants	31	14	26	46.45 ^a
Gathering native seeds	17	4	13	43.19 ^a
Shrub removal	17	5	14	31.72 ^a
Deer control	24	14	22	16.45 ^a
Tree removal	24	19	22	10.45 ^a
Applying herbicides	7	6	7	2.12
I have not witnessed any of the activities mentioned above	40	55	45	42.54 ^a

^a Both Pearson's Chi-square and Kendall's tau-b show significant differences between "Support" and "Oppose" ($\alpha=0.01$, $p<0.0001$).

Slightly more than one-quarter (27%) of all respondents reported witnessing any management activities, however activities were witnessed most often by supporters (33%) than individuals opposed (19%) to prescribed burns (Table 9). Of respondents who reported they witnessed management activities, prescribed burning was the management activity witnessed most often (48%). Prescribed burns were witnessed by 51% of those supportive of and 40% of those opposed to burning. More respondents (40%) in the group opposed to burning reportedly witnessed tree removal than those in the group supportive of burning (16%). Few respondents reported that they witnessed any of the remaining management activities. Lack of witness to other activities is likely due to the timing (for example, deer control is most often undertaken at night) or the lack of physical evidence of the activity (e.g. planting native plants and gathering seeds).

Table 9. Management activities personally witnessed by respondents.

Witnessed Activities ^a	Support (%)	Oppose (%)	Total (%)
Yes	33	19	27
No	67	81	73
<u>Which activities did you witness?</u> (percentages are of respondents who witnessed activities)	Support (%)	Oppose (%)	Total (%)
Prescribed burning	51	40	48
Tree removal	16	40	20
Planting native plants	8	3	8
Shrub removal	4	0	5
Deer control	5	3	4
Gathering native seeds	3	0	4
Applying herbicides	>1	0	>1
All of the responses listed above	3	3	3

^a Significant difference between “Support” and “Oppose” ($\chi^2 = 44.90$).

Communication

A majority (56%) of supporters of prescribed burns had received communication (written, visual, or oral) related to natural areas restoration, whereas fewer (42%) of those opposed to burning had received such communication (Table 10). Differences in communication between the two groups were significant. Most (75%) individuals supportive of restoration perceived the messages as supportive of burning, compared to those opposed to burning (66%). Newspapers were the most common media through which messages about burning were received; 42% of those supportive of burns saw messages in newspapers compared to 28% of those opposed (Table 11). Respondents opposed to burns (10%) used radio more than those supportive of burns (6%). Information available at nature centers, mailings at home, signs at the site, and personal communication were sources used by burn supporters more than those opposed to burns. Most individuals preferred to receive information related to burning via newspapers, mailings (brochures, flyers, etc.), or broadcast on television (Table 12).

Table 10. Respondents receiving burn communication messages. (n=1632)

“Have you read, seen, or heard anything about restoring natural sites in your region?”	Support (%)	Oppose (%)	Total (%)
Yes ^a	56	42	50
No	44	58	50
<u>If “Yes,” was the information:</u>	(%)	(%)	(%)
Supportive of people restoring natural sites	75	66	74
Not supportive of people restoring natural sites	25	34	26

^a Significant difference between “Support” and “Oppose” ($\chi^2 = 43.42$).

Table 11. Media for information about restoring natural sites.

Source of Information	Support (%)	Oppose (%)	Total (%)
Newspaper	42	28	37
Information at nature center	14	8	12
Mailing at my home	13	8	12
Sign at site	11	7	10
Friends/family	10	6	9
Environmental/conservation organization	10	5	8
Television	6	10	6
Staff at natural area	7	3	6
Brochure	7	2	5
Radio	6	5	5
Conservation or wildlife official	5	3	5
Flyer or poster on bulletin board, etc.	4	2	3
Neighborhood association	3	2	5
Web site	2	2	2
Phone message	>1	>1	>1
Other ^a	4	7	4

^a Other sources of information include: Community/city/village, Boy Scouts, teacher, magazine/journal, and job related correspondence.

Table 12. Preference for communication medium relating information about restoration and management activities.^a

Source of Information	Number of Responses
Newspaper	540
Mailing – brochure/newsletter/flyer	483
Television news media	141
Posting at the site	78
Web site/email	72
Radio	58
Multiple media sources	17
Community official/Conservation official-staff	16
Neighborhood friends/association	14
Road signs/billboard	8
Notice posted at library	6
Magazine/journal	2
Information from kids through the school	1

^a Little to no differences were observed between support, unsure, and opposed groups. Therefore, only total responses are presented.

Questionnaire items concerning burn communications included participants' ratings of importance for content of the messages (Table 13). Respondents rated notifying residents of proposed burns, certification of burn personnel, and communicating potential risks as extremely important items to include in future messages. Individuals opposed to burning rated burn procedure with diagrams as more important than did burn supporters. Burn supporters favored including statements about potential benefits to ecosystems in future burn communications.

Table 13. Importance of information about burns in future communications.

	Type of Support	Not Important (%)	Slightly Important (%)	Moderately Important (%)	Very Important (%)	Extremely Important (%)	ANOVA
Burn procedure (with diagram)	Support	11	13	26	32	18	F = 6.43 <i>p</i> < 0.005
	Unsure	10	9	27	35	20	
	Oppose	6	10	23	32	30	
	Total	10	12	26	32	19	
Burn procedure (without diagram)	Support	19	24	31	16	10	NS ^a
	Unsure	20	16	32	18	13	
	Oppose	16	23	23	22	16	
	Total	19	23	30	17	11	
Potential benefits for ecosystem	Support	3	6	23	43	25	F = 5.03 <i>p</i> < 0.005
	Unsure	7	9	24	35	24	
	Oppose	4	11	24	35	27	
	Total	3	7	23	41	25	
Potential benefits for people	Support	3	7	23	42	25	NS ^a
	Unsure	6	9	20	38	28	
	Oppose	2	11	19	39	30	
	Total	3	8	23	41	26	
Potential risks	Support	3	11	21	37	28	NS ^a
	Unsure	6	8	20	31	35	
	Oppose	3	9	14	28	46	
	Total	4	10	20	35	31	
Notification to nearby residents when and where burning will occur	Support	2	4	12	32	50	NS ^a
	Unsure	5	3	14	27	51	
	Oppose	2	2	9	26	61	
	Total	2	4	12	31	51	
Certification of burn personnel	Support	4	6	14	30	48	NS ^a
	Unsure	5	5	17	27	46	
	Oppose	3	7	9	23	59	
	Total	4	6	14	29	49	

^a Not significant at $\alpha = 0.05$

Knowledge of restoration practices

Study participants were asked to indicate how well they felt they were able to explain to a friend several concepts related to restoration of natural areas. Concepts were presented with a corresponding 5-point scale (1 = “Not very well” and 5 = “Very well”), with respondents selecting a position on the scale to indicate their level of ability. In every example, individuals supportive of prescribed burns exhibited a significant difference in self-reported ability than those opposed to burning (Table 14). Greater differences in ANOVA significance were observed for the concept “Why natural areas are burned” ($F = 206.43$), “Why restoration is conducted” ($F = 88.84$), and “Why some species are considered ‘invasive’” ($F = 69.55$).

As perceived understanding of the use of fire in restoration may influence attitudes toward prescribed burns, participants were asked to rate their knowledge of fire as a tool in restoration and management of natural areas. Slightly less than half (49%) of individuals who supported prescribed burns rated themselves as “Fairly knowledgeable” to “Very knowledgeable,” compared to 23% of those opposed to prescribed burns and approximately 14% of those unsure (Table 15).

Table 14. Self-reported level of ability to explain restoration concepts.

“How well would you be able to explain the following concepts to a friend?”	Type of Support	Not Very Well					Very Well	ANOVA
		(%)	(%)	(%)	(%)	(%)		
How natural areas are restored to a healthy state	Support	18	24	32	17	9	F = 47.36 <i>p</i> <0.0001	
	Unsure	45	22	22	7	4		
	Opposed	38	24	20	14	3		
	Total	25	24	29	15	8		
Methods and issues in controlling deer populations	Support	21	22	27	16	14	F = 35.73 <i>p</i> <0.0001	
	Unsure	41	20	27	7	5		
	Opposed	39	23	24	7	8		
	Total	26	22	27	14	11		
Why some species are considered “invasive”	Support	19	17	26	24	15	F = 69.55 <i>p</i> <0.0001	
	Unsure	44	21	24	8	4		
	Opposed	40	23	19	12	6		
	Total	25	18	25	20	12		
Why restoration is conducted	Support	11	14	33	30	13	F = 88.84 <i>p</i> <0.0001	
	Unsure	37	19	29	12	2		
	Opposed	28	23	31	11	8		
	Total	17	15	32	25	11		
Why natural areas are burned	Support	8	9	26	35	23	F = 206.43 <i>p</i> <0.0001	
	Unsure	40	23	25	10	3		
	Opposed	35	24	24	9	8		
	Total	16	12	26	28	18		

Table 15. Self-rated knowledge of use of fire in restoration. ^a (n=1627)

“I consider myself _____ about use of fire to restore and manage natural areas.”	Support (%)	Unsure (%)	Oppose (%)	Total (%)
Not very knowledgeable	12	51	40	22
A little knowledgeable	38	35	38	38
Fairly knowledgeable	41	13	20	34
Very knowledgeable	8	>1	3	6

^a ANOVA = ($\alpha = 0.01, p < 0.0001$).

Significant differences in importance for various reasons to conduct burns were found to exist between respondents supportive of prescribed burns and those opposed or unsure (Table 16). The reason that produced the greatest variance in response was “To promote ecosystem health.” A majority (77%) of burn supporters rated this reason “Very Important” (50%) or “Extremely Important” (27%), compared to respondents opposed to burning (27% “Very Important” and 16% “Extremely Important”). Large variances were also observed for responses to reasons “To keep vegetation from growing too dense” and “To remove non-native plants.”

Table 16. Perceived importance of reasons for burning on natural areas.

	Type of Support	Not Important (%)	Slightly Important (%)	Moderately Important (%)	Very Important (%)	Extremely Important (%)	ANOVA
To promote ecosystem health	Support	1	3	19	50	27	F = 74.85 <i>p</i> <0.0001
	Unsure	9	8	37	30	16	
	Oppose	13	15	28	27	16	
	Total	4	5	23	45	25	
To keep vegetation from growing too dense	Support	3	8	28	42	19	F = 38.23 <i>p</i> <0.0001
	Unsure	10	11	39	30	10	
	Oppose	15	18	31	23	14	
	Total	5	10	30	38	17	
To remove non-native plants	Support	6	13	27	34	19	F = 34.70 <i>p</i> <0.0001
	Unsure	15	15	43	23	4	
	Oppose	20	18	29	18	16	
	Total	9	14	30	31	17	
To restore habitat for wildlife	Support	2	6	25	46	21	F = 28.97 <i>p</i> <0.0001
	Unsure	10	9	36	31	14	
	Oppose	15	11	26	27	21	
	Total	5	7	27	42	20	
To promote species diversity	Support	7	17	37	30	9	F = 25.50 <i>p</i> <0.0001
	Unsure	15	20	46	15	4	
	Oppose	24	20	37	10	10	
	Total	10	18	39	26	8	
To promote endangered species	Support	8	15	29	33	15	F = 10.64 <i>p</i> <0.0001
	Unsure	15	18	37	20	12	
	Oppose	23	10	30	19	18	
	Total	11	15	30	30	15	

In order to understand how the terms “prescribed burns,” “controlled burns,” and “wild fire” are perceived by the general public, study participants were asked to assign certain characteristics (results or methods) to one or more of the three specific types of fire (Table 17). Several results were received from this questionnaire item. One general interpretation is that the public perceives a difference between “prescribed burns” and “controlled burns,” as opposed to viewing them as synonymous terms. In every example provided, responses differed significantly between the two terms. For example, “Ensures that fire does not get out of control” described both prescribed and controlled burns; however 75% of the total responses felt that was an attribute of controlled burns and less than half (42%) of all respondents perceived that statement as an attribute of prescribed burns. Some attributes were equally descriptive of all three types of fire (e.g. “Renew soil nutrients”), yet respondents differentiated between the types of fire when assigning the attributes.

Another result to come out of responses to this questionnaire item was the differences in perceptions of the three fire types between groups based on level of support for use of burning in restoration and management. Significant differences were found in each of the attributes by fire type across the three groups, with “Restore healthy habitat” and “Renew soil nutrients” producing the greatest difference across the groups. Differences with groups were noted as well. For example, “Ensures that fire does not get out of control” was assigned to controlled burn versus prescribed burn by more respondents for each group: 81% compared to 48% for the “Support” group; 54% to 28% for the “Unsure” group; and 59% to 24% for the “Oppose” group. Responses for the “Unsure” group were most similar to the “oppose” group across all attributes. In summary, Table 17 shows that most respondents perceived the different fire types as distinct from one another, with the “Oppose” and “Unsure” groups most alike.

Table 17. Perceived characteristics of fire types by level of support for prescribed burns.

“What do the following types of fire accomplish?”	Ensures that fire does not get out of control (%)	Restore healthy habitat (%)	Renew soil nutrients (%)	Conducted by trained personal (%)	Controls non-native species (%)
<u>Prescribed Burn</u>					
Support	48	70	63	64	55
Unsure	28	38	32	41	22
Oppose	24	36	37	35	21
Total	42	61	56	57	46
χ^2	59.39 ^b	140.27 ^b	109.35 ^b	77.75 ^b	135.20 ^b
<u>Controlled Burn</u>					
Support	81	62	62	77	48
Unsure	54	26	27	50	19
Oppose	59	32	30	49	17
Total	75	53	53	69	40
χ^2	104.89 ^b	142.53 ^b	146.93 ^b	109.41 ^b	112.64 ^b
<u>Wild Fire</u>					
Support	2	39	51	4	30
Unsure	4	16	28	5	11
Oppose	6	18	25	7	12
Total	3	33	45	4	25
χ^2	8.58 ^a	69.39 ^b	74.34 ^b	3.49 ^c	57.07 ^b

^a Significant at $\alpha = 0.05$, $p < 0.001$

^b Significant at $\alpha = 0.01$, $p < 0.0001$

^c Not significant

Attitudes toward management and health of natural areas

Attitudes toward prescribed burns tended to predict attitudes toward other restoration and management practices (Table 18). Majorities of respondents who supported prescribed burns expressed some level of support for other management practices, whereas majorities of those individuals opposed to burning were opposed to other management practices and most respondents unsure of burning were unsure of the other management practices as well. Most (76%) of those supportive of burns also supported removing shrubs, whereas a minority of those opposed to burning (33%) or unsure (28%) supported shrub removal. Spraying herbicides was supported by half (50%) of respondents supporting burns, with 17% of those opposed to burns and 14% of those unsure supportive of spraying herbicides. Three times as many respondents who supported burning were also supportive of clearing tress from prairies as were those opposed to burning (63% compared to 21%). Thinning invasive trees was also widely supported by respondents supportive of burning (84%) compared to those opposed to burning (36%) or unsure (35%). Deer control received greater support from those supportive of burning (82%), whereas a minority (31%) of respondents opposed to burning were supportive of deer control. In general, respondents who supported prescribed burning were more supportive of all other management activities presented in Table 18. Reasons given by respondents as to why they opposed the other management practices listed in Table 18 are presented in Appendix C.

Table 18. Support for management practices on natural areas.

	Type of Support	Unacceptable in all cases (%)	Unacceptable in some cases (%)	Unsure (%)	Acceptable in some cases (%)	Acceptable in all cases (%)
Removing shrubs	Support	1	6	17	63	13
	Unsure	1	7	64	22	6
	Oppose	19	25	24	30	3
	Total	3	8	25	53	11
$\chi^2 = 510.03, p < 0.0001$						
Spraying herbicides	Support	12	18	20	43	7
	Unsure	7	16	63	11	3
	Opposed	38	33	12	16	1
	Total	14	19	27	34	6
$\chi^2 = 343.38, p < 0.0001$						
Clearing trees from prairies	Support	5	13	19	49	14
	Unsure	5	13	62	17	2
	Opposed	33	29	16	20	1
	Total	8	15	26	41	10
$\chi^2 = 438.53, p < 0.0001$						
Thinning invasive trees in woodlands	Support	2	4	9	55	29
	Unsure	2	5	59	27	8
	Opposed	24	23	17	31	5
	Total	4	7	18	48	23
$\chi^2 = 665.60, p < 0.0001$						
Deer control	Support	3	5	11	52	30
	Unsure	3	4	58	27	8
	Opposed	23	21	25	23	8
	Total	6	6	20	44	24
$\chi^2 = 504.67, p < 0.0001$						

Study participants were asked to provide their attitudes toward position statements related to existence, health, and management of natural areas (Table 19). Significant differences were found between the groupings based on support for burning for 10 of the 15 items. When asked if they felt natural areas should not be managed but left alone, most (67%) of the group supportive of burning disagreed, whereas less than half (45%) of those opposed to burning disagreed with that statement. Burn supporters were also more agreeable to restoring natural areas whenever possible than those in the opposed group, and burn supporters also were more supportive of restoring the health of natural areas than the other groups. As expected, groups differed over the use of fire as a management tool, however those opposed to prescribed burning agreed that cutting any trees degraded natural areas. An important difference was also found between burn supporters and those opposed to burns over the application of herbicides, as more individuals opposed to burns also opposed use of herbicides. In comparing the importance of air quality to the presence of natural areas the most frequent response was “unsure,” indicating similar values toward natural areas as air quality. Other differences were found for responses to statements about management activities, which supported the findings presented in Table 18. Respondents, regardless of level of support for burning, were in general agreement that having natural areas in their counties was important to them, there were not enough natural areas in their counties, and natural areas do not cause problems for nearby homeowners. Most respondents (85%) also agreed that residents should be notified about burning of natural areas. Individuals supportive of prescribed burns were more supportive of other management activities and viewed health of natural areas and restoration in general more positively than respondents opposed to prescribed burning.

Table 19. Attitudes toward natural areas health and management.

	Type of Support	Strongly Disagree (%)	Disagree (%)	Unsure (%)	Agree (%)	Strongly Agree (%)	ANOVA
Natural areas should be restored wherever possible.	Support	<1	5	9	51	34	F = 5.24
	Unsure	2	3	18	49	29	<i>p</i> <0.01
	Oppose	5	7	11	43	34	
	Total	1	5	11	50	34	
Protecting air quality is more important than restoring health to natural areas.	Support	2	17	48	24	9	F = 3.28
	Unsure	2	10	50	29	10	<i>p</i> <0.05
	Oppose	5	12	44	29	10	
	Total	2	15	48	26	9	
Natural areas should not be managed, but left alone.	Support	12	55	18	13	3	F = 26.54
	Unsure	8	35	33	21	3	<i>p</i> <0.0001
	Oppose	7	38	25	20	11	
	Total	11	49	21	15	4	
Natural areas add to the quality of life in my area.	Support	<1	1	4	41	53	F = 20.30
	Unsure	<1	<1	12	53	35	<i>p</i> <0.0001
	Oppose	2	7	5	46	40	
	Total	1	2	6	43	48	
We have enough natural areas in my county.	Support	22	35	24	16	3	F = 8.52
	Unsure	12	29	38	17	4	<i>p</i> <0.0001
	Oppose	18	33	23	19	8	
	Total	20	33	27	16	4	
The health of natural areas should be restored.	Support	<1	1	9	60	30	F = 21.01
	Unsure	1	1	22	56	20	<i>p</i> <0.0001
	Oppose	2	6	14	58	20	
	Total	1	1	12	59	27	
Having natural areas in my county is important to me.	Support	0	2	3	45	50	F = 24.99
	Unsure	<1	2	12	52	34	<i>p</i> <0.0001
	Oppose	<1	4	8	52	35	
	Total	0	2	5	47	46	
Natural areas need to be restored so future generations can appreciate the natural world.	Support	<1	1	5	43	50	F = 11.70
	Unsure	1	0	14	44	41	<i>p</i> <0.0001
	Oppose	3	3	11	42	41	
	Total	1	1	7	43	47	
Natural areas cause problems for homeowners living nearby.	Support	26	40	23	9	1	F = 5.02
	Unsure	19	35	36	9	2	<i>p</i> <0.0001
	Oppose	29	39	21	9	3	
	Total	25	39	25	9	1	

Table 19 continued next page

Table 19. (Continued) Attitudes toward natural areas health and management.

	Type of Support	Strongly Disagree (%)	Disagree (%)	Unsure (%)	Agree (%)	Strongly Agree (%)	ANOVA
Fire is a useful tool in maintaining natural areas.	Support	<1	2	22	60	16	F = 238.07 <i>p</i> <0.0001
	Unsure	1	5	67	26	1	
	Oppose	13	25	41	19	3	
	Total	2	5	31	50	12	
Cutting any trees degrades natural areas.	Support	9	52	25	11	4	F = 57.90 <i>p</i> <0.0001
	Unsure	2	24	53	16	5	
	Oppose	2	27	30	29	11	
	Total	7	44	30	14	5	
Preserve areas allow me to experience natural ecosystems.	Support	<1	1	7	63	28	F = 18.64 <i>p</i> <0.0001
	Unsure	<1	1	20	62	18	
	Oppose	<1	5	13	57	24	
	Total	<1	2	10	62	26	
Residents should be notified of burning in natural areas.	Support	1	5	9	52	34	NS ^a
	Unsure	1	2	16	50	32	
	Oppose	2	2	5	49	42	
	Total	1	4	10	51	34	
I feel applying herbicides for weeds damages natural areas.	Support	3	20	42	23	12	F = 11.76 <i>p</i> <0.0001
	Unsure	3	8	54	25	10	
	Oppose	3	14	24	37	22	
	Total	3	17	43	25	12	
Managing natural areas causes problems where I live.	Support	25	51	21	2	1	F = 26.68 <i>p</i> <0.0001
	Unsure	15	37	45	2	2	
	Oppose	17	41	33	5	3	
	Total	22	48	26	3	1	

^a Not significant at $\alpha = 0.05$

Value orientations differed by level of support for prescribed burns among 9 of 12 items (Table 20). Participants were asked to respond to the statement “Natural areas are important to me because they...” by indicating the level of personal importance placed on 12 completing statements. Where significant variance was found to exist the difference was between burn supporters and those either opposed to burns or unsure of their support. Greatest differences were found for “...Create a place for me to escape the urban world,” “...Provide places for people to experience nature,” and “...Provide open space.” No significant differences were found for items related to spiritual aspects of natural areas, nor creating pristine, pre-European settlement conditions or providing places for recreation.

Table 20. Value orientations toward natural areas.

Natural areas are important to me because they....	Type of Support	Not Important (%)	Slightly Important (%)	Moderately Important (%)	Very Important (%)	Extremely Important (%)	ANOVA
Create wildlife habitat.	Support	<1	3	16	44	37	F = 11.0 <i>p</i> <0.0001
	Unsure	3	6	21	41	29	
	Oppose	2	3	25	34	36	
	Total	1	4	18	43	35	
Protect threatened or endangered species.	Support	<1	4	13	40	42	F = 8.56 <i>p</i> <0.0001
	Unsure	3	5	20	37	34	
	Oppose	1	3	21	33	41	
	Total	1	4	15	39	40	
Are a legacy for future generations.	Support	<1	2	10	42	46	F = 16.37 <i>p</i> <0.0001
	Unsure	3	3	16	45	33	
	Oppose	5	5	12	38	41	
	Total	1	3	11	42	43	
Are part of God’s creation.	Support	8	6	14	32	40	NS ^a
	Unsure	7	4	17	33	39	
	Oppose	9	3	15	25	47	
	Total	8	5	15	32	40	
Create a pristine area as it was before the area was settled.	Support	4	10	28	34	25	NS ^a
	Unsure	3	12	25	36	23	
	Oppose	7	10	29	31	23	
	Total	4	10	27	34	24	

^a Not significant at $\alpha = 0.05$

Table 20. (Continued) Value orientations toward natural areas.

Natural areas are important to me because they....	Type of Support	Not Important (%)	Slightly Important (%)	Moderately Important (%)	Very Important (%)	Extremely Important (%)	ANOVA
Provide places for recreation.	Support	2	8	23	41	27	NS ^a
	Unsure	4	7	26	42	22	
	Oppose	7	11	24	38	21	
	Total	3	8	24	41	25	
Provide open space.	Support	<1	4	15	47	34	F = 18.94 <i>p</i> <0.0001
	Unsure	2	6	24	42	26	
	Oppose	6	8	19	41	26	
	Total	2	4	17	46	32	
Allow for biodiversity.	Support	<1	6	19	41	34	F = 17.95 <i>p</i> <0.0001
	Unsure	4	7	28	42	19	
	Oppose	2	9	28	35	26	
	Total	1	6	21	41	30	
Create a place for me to escape the urban world.	Support	3	7	19	35	37	F = 22.09 <i>p</i> <0.0001
	Unsure	6	10	25	32	26	
	Oppose	13	7	27	27	27	
	Total	4	7	21	34	34	
Provide places for people to experience nature.	Support	<1	2	11	45	41	F = 19.15 <i>p</i> <0.0001
	Unsure	2	6	18	42	32	
	Oppose	1	8	20	37	34	
	Total	<1	3	13	44	39	
Create beauty in the urban landscape.	Support	1	2	13	41	42	F = 11.82 <i>p</i> <0.0001
	Unsure	2	4	20	45	29	
	Oppose	3	6	18	34	39	
	Total	1	3	15	41	40	
Are part of our American heritage.	Support	2	4	14	37	42	F = 7.47 <i>p</i> <0.005
	Unsure	3	5	19	43	31	
	Oppose	5	8	17	34	36	
	Total	3	5	15	38	40	

^a Not significant at $\alpha = 0.05$

Perceptions of risks associated with prescribed burns

Perceived risks of health or property damage, or to wildlife resulting from prescribed burns differed significantly between groups based on their support for burning as a management tool. As expected, the groups opposed to burning perceived the greatest risks in all categories provided (Table 21). Greatest difference was in response to fire damage to ecosystems: 18% of those opposed to burning felt fire posed a severe risk for ecosystem damage, compared to 1/6

(3%) as many respondents who supported burning. Other items that produced large differences in perceived risks were damage to the appearance of natural areas, fire injuring wildlife, and health threats from smoke.

Table 21. Perception of risk from using fire as a management tool.

	Type of Support	No Threat (%)	Slight Threat (%)	Moderate Threat (%)	Severe Threat (%)	ANOVA
Health threat from smoke	Support	13	51	30	6	F = 48.56 <i>p</i> <0.0001
	Unsure	10	32	41	17	
	Oppose	6	28	39	28	
	Total	12	45	33	10	
Reduced visibility on highways	Support	9	49	32	9	F = 18.76 <i>p</i> <0.0001
	Unsure	6	40	37	17	
	Oppose	7	32	36	24	
	Total	9	46	33	12	
Fire escaping from natural area damaging nearby private property	Support	9	54	28	9	F = 46.60 <i>p</i> <0.0001
	Unsure	6	38	36	21	
	Oppose	3	33	31	34	
	Total	8	49	30	13	
Damage to ecosystem	Support	38	48	11	3	F = 102.38 <i>p</i> <0.0001
	Unsure	17	45	27	11	
	Oppose	11	35	37	18	
	Total	32	46	16	5	
Fire injuring wildlife	Support	11	54	27	9	F = 81.54 <i>p</i> <0.0001
	Unsure	6	36	29	28	
	Oppose	1	24	36	39	
	Total	9	48	28	15	
Damage to appearance of natural area	Support	29	44	23	5	F = 89.32 <i>p</i> <0.0001
	Unsure	10	38	34	19	
	Oppose	8	27	37	28	
	Total	24	41	26	9	
Reduced air quality from smoke	Support	14	50	27	9	F = 59.57 <i>p</i> <0.0001
	Unsure	9	36	32	23	
	Oppose	6	22	36	36	
	Total	13	45	29	14	
Damage to favored plants	Support	17	49	28	5	F = 66.32 <i>p</i> <0.0001
	Unsure	8	34	40	18	
	Oppose	3	31	40	26	
	Total	15	45	31	9	

Socio-demographic characteristics

Respondents did not vary significantly across the 3 burn support groups. (Only number of conservation organizations was slightly significant. Burn supporters belonged to an average of 0.53 organizations, whereas those opposed to burning belonged to 0.48 organizations. This difference, although statistically significant, has little practical significance). Therefore socio-demographic characteristics presented here are not separated by groups.

Most respondents (61%) were male. The higher proportion of males to females (39%) was likely due to the use of single family dwellings as the criteria for sampling, as a majority of homes are listed under the male head of household, where applicable. Average age among respondents was 52 years. The most frequent responses came from college graduates (Table 22). The proportion (51%) of graduates from college or professional schools who responded to the survey was higher than the proportion of graduates in the populations of the counties sampled. Higher education level of respondents suggests that, based on education alone, the respondents did not reflect the population of the general public at large.

Table 22. Highest level of education completed. (n = 1610)

Level	Percent Response
Some high school	2
High school	16
Trade or technical school	8
Some college	23
College graduate	30
Graduate or professional degree	21

Mean and median total annual household income reported by respondents was more than \$60,000 (Table 23). The most frequent response (mode) was \$100,000 or more. Mean income for the 9 counties in the study was approximately \$52,000 (U.S. Census Bureau, 2000), with average income highest in Lake and DuPage Counties, Illinois (\$63,354 and \$62,825,

respectively) and lowest in Cook County, Illinois (\$40,181) and Lake County, Indiana (\$38,205). Total annual income reported from study participants was higher than combined average for the 9 county study region.

Table 23. Total (gross) household income. (n = 1351)

Income	Percent Response
Less than 20,000	5
\$20,000 to \$39,999	14
\$40,000 to \$59,999	21
\$60,000 to \$79,999	21
\$80,000 to \$99,999	15
\$100,000 or more	24

Respondents had a mean occupancy of 16 years in their current home. Most individuals (96%) owned their home. A majority of respondents (75%) lived in Illinois, 9% lived in Wisconsin, and 16% lived in Indiana (Table 24). A majority of people (57%) have lived in their current state all of their lives, whereas 43% have moved to their current state of residence from another state (Appendix D).

Table 24. County of residence.

County	Number of Respondents	County	Number of Respondents ^a
DuPage, IL	240	Porter, IN	144
Lake, IL	226	Lake, IN	126
McHenry, IL	217	DeKalb, IL ^b	1
Cook, IL	199	Kendall, IL ^b	2
Kane, IL	196	Grundy, IL ^b	1
Will, IL	192	Jasper, IL ^b	1
Kenosha, WI	144	Vermilion, IL ^b	1

^a Includes one missing response

^b 6 people have moved from original 9 counties surveyed.

No significant differences existed in conservation and environmental organizational membership between burn supporters and those opposed to burning (Appendix E). Significant differences (ANOVA, $\alpha = 0.05$) existed between the two groups for 14 of 26 types of recreation listed on the questionnaire (Appendix F). Participation was higher for burn supporters in each category where differences were found.

Conclusions

Public perceptions and understanding of the term “prescribed burns” is mixed. Based on the findings of this study, members of the public perceived “prescribed burns” and “controlled burns” to be separate from one another. Less confusion exists concerning the term “wild fire.” More effort may be needed to educate the public of the characteristics of prescribed burns (e.g. controlled applications, specific conditions, trained personnel) and that the terms “prescribed burns” and “controlled burns” are synonymous with one another. Furthermore, results of this study suggest that public concerns over safety should be addressed using both terms in order to emphasize the fact that, regardless of terminology, safety is paramount.

Prescribed burning was fairly well supported by respondents in this study. Slightly less than three-quarters of respondents supported prescribed burning in at least some cases, and more individuals supporting burning in all cases than total opposition combined. The greatest differences between those supportive and those opposed to prescribed burns was found in knowledge of restoration practices and management of natural areas, as well as experience with burns and other restoration activities. Supporters observed burns more often and were more familiar with other management activities. Moreover, burn supporters were more supportive of other restoration practices in general than were those opposed to burning. Individuals opposed to burning were more supportive of “leave it alone” attitude statements and were more likely to see other restoration or management practices (e.g. use of herbicides, removing trees or shrubs) as degrading natural areas.

Respondents supportive of prescribed burns received more communications (read, seen, or heard) about prescribed burns than those opposed to burns, and perceived the messages to be positive to a greater extent than respondents opposed to burning. Types of communication media suggest those opposed to burns relied more on broadcast media than supporters, who tended to receive communications via print media and social networks. No difference existed between the two groups in terms of preferred media for communications about future management and restoration activities. Communication media most preferred for future messages were newspapers, mailings (e.g. brochures, newsletters, flyers), and television. Few differences between the support and oppose groups were found in ratings of importance for communicating future burning activities. Those messages that stressed safety and benefits to the ecosystem were deemed most important by respondents.

In conclusion, this study found a core of support for natural areas restoration exists in the greater Chicago region of Southwestern Lake Michigan. These residents visit natural areas in their region on a fairly regular basis and perceive themselves to be fairly knowledgeable about restoration activities and management of natural areas. Their values are positively oriented toward natural areas and they possess attitudes that favor restoration and management of natural areas, including prescribed burns. For those individuals opposed to prescribed burns, general understanding of ecosystem restoration and management of natural areas appears to be lacking. Whether information directed toward the principles of restoration and reasons for conducting management activities would serve to educate and enlighten these individuals or that their value orientations predispose them to reject such messages is uncertain without further research. Findings from this study suggest great differences in value orientations and attitudes between supporters and those opposed to ecosystem restoration and management do not exist, and that information on restoration and management could influence attitudes on prescribed burns.

Appendix A. Natural areas nearest respondents' homes.

Hawthorn Hollow	Marengo Ridge
Churchhill Woods Forest Preserve Glen Ellyn IL	Coon Creek
Cook County Forest Preserve	Moraine Hills State Park -WI
Arrowhead Lake	Fel Pro - McHenry County
Little Red School House	Lake In The Hills State Park
Pioneer Woods	Naper Prairie - Naperville IL
Wampum	Tamper Lake
Wetlands/Reclamation Area/Parkerten	Thorn Creek Preserve
Schiller Woods	Railroad Access land
Baker's lake - Barrington IL	Plum Grove Forest Preserve
Pioneer Park - Naperville IL	Dragon Lake Forest Preserve
McDowell Woods Forest Preserve - DuPage Co.	Rock Run/Rock Lake Preserve
Waterfall Glenn	Arsenal Forest Preserve
Songbird Slough	Joliet Botanical Gardens
Lincoln Marsh	McKinley Woods
Pratt/Wayne Woods	Lincoln Way Trail
Springbrook Prairie Forest Preserve	Hickory Creek Preserve
Danada Forest Preserve	Island Prairie Wetlands-Frankfort
Salt Creek /Forest Preserve	Dellwood Park
Lyman Woods	Messinger Woods-Bellwood pk area
IL Prairie Path	Bong Recreation Area State Park
Army Trail Nature Center	Chiwaukee Prairie WI
Bloomington Roselle IL Wetland Nature Area	Petrifying Springs WI
Spring Creek Reservoir	Central Park Wetlands
Rocky Glen	Thatcher Woods
Garfield Farm	North Park Nature Center
LeRoy Forest Preserve	Lake Michigan-National lakeshore
Fox Valley River	Madison Walking Path
Jones Woods	Deer Grove Forest Preserve
Oakhurst Forest Preserve - Aurora IL	Crabtree Nature Center
Fermilab Prairie	Palatine Forest Preserve
Burnridge Forest Preserve	Emily Oaks -Skokie
Plato Center Forest Preserve	SpringValley Nature Preserve
Blackhawk Forest Preserve	Herrick Lake Forest Preserve
Prairie Crossing/Prairie Path	Wabonsee Park/Lake
Daniel Wright Woods Forest Preserve	Forest Glen Preserve
Lake County Forest Preserve	Camp Logan
McDonalds Woods Forest Preserve	Beemer Woods - May's Lake
LeRoy Woods	Fabayan Forest Preserve
Reed Turner Woodlands	Kane County Forest Preserve
Grant Woods Forest Preserve	Nelson Lake Marsh
Lyons Woods Forest Preserve	Tekewitha Forest Preserve
Half Day Park District Woods	Tyler Creek Forest Preserve
VanPatton Woods	Cedar Lake
Ryerson Woods	LaSalle Fish & Game Area
Woodstock	Oak Ridge Prairie Park
Wonder Lake	Deep River Park

Sunset Farms
Indiana Dunes State Park
Rogers - Lakewood Park
Funk Park HPPD
Kankakee River State Park/Marsh
Vernon Park
Volo Bog
Bristol Woods
Pilcher Park - New Lenox IL
Des Plaines Conservation Area
Monee Reservoir
Green Valley Forest Preserve - Woodridge
Exner Marsh
Gentry Ridge Conservation Area
Oakwood Hills FEN
Moline State Park
Rush Creek Conservation Area
Glacial Ridge State Park
Chain O'Lakes State Park
McHenry Cnty Conservation Area/McHenry Dam
Chicago River
IL Beach State Park
Raviria Woods Sub
Cuba Marsh
Wicklow Villag3
Independence Grove
LF Openlands McCormick Ravine
Carol Beach - Kenosha WI
Lake George
Carl's or Coales Bog
Wauhob Lake
Black Oak
Oak Forest
Goodenow Grove
Old School Forest Preserve
Heller Nature Center
Penny Road Forest Preserve
Hawk Hollow Forest Preserve
Iroquois Hunting Area
LaBaugh Woods
Bemis Woods
Fullersburg Forest Preserve
Blackwell Forest Preserve
Peck Farms
Red Oak
Blackburn Marsh
Millcreek
Binnie Marsh

Butternut Forest Preserve
Rock Cut State Park
The Hollows Conservation District
Lake County State Park
DuPage River/Forest Preserve
SW Forest Preserve
Chicago Park District Park - River Forest IL
Morton Arboretum
Argonne National LAB
Yorkshire Woods
Culberwood Forest Preserve
Griffith Nature Preserve
Race Way Woods
Busse Woods
Stickney Run
Grand Kankakee Marsh
Arie Crown Forest Preserve
Gibson Woods
Ottawa
Catherine Woods
Grave Mill
Meacham Forest Preserve
Berkeley Prairie
Ryders Woods
Maple Grove Forest Preserve
Bliss Woods
Cornerstone Lake & Prairie Areas
Morengo Ridge Conservation Area
Harrison Benwell
Chellberg Farm
Crystal Lake
Silver Springs Lake Park
Flint Lake
Pringle Nature Center
Otter Creek
Somme Woods
Wolf Lake
Trout Park Nature Preserve
Buffalo Grove Creek
Fox Lake State Park
Trailside Museum and Forest Preserve
Wooddale Forest Preserve
St Charles River Walk Area
Center Lake
Larsen Park
Swift Dog Park
Kenosha City Park
Kishwaukee River

Liberty Prairie Forest Preserve	Hooker Lake
Veterans Acres	Blackberry Forest Preserve
Will County Forest Preserve	Ned Brown Forest Preserve
Hoosier Prairie	Jericho Lake
Little Calumet River	Holy Hill
Open Lands	Abbott Park
Valparaiso Conservation Club	Chicago Botanical Gardens
Old Plank Rd Trail	Bode Lake Forest Preserve
The Shrine	Willow Brook Wildlife Center
Hidden Lakes	Lombard Park
Harbor Prairie	Gilbert Park
Schaumburg Preserve	Thunderbird Woods
Lake Dalcarlia	Wildflower
Izaak Walton Preserve	Sauk Trail Forest Preserve
Barbara Key Fen	Deer Creek
Aetena Park	The Rookery
Skokie Lagoons	I & M Canal
Grove of Glenview	Hammel Woods
Mallard Lake Forest Preserve	Dunes - West Beach
Gilman Trail	Calumet River
Hampshire Forest Preserve	Duneland National Park
Lakewood Forest Preserve	Sand Creek
Wagner Forest Preserve	Lake Anderson
Grays Lake	Pleasant Prairie
Carnbury Lake Wetland	Sand Ridge Nature Center
North Point Marina	Yankee Woods
McCullom Lake	Petersen Park Nature Center
Sterns Woods	Schulenberg Prairie
Coral Woods	Highland Park Nature Trail
Prime County Wetlands	Eastan Park
Douglas Park	Turnbull Woods
Dwight Perkins	Wayne Woods
Harms Woods	Oak Brook Terrace Park
Raccoon Grove	Hammond Woods
Paul Wolfe Forest Preserve	Lemon Lake
Rollin's - Savanna IL	Eggers Woods
Midewin National Tallgrass Prairie	Ferson Creek Fen
Lake of the Woods - Shorewood IL	Wadworth Wetlands
Isle A La Cache	Kickapoo State Park
Lake in the Hills - FEN	New Munster
Lake Renwick	Shabbona Lake
Kingbury	Del Webb Wetlands
Lake Louise	Stoney Run
Jasper Pulaski Fish and Wildlife Area	Higgonbotham Woods
Long Lake	Boone Creek
McCormick Nature Preserve	Fern Cliff Park

Merrit Prairie
Elburn Forest Preserve
May Wyatts Commons
Ryans Woods
Shubert Woods
Milwaukee Ave Forest Preserve
Hickory Nut Grove Conservation Area
River Oaks Forest Preserve
Poplar Creek
Virgil Gilman Nature Trail

Andrea Park
Dan Ryan Woods
Greenbelt Forest Preserve
Imagination Glen
Sterling Lake
Lake Arlington
Goose Lake
Gateway Wetland
Swallow Cliff Forest Preserve
Orland Park Forest Preserve
Wright Woods Forest Preserve

Appendix B. Natural areas respondents reported visiting most often.

Morton Arboretum	Fox River
Busse Woods Forest Preserve	Shawnee National Forest
Tampier Lake	Indiana National Lake Shore
Little Red School House	Kimball Hills Subdivision
IL Beach State Park - Zion IL	Gibson Woods
Crab Tree Nature Center	Turkey Run
Green Valley - Lisle IL	Indiana Dunes State Park
Herrick Lake Forest Preserve	Bong Recreation Area
Danada Forest Preserve	Nicolet Forest Preserve
Pratt Wayne Woods Forest Preserve	Chiwaukee Prairie
Blackwell Forest Preserve	Brighten Woods
Meacham Addition - Maple Lake Forest Preserve	Chain of Lakes State Park
Waterfall Glenn	Lake Renwick
Fullersburg Woods Forest Preserve	Exner Marsh
Kankakee Woods State Park	Morraine Hills State Park
Jones Woods	Fox Lake
Fabyan Forest Preserve	Rush Creek Conservation Area - Harvard IL
Starved Rock State Park	Jasper City Conservation Area
Oakhurst Forest Preserve	Glacial Ridge Park Forest Preserve - Richmond IL
Red Oak	Green Bay Trail
Long Grove Forest Preserve	Liberty Prairie Conservancy
Hampshire Forest Preserve	Lake Michigan National Lakeshore Dunes
Lake -Le-Aqua	Daniel Wright Woods Forest Preserve
Needham Woods	Mount Baldy
Volo Bog State Nature Area	Howes Prairie
Old School Forest Preserve	Palasades Area - Savanna IL
Liberty Township Open Space	Sand Ridge Nature Center - Calcumet City IL
Chicago Botanic Gardens	Lockport Prairie
Lake Geneva - WI	Willow Slough (Jasper-Pulaski)
Rock Cut State Park	Ogden Dunes Area
Goodenow Grove	Emily Oaks Nature Center
IL Michigan Towpath Canal	Monee Wildlife Area
Will Cnty Forest Preserve	Raccoon Grove
Bong Nature Site	North Point
Pringle Park in Bristol	Lakewood FD
Hollows	Deep River Park/Deep Quarrey Area
Palos Area Preserve	LeRoy Forest Preserve
Thorn Creek Preserve	DesPlaines Conservation
Cook Cnty Forest Preserve	Schiller Woods
North Park Nature Center	Ottawa Trail Woods
Oak Forest Area Adjoining Forest National Golf Course	Max McGraw Wildlife
Margaret Reimer Reservoir	Wildlife Refuge Amberg WI
Caldwell Woods	Eaglebrook Subdivision
Dee Woods	Nelson Lake Forest Preserve
Park Ridge Native Center	Van Patton Woods
Heller Nature Center	Grant Preserve
Lyman Woods	Smokey Mountains
Shabonnah State Park	McDonald Preserve
DuPage County Forest Preserve	John J Duffy Forest Preserve

Maple Grove
McDowell Forest Preserve
Kishwaukee River
Sterling
VanHorn Woods - Hickory Creek
National Lakeshore
Kettle Marine Park
Horicon Marsh
Hot Springs - AR
Isaak Walton - Homewood
Grave Mill
Veterans Acres - Crystal Lake IL
Pilcher Park
Forsythe Woods
Blackberry Woods
Lemon Lake County Park
Jergenson Woods
Springbrook Forest Preserve
Harms Woods
Silver Springs Lake Park
Independence Grove
Midewin National Tallgrass Prairie
Big Slough
Blackhawk Woods Forest Preserve
Freeman Kame Forest Preserve
Green River
Lake County Forest Preserve
Cotton Creek Marsh
Bemis Woods
Sterns Woods
DuPage Prairie
Benedict Prairie
Mallard Lake Forest Preserve
Grand Kankakee Marsh
Porter County Wildlife Preserve
McHenry County Conservation Park Dist.
Ragsdale
Kunde's Woods
Wild Cat Mountain
Paul Wolf Forest Preserve
West Branch Forest Preserve
Mays Lake
Marsailles Fish & Wildlife Area
Hickory Grove
Lake Andrea Wetland Area
Harrison Park
Beck's Woods
Wisconsin Dells
Petrifying Springs
Hammet Woods
St Germain WI
Camp Sagawan
Panfish Park
Governor Dodge State Park WI
Mississippi State Park Sananna IL
Philppls Park
Johnson's Forest Preserve
Rosewood Beach
Old Planek Trail
Indian Prairie
Pine Woods
Door County WI
Knock Knoll Forest Preserve
I & M Canal
Dellwood Park
Tippicanoe State Park
Camp Lake
Forest Preserve National
Pulaski Woods
Geneva Park
Highland Park Nature Trail
Deer Grove Forest Preserve
Cuba Marsh
Loden Miller
Sweet Woods
Rogers Park
Russell Road
Koontz Lake
Bieker Woods
Third Lake IL
Oak Ridge Prairie
Rutland Forest Preserve
Lake in the Hills - FEN
Wolf Lake
Fernwood
Turtlehead Lake
Devils Lake
Naperville River Walk
White Lake WI
Swallow Cliff
Warren Dunes MI
Thatcher Woods
Carl Sandberg Area
Ryerson Woods
Wadsworth Prairie
Bode Lake
Lake Tampier Forest Preserve
Channahon State Park

Butler Forest Preserve
Thornton Woods
Ferson Creek
Bluff City - FEN
Fermilab
Sagauaw
Palatine Forest Preserve
Marengo Ridge
Cricket Creek
Lake Etta

Jackson Park
Cosley Zoo - Dupage County
Triple R Ranch
Bristol Woods Park
Cowls Bog
Prairie Path Trail
McKinnley Woods
Chelberg Farm
Potato Creek State Park
North Creek Meadow

Appendix C. Reasons for declaring management practice “unacceptable.”

Reason	Number of Responses
Contamination of water resources – poisons – keep toxin out/health hazard/destructive to all wildlife/prefer other methods than using herbicides.	166
You’re interfering with nature/natural means leave it alone/spraying and thinning is contrary to natural environmental change/negative effect on natural area.	162
We need to preserve more trees/trees help out our ecosystem/natural way to get oxygen into the air and good to take out pollution/trees are scarce/don't like to see woodlands removed.	60
Pollutes the air we breath/pollutes environment/public safety concerns.	55
Like seeing deer in natural habitat/we enjoy the beauty of the trees and wildlife. I can't see a situation where it would be necessary for these practices.	20
Shrubs provide cover and habitat/shrubs may prevent soil erosion/burning may destroy untargeted species/burning can be harmful to surrounding areas.	19
Need further information as to why it's needed/depends on method.	15
Danger of fire getting out of hand/burning would be a hazard.	11
Prefer restraints/only clean up fallen trees.	10
In some cases it is necessary to protect and improve/only agree with spraying for some insects like mosquitoes.	8
Waste of money/seems unnecessary and extreme.	2

Appendix D. Percentage of respondents moved to current state and state of former residence.

“Have you lived in your state
all of your life?”

	Percent Response
Yes	57
No	43

If “No,” in what state did you live before moving?

<u>State</u>	<u>Number of Respondents</u>	<u>State</u>	<u>Number of Respondents</u>
Illinois	114	Washington	5
Wisconsin	68	Mississippi	4
Michigan	47	Nebraska	4
Indiana	36	Oklahoma	4
California	31	Arkansas	3
New York	31	Massachusetts	3
Ohio	31	North Dakota	3
Minnesota	29	Louisiana	2
Texas	21	Rhode Island	2
Iowa	20	South Carolina	2
Missouri	18	South Dakota	2
Pennsylvania	18	Utah	2
Florida	17	Alaska	1
Colorado	15	Delaware	1
Arizona	14	Idaho	1
New Jersey	10	Maine	1
Kentucky	9	Montana	1
Maryland	8	Nevada	1
Alabama	7	New Hampshire	1
Tennessee	7	Oregon	1
North Carolina	6	West Virginia	1
Connecticut	5	Wyoming	1
Hawaii	5	Mexico	8
Georgia	5	Canada	5
Kansas	5	Other Countries	21
Virginia	5		

Appendix E. Conservation and environmental organization membership reported by respondents

Organization	Number of Respondents	Organization	Number of Respondents
Brookfield Zoo	145	Ducks Unlimited	58
National Wildlife Federation	116	Shedd Aquarium	53
The Nature Conservancy	99	Sierra Club	50
World Wildlife Fund	90	Defenders of Wildlife	30
Field Museum of Natural History	72	Chicago Wilderness	20
National Audubon Society	72	Environmental Defense Fund	12
Chicago Botanical Garden	64	Other	122

Appendix F. Recreational activities reported by respondents.

Activity	Number of Respondents	Activity	Number of Respondents
Gardening ^a	945	Snow Skiing ^a	255
Running/walking	943	Hunting ^a	228
Visiting Historical Sites ^a	852	Other Volunteering	202
Visiting Nature Preserves ^a	831	Horseback Riding	169
Fishing ^a	718	Tennis	162
Hiking ^a	670	Water Skiing	154
Visiting museums	616	Sport Shooting ^a	153
Camping ^a	584	In-line Skating	149
Boating/Canoeing ^a	578	Mushroom Hunting	125
Cycling ^a	569	Snowmobiling	100
Golfing	500	ATV Riding	95
Bird Watching ^a	447	Volunteering at Natural Areas ^a	45
Dog walking/Training ^a	441	Other	71
Photography	387		

^a ANOVA significant differences exist at ($\alpha = 0.05$)

Urban Natural Areas Survey

ALL RESPONSES ARE CONFIDENTIAL
THANK YOU FOR YOUR COOPERATION!

Postage-paid return envelope provided

The Chicago Wilderness
and the
Illinois Natural History Survey

Please take 15 minutes of your time to complete this questionnaire. Your responses will tell us more about natural areas and how you feel about important issues dealing with their preservation.

Section 1. Natural Areas Near Your Home. Please tell us about natural areas found near where you live. “Natural Areas” refers to Forest Preserves, Nature Reserves, lakes, rivers, wetlands and other park or open areas kept in a “natural state.” These areas **do not** include playing fields, parks, or open areas that are mowed and “manicured.”

1. How close is the nearest natural area to your home? Please check one response.

- _____ 1) less than 1 mile _____ 3) 6 - 10 miles
 _____ 2) 1 - 5 miles _____ 4) more than 10 miles

2. Have you ever visited the natural area nearest your home?

- _____ Yes
 _____ No, but I visit another natural area (Please go to **question 4**)
 _____ I do not visit any natural areas (Please go to **Section 2**)

2a. How often have you visited the area mentioned in question 2 in the past 12 months? Please check one response.

- _____ 1) often (6 times or more) _____ 3) rarely (1-2 times)
 _____ 2) occasionally (3-5 times) _____ 4) never

3. Which of the following **BEST** describes the natural area **nearest your home**? Please check one response.

- _____ 1) mostly forest _____ 3) mostly prairie or grassland
 _____ 2) mostly wetlands _____ 4) mix of different habitats

3a. Please give the name of the natural area nearest your home: _____

4. Which of the following **BEST** describes the natural area **you visit (if different from the site in question 3)**? Please check one response. (If you visit more than one, please describe the one you **visit most often**).

- _____ 1) mostly forest _____ 3) mostly prairie or grassland
 _____ 2) mostly wetlands _____ 4) mix of different habitats

4a. Please give the name of the natural area you visit: _____

Section 2. Restoration and Management of Natural Areas. Please answer the following questions about how you feel natural areas should be managed. These questions refer to natural areas throughout your region.

1. Are you aware of any of the following management activities on natural areas in your region? Please check all that apply.

- _____ tree removal _____ shrub removal _____ planting native plants
 _____ applying herbicides _____ gathering native seeds _____ prescribed burning
 _____ deer control _____ I have not witnessed any of the activities mentioned above

2. Have you personally witnessed any of the activities listed in **question 1**?

_____ Yes (please go to **question 2a**)

_____ No (Please go to **question 3**)

2a. Which activities did you witness? (Please identify): _____

3. Have you read, seen, or heard anything about restoring natural sites in your region?

_____ Yes (Please go to **question 3a**)

_____ No (Please go to **question 4**)

3a. If “Yes,” was the information:

_____ supportive of people restoring natural sites

_____ not supportive of people restoring natural sites

3b. If “Yes,” how did you receive this information? Please check all that apply.

_____ newspaper

_____ television

_____ radio

_____ staff at natural area

_____ information at nature center

_____ phone message

_____ sign at site

_____ conservation or wildlife official

_____ friends/family

_____ neighborhood association

_____ brochure

_____ environmental/conservation organization

_____ mailing at my home

_____ web site

_____ flyer or poster on bulletin board, etc.

_____ other (Please identify): _____

4. In the future, how would you prefer to hear about restoration and management activities?

5. How well would you be able to explain the following concepts to a friend? Please circle the number that matches your response.

	Not Very well				Very well
How natural areas are restored to a healthy state	1	2	3	4	5
Methods and issues in controlling deer populations	1	2	3	4	5
Why some species are considered “invasive”	1	2	3	4	5
Why restoration is conducted	1	2	3	4	5
Why natural areas are burned	1	2	3	4	5

6. Please give your level of support for the following management practices for natural areas near your home.

Management Practice	Unacceptable in all cases	Unacceptable in some cases	Unsure	Acceptable in some cases	Acceptable in all cases
Removing shrubs	1	2	3	4	5
Spraying herbicides	1	2	3	4	5
Burning	1	2	3	4	5
Clearing trees from prairies	1	2	3	4	5
Thinning invasive trees in woodlands	1	2	3	4	5
Deer control	1	2	3	4	5

If you stated a practice was “unacceptable,” please explain why: _____

7. Please give your opinion of the following statements by circling the number that matches your response.

	Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree
Natural areas should be restored wherever possible.	1	2	3	4	5
Protecting air quality is more important than restoring health to natural areas.	1	2	3	4	5
Natural areas should not be managed, but left alone.	1	2	3	4	5
Natural areas add to the quality of life in my area.	1	2	3	4	5
We have enough natural areas in my county	1	2	3	4	5
The health of natural areas should be restored.	1	2	3	4	5
Having natural areas in my county is important to me.	1	2	3	4	5
Natural areas need to be restored so future generations can appreciate the natural world.	1	2	3	4	5
Natural areas cause problems for homeowners living nearby.	1	2	3	4	5
Fire is a useful tool in maintaining natural areas.	1	2	3	4	5

Cutting any trees degrades natural areas.	1	2	3	4	5
Preserve areas allow me to experience natural ecosystems.	1	2	3	4	5
Residents should be notified of burning in natural areas.	1	2	3	4	5
I feel applying pesticides for weeds damages natural areas.	1	2	3	4	5
Managing natural areas causes problems where I live.	1	2	3	4	5

8. Please give the level of importance you attach to the following statements by circling the number that matches your response.

“Natural areas are important to me because they...”

	<u>Not Important</u>	<u>Slightly Important</u>	<u>Moderately Important</u>	<u>Very Important</u>	<u>Extremely Important</u>
create wildlife habitat	1	2	3	4	5
protect threatened or endangered species	1	2	3	4	5
are a legacy for future generations	1	2	3	4	5
are part of God’s creation	1	2	3	4	5
create a pristine area as it was before the area was settled	1	2	3	4	5
provide places for recreation	1	2	3	4	5
provide open space	1	2	3	4	5
allow for biodiversity	1	2	3	4	5
create a place for me to escape the urban world	1	2	3	4	5
provide places for people to experience nature	1	2	3	4	5
create beauty in the urban landscape	1	2	3	4	5
are part of our American heritage	1	2	3	4	5

Section 3. Use of Fire as a Management Activity. Please answer the following questions about the use of fire to restore and manage natural areas.

1. I consider myself _____ about use of fire to restore and manage natural areas. (Please circle the number below that best matches your response).

Not very knowledgeable	A little knowledgeable	Fairly knowledgeable	Very knowledgeable
1	2	3	4

2. What do the following types of fire accomplish? Please check the box under the activity if it applies to the type of fire listed to the left.

	Ensures that fire does not get out of control	Restore healthy habitat	Renew soil nutrients	Conducted by trained personnel	Controls non-native species
Prescribed Burn					
Controlled Burn					
Wild Fire					

3. Please give the level of risk to each of the following that you feel results from using fire as a management tool.

Issue	No Threat	Slight Threat	Moderate Threat	Severe Threat
Health threat from smoke	1	2	3	4
Reduced visibility on highways	1	2	3	4
Fire escaping from natural area damaging nearby private property	1	2	3	4
Damage to ecosystem	1	2	3	4
Fire injuring wildlife	1	2	3	4
Damage to appearance of natural area	1	2	3	4
Reduced air quality from smoke	1	2	3	4
Damage to favored plants	1	2	3	4

4. Please rate how important you feel the following reasons are for burning on natural areas.

	<u>Not Important</u>	<u>Slightly Important</u>	<u>Moderately Important</u>	<u>Very Important</u>	<u>Extremely Important</u>
To promote species diversity	1	2	3	4	5
To protect endangered species	1	2	3	4	5
To remove non-native plants	1	2	3	4	5
To restore habitat for wildlife	1	2	3	4	5
To keep vegetation from growing too dense	1	2	3	4	5
To promote ecosystem health	1	2	3	4	5

5. How important is it to you that the following information about burns be included in future announcements regarding management activities?

	<u>Not Important</u>	<u>Slightly Important</u>	<u>Moderately Important</u>	<u>Very Important</u>	<u>Extremely Important</u>
Burn procedure (with diagram)	1	2	3	4	5
Burn procedure (without diagram)	1	2	3	4	5
Potential benefits for ecosystem	1	2	3	4	5
Potential benefits for people	1	2	3	4	5
Potential risks	1	2	3	4	5
Notification to nearby residents when and where burning will occur	1	2	3	4	5
Certification of burn personnel	1	2	3	4	5

Section 4. The following questions are important to help us understand more about the people living near natural areas in Illinois, Wisconsin, and Indiana. Please tell us something about yourself by checking the responses that apply. All responses will be kept confidential.

1. How many years have you lived in your present home? _____ Years
2. Do you own or rent your home? _____ Own _____ Rent
3. What is your state of residence? _____ Illinois _____ Wisconsin _____ Indiana
4. What is your county of residence? _____ County
5. Have you lived in your state all of your life? _____ Yes _____ No

If "No," in what state did you live before moving? _____

6. What is your gender? _____ Male _____ Female
7. What is the highest level of education you have completed?
- _____ 1) some high school _____ 4) some college
- _____ 2) high school _____ 5) college graduate
- _____ 3) trade or technical school _____ 6) graduate or professional degree
8. What is your approximate total (gross) household income?
- _____ 1) less than 20,000 _____ 4) \$60,000 to \$79,999
- _____ 2) \$20,000 to \$39,999 _____ 5) \$80,000 to \$99,999
- _____ 3) \$40,000 to \$59,999 _____ 6) \$100,000 or more

9. Please give your age. _____ Years

10. Do you belong to any of the following conservation or environmental organizations? Please check all that apply.

- | | |
|------------------------------------|---------------------------------------|
| _____ National Audubon Society | _____ World Wildlife Fund |
| _____ Defenders of Wildlife | _____ Sierra Club |
| _____ National Wildlife Federation | _____ Ducks Unlimited |
| _____ The Nature Conservancy | _____ Field Museum of Natural History |
| _____ Brookfield Zoo | _____ Environmental Defense Fund |
| _____ Chicago Botanical Garden | _____ Shedd Aquarium |
| _____ Chicago Wilderness | _____ Other (Please identify): _____ |

11. In what recreation or free-time activities do you participate? (Check all that apply)

- | | | | |
|---|--|---|--|
| <input type="checkbox"/> fishing | <input type="checkbox"/> snow mobiling | <input type="checkbox"/> snow skiing | <input type="checkbox"/> bird watching |
| <input type="checkbox"/> hunting | <input type="checkbox"/> water skiing | <input type="checkbox"/> hiking | <input type="checkbox"/> running/walking |
| <input type="checkbox"/> golfing | <input type="checkbox"/> tennis | <input type="checkbox"/> horseback riding | <input type="checkbox"/> sport shooting |
| <input type="checkbox"/> ATV riding | <input type="checkbox"/> mushroom hunting | <input type="checkbox"/> boating/canoeing | <input type="checkbox"/> cycling |
| <input type="checkbox"/> camping | <input type="checkbox"/> gardening | <input type="checkbox"/> dog walking/training | <input type="checkbox"/> photography |
| <input type="checkbox"/> in-line skating | <input type="checkbox"/> volunteering at natural areas | | <input type="checkbox"/> other volunteering |
| <input type="checkbox"/> visiting historical sites | <input type="checkbox"/> visiting museums | | <input type="checkbox"/> visiting nature preserves |
| <input type="checkbox"/> other (please identify): _____ | | | |

COMMENTS

RETURN ENVELOPE IS PROVIDED – POSTAGE-PAID

THANK YOU FOR YOUR TIME AND ASSISTANCE!

Your input will help us understand more about managing natural areas in Illinois, Wisconsin, and Indiana.

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