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PUBLIC LANDS VISITOR SURVEY: A METHODOLOGICAL COMPARISON PILOT PROJECT AT THE SOUTHERN UNIT OF THE KETTLE MORaine STATE FOREST

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December 2017



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ABOUT THIS REPORT

Efforts to update Wisconsin's statewide comprehensive outdoor recreation plan (SCORP) provided an opportunity to evaluate different techniques for assessing visitor use of and satisfaction with department-owned properties. Specifically, this pilot project assessed the relative merits of four different survey distribution methods at the Kettle Moraine State Forest – Southern Unit in fall 2016 with an eye toward applying what was learned to future efforts. This report describes the pilot study methodology and summarizes the results obtained. It interprets the information within pertinent contexts and identifies potentially useful lines of additional inquiry, but does not include specific recommendations or policy prescriptions. The report was prepared by the social science team to provide objective, policy-relevant information.

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BACKGROUND

The Wisconsin Department of Natural Resources (department) owns over 1.5 million acres of land in 47 state parks, nine state forests, 164 state wildlife areas, 19 state natural areas, 124 state fishery areas, various state trails, and other properties. In addition, the department holds easements on over 200,000 acres that provide several types of public access, primarily along streams and rivers and in working forests. While specific management objectives and allowable uses vary within and among specific property types, all properties serve as places for people to enjoy nature and pursue outdoor recreation. Department-managed public lands are found in all but one county of the state¹ serving recreation needs while also contributing economic benefits to local communities through tourism. There is renewed interest by the department in better understanding the visitors to department-managed lands: their frequency of visitation, the recreation activities they pursue, their satisfaction, and estimates of visitor numbers.

A Statewide Comprehensive Outdoor Recreation Plan (SCORP), developed every five years in Wisconsin to provide a roadmap for outdoor recreation, is required for the state and local municipalities to participate in the federal Land and Water Conservation Fund program. The 2018-2022 SCORP will contain required elements such as supply and demand of recreation as well as an assessment of needs and trends in outdoor recreation. In addition, the SCORP planning process provided an opportunity to conduct a pilot study to evaluate different techniques to measure visitor use of and satisfaction with department properties. This visitor survey methodology comparison was the first effort by the department to assess techniques for generating data from a wide range of property visitors while they are recreating. Most aspects of this pilot project including administration, data entry, analyses, and reporting were conducted by the department's social science team.

Visitation estimates are easier to calculate for some property types than others. For example, most visitors enter state parks through controlled access points and counts can be made through vehicle registration stickers, camping registrations, and other means. Many department-managed properties, however, do not require any type of registration and visitors can access the land through many dispersed locations making estimates of visitor use more difficult to capture. We undertook this pilot project to **test various methods for surveying visitors** with an eye toward applying what we learned here to future efforts to assess use of department-managed lands. We conducted our pilot evaluation in fall 2016 on the Southern Unit of the Kettle Moraine State Forest (headquarters in Eagle, WI). The property was selected because it hosts a diversity of recreation activities, includes both developed and dispersed access points, and provided staff support with data collection efforts.

¹ The department does not own land in Menominee County.

SUMMARY

This report evaluates the relative merits of four different survey distribution methods tested at the Kettle Moraine State Forest – Southern Unit (KMSU) in September and October 2016. The four methods tested were: (1) in-person visitor intercept interviews, (2) placing hardcopy questionnaires on parked vehicle windshields, (3) placing hardcopy questionnaires at self-serve kiosks, and (4) placing posters with quick-read (QR) codes linked to a web version of the questionnaire. The latter three methods are similar in that they require the respondent to take a proactive step to participate. In this report, they are considered self-administered surveys. Research findings from this project offer insights into the benefits and challenges of each survey method with a purpose of applying the methods at other state properties in the future. It is important to note that ***our objective was not to generate a statistical representation of property visitors nor to generate estimates of visitor numbers.*** Addressing how many people visit a property could be a useful next step (see “Future Research Needs” in the Discussion section).

To summarize the detailed findings, our research determined:

Comparisons of Response Rates, Time, and Cost

- Response rates vary by survey method. The intercept interview survey method received the highest number of completed questionnaires as well as the highest response rate. The QR code survey method received the lowest number of completed questionnaires, generating less than five responses in eight weeks. In between these extremes, the windshield method yielded more returned questionnaires than did the self-service kiosk method.
- No difference was found for data quality and questionnaire completion across the methods tested. Of the 12 questions considered, completion was consistently high (94% or higher) for each method (with the exception of the QR code survey method, to be discussed later).
- From a staff-time perspective, the windshield route method yielded the highest ratio of returned questionnaires (2.3 completed questionnaires per staff hour). The intercept interview method was labor intensive and yielded 1.9 returned questionnaires per staff hour. The self-serve kiosk method yielded a ratio of slightly more than half that of the windshield route (1.3 questionnaires per staff hour).
- Looking at cost per hour of time spent, in-person, windshield, and self-serve kiosk methods compare similarly in terms of cost per hour, although the final difference comes down to the rate at which personnel time is billed (i.e., pay differential of permanent staff and limited term employees).
- Although overall cost is lowest for the QR code method, it is the most expensive method when cost per returned questionnaire is calculated (up to five-times as expensive as the other methods). The intercept interviews and windshield methods were least expensive per return due to the high number of returned surveys. Cost per returned questionnaire via the self-serve kiosk method was about a third more than the windshield and intercept interview methods.

Comparisons of Responses by Survey Method

- The method of administering the questionnaire influenced both the types of visitors that completed surveys and the content of their responses. For example, respondents to the intercept interview method were more likely to say they had no or few substitutes for their visits to the KMSU, they visited in smaller group size, and that they were male.
- Viability of a survey method is dependent, in part, on when that method is applied, meaning the hours available to capture visitor participation. This is particularly relevant to the interview method. For example, hunters were interviewed in parking lots rather than afield, yet some hunters likely arrived prior to our 8:00 a.m. start time and may have left the property after the interviewer shift concluded.
- Visitation frequency was significantly different among hikers and hunters. For both groups, respondents to windshield questionnaires reported more frequent visits during the fall than did respondents to intercept interviews. In addition, hikers responding via self-serve kiosks said they visited more frequently than hikers who were intercepted by interviewers. One possible explanation for differences in the visitation frequencies by hikers and by hunters may be that regular users of the property feel more attachment to the place and, therefore, are more motivated to participate in self-administration survey methods. If that is the case, windshield and self-serve kiosks may be overestimating visitation frequencies for regular visitors.
- The windshield survey method may hold greater utility over intercept interviews if activity participation typically occurs during off-hours. Of the three survey methods, the windshield method captured more hunters who hunted longer. Hunters tend to begin and end the activity at dawn and dusk, time periods outside of the four-hour interview shifts we used. This may have resulted in them being less likely to be intercepted by interviewers, especially during afternoon shifts. Kiosks may be even less noticeable in low light conditions at dawn and dusk. Therefore, the windshield survey may have been more effective at capturing individuals hunting longer hours than either the intercept interview or self-serve kiosk methods.
- Age data were significantly different for hikers and hunters by survey method. Returns of windshield and self-serve kiosk questionnaires from hikers and hunters reflected older users than did the results of intercept interviews. One explanation for the age differences may lie with the implementation of intercept interviews. Missing values on the age question for intercept interviews may have resulted from visitors not wishing to answer in front of the interviewer or from interviewers who were uncomfortable asking visitors their age. Additionally, some respondents may have provided a younger age to interviewers than was true. Together, these may have reduced the age data at the older end of the continuum, thereby reducing the average age reported for intercept interviews. Additional research would be needed to address this question.

Future Considerations

- Future considerations could be given to the design features of intercept interviews to standardize interview protocol and to shorten any lengthy response option lists so they appear in a single screen on a tablet rather than requiring scrolling.
- We anticipated the QR method held potential for yielding a high return relative to cost. The method, however, was so unpopular with property visitors that it failed to yield enough completed surveys to enable methodological comparisons. Thus, we do not recommend this approach as a reliable method for visitor data generation purposes in most instances.
- Installing the self-service kiosks near other signage may have hindered their potential effectiveness because frequent users of the property know where they are going and typically do not stop to read property notices, maps, or other announcements. Future efforts might consider placing kiosks at alternative locations away from parking areas and other property signage – further up a trail (perhaps at a fork or rest area) where their presence may be more noticeable by visitors.
- Site-specific surveying of visitors to public land cannot be accomplished with a static methodology; survey methods must be adapted to suit unique situations. For example, when interviewer hours cannot accommodate activity participation (e.g., hunting), windshield surveys may be a better option for capturing visitor participation.

INTRODUCTION

PILOT STUDY SITE SELECTION

The Kettle Moraine State Forest – Southern Unit is a 22,000+ acre property in southeastern Wisconsin, located approximately 61 miles east of Madison and 37 miles southwest of Milwaukee. The property is one unit of the six separate Kettle Moraine properties which are connected by the Ice Age Trail and the Kettle Moraine Scenic Drive. The KMSU hosts a variety of features including state natural areas, the Scuppernong River Habitat area, segments of the statewide Ice Age Trail, a museum/gift shop, and publicized public events. The property offers opportunities to participate in bicycling (both road and trail), camping, dog field training, fishing, horse riding, hunting (including stocked pheasants), swimming, running, cross-country skiing, picnicking, mushroom foraging and general nature-based activities.

KMSU was selected as the site to pilot the various visitor survey methods because of its wide range of landscape types, many different types of users, its proximity to the department's Madison office (where most of the researchers are stationed), and because it had a cooperative, knowledgeable, and dedicated property staff who were willing to assist with the research project.

KMSU is geographically large and complex and has a variety of settings (e.g., monitored and unmonitored areas, day-use areas, and campgrounds, and areas that range from heavily to lightly used). These different areas are similar to the range of settings and recreation opportunities found at different types of department properties around the state. As a survey technique testing ground, KMSU provided a diversity of settings that enable the results to have applicability to other department lands.

THE QUESTIONNAIRE

The questionnaire was developed by the social science team in consultation with personnel from the Bureau of Facilities and Lands, KMSU staff and superintendent, and SCORP advisory groups. Numerous public lands surveys including some conducted by the U.S. Forest Service, the U.S. Bureau of Land Management, other state parks programs, and other countries' governmental agencies were referenced to guide development of this questionnaire.

With an intended purpose of comparing methodologies for gathering information from property visitors, questionnaire content was considered secondary to developing a visually appealing design which encouraged completion, minimized respondent burden, and feasibly functioned across multiple media. The questionnaire was designed to simulate content and format for questionnaires to be used in future surveying efforts, but not necessarily pilot or evaluate specific questions.

The same content, wording, format, and question order were used across the three media on which the questionnaire was distributed (tablet computer, hardcopy, and Internet website). Questions developed for the paper format (windshield and self-service kiosk distributions) were developed so that they transferred well to the electronic formats.

IMPLEMENTATION

INITIAL TRIAL PERIOD METHODS (SEPTEMBER 2016)

The initial implementation period of September 2016 was preceded by considerable time spent on logistics, scheduling, recruiting interview personnel, scoping locations, planning strategies and consulting with park staff. The survey methods to test in the study included the following:

- 1) Intercept Interview Method: Department staff were stationed at designated locations throughout the property for four-hour time shifts to administer a voluntary questionnaire to visitors. The survey was conducted on Galaxy Android tablets equipped with the app Droid Survey (from HarvestyourData.com; Figure 1). The questionnaire took approximately five minutes to complete.

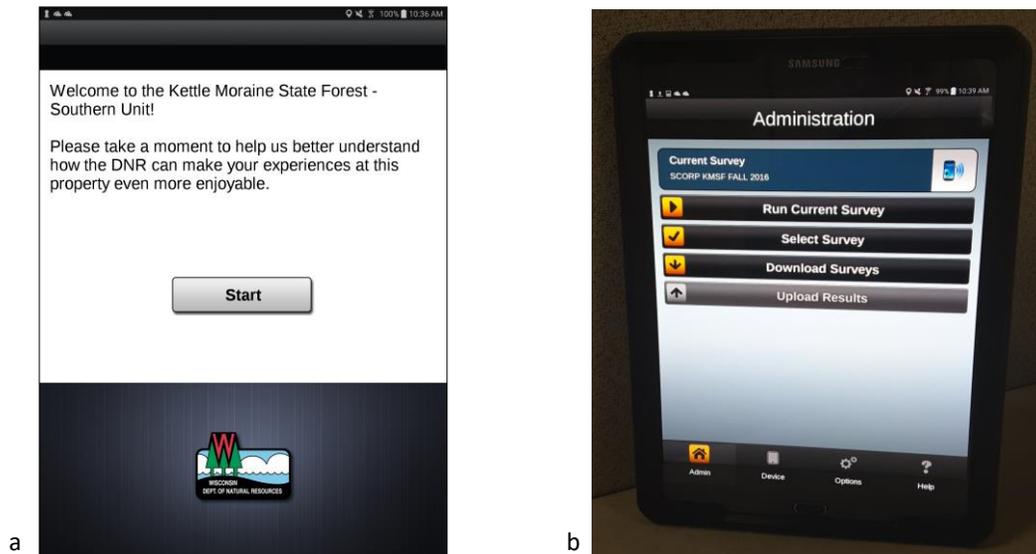


FIGURE 1. Images of a) introductory screen on the tablet survey, and b) tablet running the survey software.

A total of 12 department employees administered the intercept interview surveys over the two-month duration of the project. Interviewers were drawn from the social science team, the Bureau of Facilities and Lands, and KMSU staff visitor service associates (VSAs) and naturalists. The number of interviewers was kept to a minimum to maintain consistent protocols. Interviewers were scheduled to work either mornings or afternoons (never two consecutive shifts) with morning shifts running from 9:00 a.m. to 1:00 p.m. and afternoon shifts running from 1:00 p.m. to 5:00 p.m.

Interviewers were instructed to approach all visitors as they were returning to their vehicle or passing through on foot/bike with an invitation to provide feedback about their experiences that day at the property. Prior to launching the survey, interviewers first entered their name and location on the tablet, which then automatically advanced to a screen where interviewers could record visitor input. The first screen documented survey consent. If the visitor agreed to participate, the interviewers were given flexibility in how to administer the survey -- whether by handing the tablet over to the visitor, holding the tablet for the visitor to view and read along, or by orally stating the questions.

Most interviewers found success in the hybrid approach of reading the questions out loud while holding the tablet so that the visitor could read along and review the lists of possible responses. Interviewers were instructed to only prompt one visitor per party for feedback, however if multiple people in the same party asked to take the survey, they were allowed to do so.

- 2) Self-Service Kiosk Method: Five self-service kiosk stations were installed at outdoor locations in unpaved areas near edges of selected parking lots. The stations included an eye-catching poster (designed to accommodate color-blind individuals) inviting visitors to participate in the survey effort, paper copies of the questionnaire, and a tamper-proof mailbox for depositing completed surveys. One self-service kiosk was a countertop unit placed in a prominent location on the front desk of the visitor center. The posters on the kiosks were laminated and stapled to a painted plywood backing, and had QR codes on them as an internet alternative to the paper questionnaire. Each QR code had a unique web address so that we could determine the location from which a QR code was scanned. Stations were constructed in the field, installed, and stocked with questionnaires on September 2, 2016.

Outdoor self-service kiosks cost about \$60.00 each to construct and took about eight hours total to construct. Tasks included researching construction methods, shopping for supplies, designing, printing, and laminating posters, painting unfinished wood, installing a seven-foot galvanized outdoor sign post, one small locking metal mailbox (for depositing completed questionnaires), and one small, non-locking metal mailbox (for obtaining the paper questionnaires). Materials for the indoor desktop drop-box cost under \$5.00 .



FIGURE 2. Images of a) counter-top self-service survey box, b) freestanding outdoor self-service kiosk, and c) poster.

Self-service kiosks were installed at five unique locations (see Table 1) and stocked with a supply of questionnaires. Each kiosk was initially stocked with 50 questionnaires, each location having a unique color and each individual questionnaire having a unique numerical identification for tracking purposes. The five different paper colors used for the self-service kiosks were distinct from the windshield and campground questionnaires (both described elsewhere in this report). Aside from color differences and unique identification numbers, the content and formatting was identical. The questionnaire was printed on legal-size paper (8.5"x14") and tri-folded as a self-mailer with stickers affixed inside to seal the questionnaire upon completion. The self-service kiosk questionnaires also had the same postage-paid business reply and return address, providing the respondents the option of completing the survey on site and placing it in the drop-box or mailing the survey back via the U.S. Postal Service.

Self-service kiosks were checked by department staff weekly and completed questionnaires were collected. Routine checks also allowed staff to restock as needed, as well to check for vandalism. Periodic interim checks were also done as convenient. These tasks took about one hour per week.

- 3) Parked Vehicle Windshield Method: During the September pilot, paper copy surveys with a postage-paid (business reply) return address were placed under the windshield wipers of parked cars. Researchers followed a designated route within the state forest at designated times. Basic instructions, a log form, a route map, and a box of consecutively-numbered questionnaires were given to staff assigned to the routes. The September windshield route, distribution instructions, schedule, and log forms are included in Appendices 2 through 5.



FIGURE 3. Images of survey placed on a) car windshield along roadside, b) parking lot, and c) surveys placed on cars in a parking lot.

- 4) Quick Read (QR) Code Poster Method: Posters with an eye-catching message, an invitation for visitors to participate in the survey effort, and a QR code were posted on bulletin board locations, bathrooms, existing signposts, and free-standing signs at multiple locations on the property. Since the cell coverage strength varied within the KMSU, locations were selected where reliability was best on the research team’s phones. A total of ten posters, each linked to a unique web address, were installed on September 2, 2016. The QR Code, when scanned, led to an electronic version of the paper copy questionnaire; questions, order, and format, to the extent possible, were the same as the paper copy. The electronic version used the program Select Survey.



FIGURE 4. Images of a QR code-only poster on a) an existing post location (Paradise Springs), b) on a bathroom door, and c) on a freestanding sign post.

Overall Approach:

Data collection locations were selected based on KMSU staff knowledge of recreational user types and volume. As such, our design was not random, but purposive in nature. Forest staff categorized areas of the property into high, medium, and low use sites. Two high recreation use areas, six medium use areas, and four low use areas were selected for the study. The intercept interview method was administered at each site. To compare results of the different survey methods, each site also included either a self-service kiosk or was a designated stop on the windshield route. The paired sites are shown in Table 1.

TABLE 1. Property locations (designated as high, medium, and low use) of four survey approaches.

Parcel category	Locations	Intercept Interviews	Self-Serve Station	Windshield Route	QR Posters	Visitor Count ² Validation
High Traffic						
Matched Comparison 1	Ottawa campground	X		X	X	
	Visitor Center/Forest HQ	X	X			X
Medium Traffic						
Matched Comparison 2	Scuppernong skiing & hiking trails	X		X		X
	Nordic skiing & hiking trails	X	X			X
Matched Comparison 3	Emma Carlin biking & hiking trails	X		X		X
	John Muir biking & hiking trails	X	X			X
Matched Comparison 4	Eagle horse & snowmobile	X		X		X
	Ottawa horse & snowmobile	X	X			X
Low Traffic						
Matched comparison 5	Hunter parking lot Hwy ZZ	X		X		X
	Hunter parking lot Hwy 67, Stark Rd.	X	X			X
Matched Comparison 6	Ice age parking lot Hwy 67	X		X		X
	Ice age parking lot Hwy 12	X	X			X
Additional Locations	Ottawa Campground bathrooms				X	
	Paradise Springs (QR Only #2)				X	
	Whitewater campground (QR Only #3)				X	
	Hunter lot on 67 (larger, QR only lot) QR Only #4				X	

² See Appendix 7.

INITIAL TRIAL PERIOD RESULTS

The designated windshield routes were traveled 13 days in September (see Appendix 4) and included 12 parking lots. Of 545 questionnaires distributed on the windshield routes, 148 were returned. Three were returned to the self-service kiosk drop boxes and 145 were returned via U.S. mail, yielding a 27 percent response rate. Staff spent approximately 52 hours on the tasks associated with the windshield method, which equates to 2.8 completed questionnaires/hour of staff time.

The intercept interview method generated considerably more completed questionnaires than the windshield method, but required greater effort and as a result generated fewer completed questionnaires per hour of staff time. Of 376 interviews attempted in September, 359 were successfully completed yielding a 96 percent completion rate. Nine people declined to participate, five additional people declined because they had already taken the survey and did not want to take it again. All total, 201 hours of personnel time was spent interviewing property visitors (this figure does not include time spent traveling to intercept sites), for an average of 1.8 completed questionnaires/hour of staff time. Estimated hours spent for each of the three different types of traffic volume locations are presented in Table 2.

TABLE 2. Survey effort for in-person, intercept interviews by designated traffic volume location.

Anticipated Traffic Volume	# Hours Interviewing	# Surveys Attempted	# Surveys Returned	Surveys/ Hour
High Use Area	32	78	75	2.3
Medium Use Area	140	243	233	1.7
Low Use Area	12	8	7	0.6
Other (not a matched pair)	17	47	44	2.6
TOTAL	201	376	359	1.8

Returned questionnaires from "Other" sites: Bald Bluff = 8, Horseriders Campground = 22, Paradise Springs = 13, Pinewoods Campground = 4.

The self-service kiosks yielded fewer returned questionnaires but resulted in a considerably higher return per hour of staff time. The five self-service kiosks were in place for the duration of the September trial period. During that time, 52 questionnaires were completed, including 27 which were returned via U.S. mail and 25 which were collected from the self-service drop boxes. Staff time per completed questionnaire included the time spent actively checking mailboxes, refilling, and retrieving surveys. At an estimate of one hour per week, about four hours were spent on kiosk-related tasks, yielding about 12.8 questionnaires/hour of staff time.

The QR codes received six scans, only two of which resulted in completed questionnaires. Scans originated as follows: one from a QR-only poster at Paradise Springs, one from the kiosk sign at the Ice Age trail parking lot on HWY 12, three from the larger hunter parking lot on highway 67, and one from the Nordic Skiing/Hiking Trails kiosk. The completed online questionnaires were scanned at the Ice Age Trail parking lot kiosk and the Nordic Skiing/Hiking Trails kiosk (one each). None of the posters with QR codes alone generated a completed questionnaire. After posting each of the QR-only posters, no dedicated hours were spent on data collection.

Staff took time to check that posters had not been vandalized or taken down while completing weekly maintenance of the self-service kiosks, when a staff person was interviewing at that location, or during a windshield route.

SECOND PHASE TRIAL PERIOD METHODS (OCTOBER 2016)

- 1) Intercept Interview Method: Interviews continued similarly in the second phase as in the initial phase. Most staff members who conducted interviews in September continued in October, avoiding the need for additional recruitment and training. Interview shift timing did, however, change to better capture the user groups present during the fall. With an increase in hunters as pheasant, small game, and deer seasons opened, interview periods were adjusted from 9:00 a.m. to 1:00 p.m. and 1:00 p.m. to 5:00 p.m. to 8:00 a.m. to 12:00 noon and 2:00 p.m. to 6:00 p.m. During September, we found it difficult to contact enough visitors at low use areas to draw conclusions. The decision was made to increase our interview effort during October. Intercept interviewing was further supplemented with “roving-intercept” interview surveys in October (see discussion below).
- 2) Self-Service Kiosk Method: Kiosks remained in their same locations for the duration of October. Time spent dedicated to collecting and refilling self-service kiosks was even less than in September because dedicated time was not needed for refills or collection, as those were done periodically as part of the roving intercept/windshield route.
- 3) Parked Vehicle Windshield Routes/“Roving” Interview Method: The second trial phase added a new technique to capture diffuse patterns of visitation (i.e., visitors that access areas of the property from spots other than parking lots or other designated use areas). The windshield/“roving” interview method was introduced, combining in-person intercept interviews with the tasks previously completed during the windshield survey route. The roving intercept/windshield survey method was designed to be flexible and take advantage of opportunities to survey visitors as they arose. Interviewers were instructed to drive a designated route for a given time period (the same as the stationary intercept interviews: 8:00 a.m. to 12:00 p.m. and 2:00 p.m. to 6:00 p.m.) to distribute questionnaires on vehicles parked on KMSU road shoulders or in designated parking lots. In addition, staff would seek to complete an interview with visitors as they encountered them.

The suggested route (Figure 5) was selected based on discussions with park staff about popular areas for roadside parking and unmarked parking lots, as well as researchers’ analysis of the route for time and efficiency. The only restrictions on the suggested route were that interviewers were not to distribute questionnaires at parking lots where self-service kiosks were located. Areas within the property boundary that are operated by third party organizations (McMiller shooting range and Old World Wisconsin) were also excluded. Staff kept a log identical to the initial trial phase (see Appendix 5) when distributing surveys on parked vehicle windshields. Questionnaires were placed on all vehicles encountered that were parked on state land. If people were present, the researcher completed an intercept interview on a tablet instead of leaving a windshield questionnaire. Instructions provided to staff prior to initiating the windshield route are included in Appendix 6.

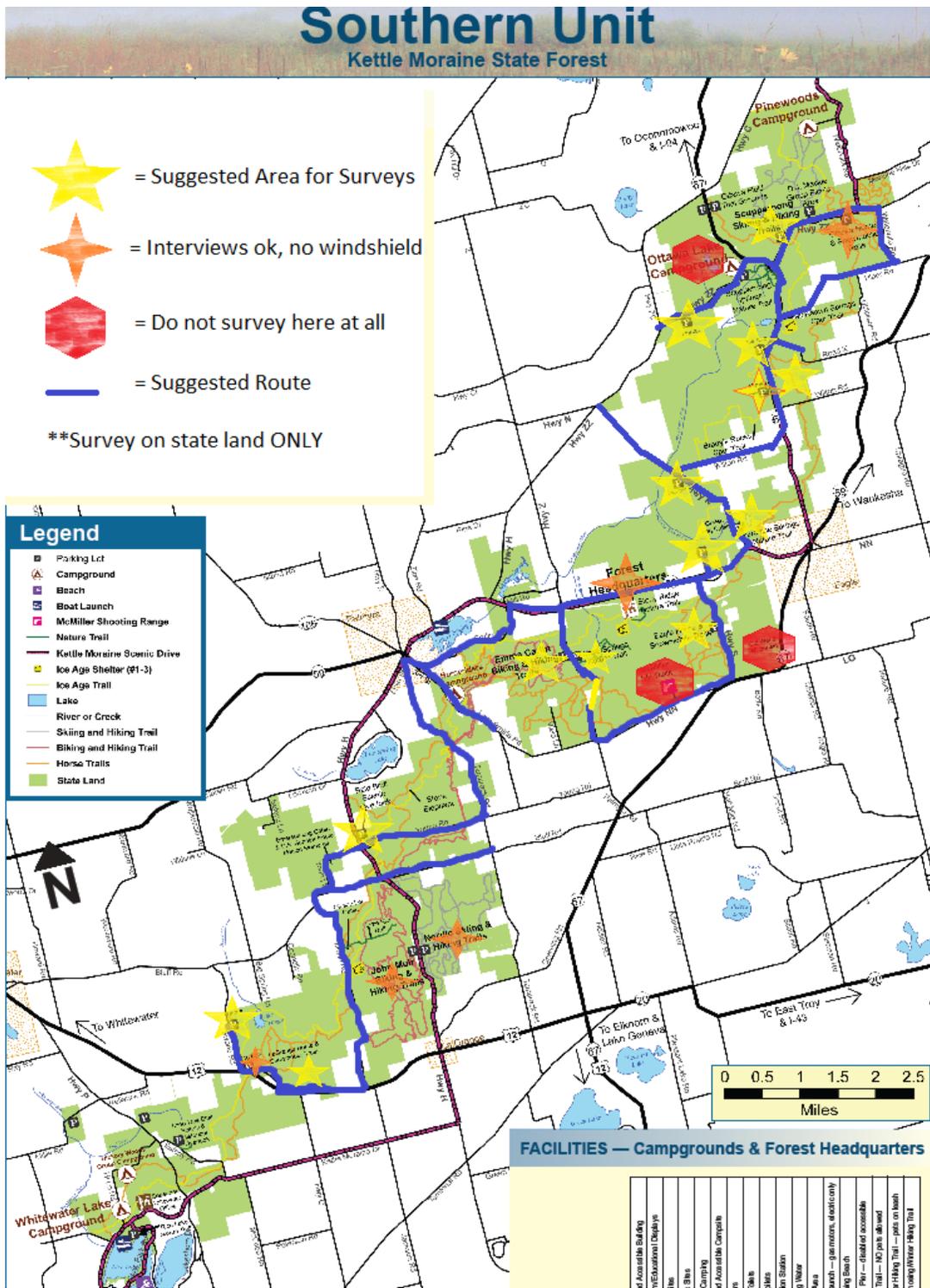


FIGURE 5. Map identifying locations for surveying and suggested routes.

- 4) QR Code Poster Method: Methods for and locations of the QR posters in October remained the same as the previous month. Posters were checked only infrequently, however, which may have biased some of the results. One of the campground bathroom posters was missing when checked in late October and two other bathrooms where QR posters were located were shut down sometime in October for seasonal preparations for the winter.
- 5) Campground Handout Method: When pre-testing the October windshield/“roving” interview method, we found that visiting the Ottawa Lake Campground took longer than expected and was geographically disparate from other areas of the property that were a higher priority for surveying. Hence, the decision was made to remove Ottawa Lake Campground from the windshield/“roving” interview route. Instead, visitors to the campground were surveyed with assistance from the visitor service associates (VSAs). The VSAs were instructed to hand questionnaires to visitors (one per car) at the time a vehicle checked-in to the fee area. Questionnaires for this method were sequentially numbered and were differently colored than surveys used in other parts of the property. This enabled data entry personnel to easily track the origin of returned questionnaires. To track the returns at the Ottawa Lake Campground, the VSAs kept a log (same log sheet as windshield survey route) of the date, time, weather, and the unique questionnaire numbers as they were distributed.

SECOND PHASE TRIAL PERIOD RESULTS

Of 574 windshield questionnaires distributed in October, 166 were returned. Three were returned to the self-service kiosk drop boxes and 163 were mailed back, yielding an overall 29 percent response rate. Staff spent approximately 58 hours distributing questionnaires and completing “roving” interviews, for a total of 2.9 completed questionnaires/hour of staff time. This is nearly identical to the results from the initial phase in September.

During October, 173 intercept interviews were attempted that spanned 49 hours of personnel time at stationary locations (not including travel time), and the previously mentioned 58 hours of roving interview/windshield route combination task. From the 173 interview attempts, 160 were successfully completed, yielding a 92 percent return rate. Twelve people declined outright to participate and one person declined to participate because they had already taken the survey and did not want to participate again. In October, stationary interviewers dedicated six hours to interviewing in high use areas, 16 hours in medium use areas, and 27 hours in low use areas, including other locations not originally included in the matched pair design. The number of questionnaires collected per traffic volume location type is outlined in the Table 3 below. Unlike in September, an estimate of questionnaires per hour cannot be deduced from the hours spent doing (stationary) interviews, because some surveys were also completed while conducting roving intercept/windshield tasks.

TABLE 3. Surveys collected by designated traffic volume location.

Traffic Volume	# Hours Stationary Interviewing	# Surveys Attempted	# Surveys Completed
High Use Areas	6	23	21
Medium Use Areas	16	49	46
Low Use Areas	27 (stationary)	46 (matched pair locations) 55 (other locations)	93

The self-service kiosk method resulted in 61 completed questionnaires including 41 which were sent back in the mail as well as 20 which were collected from the self-service drop boxes. The numbers of returned questionnaires from the self-serve kiosks for the initial and second phase are shown in Table 4.

TABLE 4. Return rates at self-service kiosk locations (combined initial and second phase).

Location	Anticipated Traffic Volume	# Taken*	# Returned	Return Rate
Forest HQ/Visitor Center	High traffic	164	18	11%
Ottawa Trails	Medium traffic	37	12	32%
John Muir Trails	Medium traffic	53	20	38%
Ice Age Trail Parking lot on 12	Low traffic	28	11	39%
Hunter Parking lot on 67	Low traffic	29	16	55%
Nordic Trails	Medium traffic	57	37	65%

* Less questionnaires which were returned vandalized or significantly incomplete

No completed questionnaires from the QR-only survey posters were generated in October because not a single poster was scanned during the month. Staff took time to check that posters had not been vandalized or taken down while completing weekly maintenance of the self-service kiosks or during a windshield route.

In total, 156 questionnaires were handed out in October at the Ottawa Lake Campground. Of those, 18 were returned, yielding a 12 percent response rate. Compared to the 27 percent response rate on windshield questionnaires handed out at the Ottawa Lake Campground and day-use area in September, it's clear that the hand-out method and the windshield method are not equivalent. This is somewhat surprising because one could have hypothesized that the "social contract" implied with the hand-out method would have equaled or exceeded the response rate generated via the windshield method. The lower response rate raises questions as to whether the method in which questionnaires were delivered has an impact on return rate, whether the time at which a questionnaire is handed out has an impact on return rate (check-in versus departure), or whether there was something fundamentally different about the October versus September visitors' willingness to participate in the survey.

DATA ENTRY – NOTES ON INCLUSION

Questionnaires returned in the mail were included for data entry through December 1, 2016; those received after this date were kept and labeled with date received for archival purposes, but not included in the dataset.

Data were cleaned using standard methods, including removing outlier responses (e.g., a returned windshield questionnaire indicating the group size was 100). While an outlier may be factual it doesn't represent the typical use of the park and unreasonably distorts the data set. Of the 1,043 records, 13 (1%) were removed as outliers and recorded as missing values in calculating results.

METHODOLOGY COMPARISON

The following comparisons of the four methodologies tested are based on data generated during both trial periods of this study. For example, findings reported for "windshield routes" combine all data collected from windshield surveys in both September and October 2016 in all locations.

SURVEY VOLUME AND RESPONSE RATE

After two months surveying at the Kettle Moraine State Forest - Southern Unit, the intercept interview method received the highest number of completed questionnaires as well as the highest response rate. The self-service kiosk survey method had the second highest return rate, but a lower number of total questionnaires received than the windshield route method. The QR code survey method received the lowest number of responses overall. Although the response rate cannot be calculated due to an open population, the response rate can be inferred based on estimates of visitation to the areas served by the QR code signs, to be a small fraction of a percent (Table 5).

TABLE 5. Response rates of four survey methods.

Method Type	# Completed Surveys	Response Rate
Intercept Interviews	518	95%
Self-Service Kiosks*	113	40%
Windshield Routes	312	25%
QR Code**	2	-

*Average of six individual locations' return rates, based on number of questionnaires available for completion.

**Response rate cannot be calculated due to unknown population.

DATA QUALITY AND COMPLETION RATE

All four survey methods had high completion rates (Table 6). Eleven questions were measured to assess completion rates. Intercept interviews had the highest percentage of respondents completing each question, however quality (defined as completion) is not greatly impacted by method type.

On the paper questionnaires (self-service kiosk and windshield methods), respondents could skip any question they wanted, although a majority of respondents provided complete questionnaires. The format of the questionnaire on the tablet allowed respondents to skip any question, except for question 8, which required the respondent to select at least one answer.³ Likewise for the QR code surveys, any question could be skipped thereby allowing respondents to complete as much or as little as they liked.

TABLE 6. Number of missing responses per question and percentage of respondents completing each by survey method.

Method:	Intercept Interviews		Self-Service Kiosks		Windshield Routes		QR Code	
Total Returns	518		113		312		2	
Question	N Missing	% Complete	N Missing	% Complete	N Missing	% Complete	N Missing	% Complete
Date	0	100%	7	94%	1	100%	0	100%
Q1	0	100%	0	100%	0	100%	0	100%
Q2	0	100%	3	97%	1	100%	0	100%
Q4	0	100%	1	99%	1	100%	0	100%
Q5	0	100%	3	97%	3	99%	0	100%
Q6	0	100%	1	99%	1	100%	0	100%
Q7	0	100%	1	99%	3	99%	0	100%
Q9	0	100%	1	99%	0	100%	1	50%
Q10	0	100%	4	96%	1	100%	2	0%
Q11	0	100%	1	99%	3	99%	0	100%
Q12	31	94%	3	97%	0	100%	0	100%
Q13	0	100%	2	98%	1	100%	0	100%

TIME INVESTMENT

Table 7 outlines the hours spent by staff on each method during the two month pilot project. Travel time for staff to and from KMSU is not included. With 86 hours of staff time and 113 questionnaires returned, the self-service kiosk method yielded 1.3 questionnaires/hour of staff time. The interview intercept method yielded 1.9 questionnaires/hour of staff time while the windshield route method generated 2.3 questionnaires/hour of staff time. The QR code method achieved one-quarter of a questionnaire returned for every hour spent; in other words, eight hours of staff time setting up the QR codes yielded two completed questionnaires.

³ Question 8 asked about the most important property attributes on which to spend public funds.

Our findings show the windshield route and the intercept interviews yielding the most returned surveys per hour invested. These methods, however, produce very different results when compared across the various survey locations. As was briefly discussed in the methods section, the intercept interview method experiences a drastically reduced completed survey/hour rate in lower density areas, such as a hunter parking lot during non-peak hunting hours.

TABLE 7. Estimated staff hours for each survey method.

Method	Estimated Staff Hours	Returned Surveys	Returned surveys/ staff hour
Self-Service Kiosk			
Paper questionnaire prep.	6		
Station construction	53		
Stocking/checking	8		
Data entry	19		
Subtotal	86	113	1.3
Intercept Interviews			
Tablet set-up/download	6		
Survey Software Training	2		
In-person interviews	269		
Subtotal	277	518	1.9
Windshield Route			
Paper questionnaire prep.	7		
Data entry	37		
Distribution	92		
Subtotal	136	312	2.3
QR Codes			
Online Programming	3		
Poster const./install	4		
Data transfer	< 1		
Subtotal	7	2	-

COST

Producing a precise cost estimate based on expenditures for the purposes of informing future projects presents a challenge. This pilot effort required an initial investment in some equipment that may or may not be required or applicable to future projects. Equipment costs (e.g., smart tablets and the kiosk station mailboxes, even though they can be re-used for future projects) have been included in our estimates. If a program were to use existing equipment rather than starting from scratch as was done in the pilot project, costs may be markedly reduced. Additionally, extensive travel time was required for Madison-based staff to make field visits for trainings, data collection, and research purposes, which would likely not be duplicated in future applications. Travel expenses have, therefore, not been factored into the cost estimates. Costs for each of the methods are examined by two ratios: the calculated cost per hour of each method and the calculated cost per returned questionnaire per method.

Looking at cost per hour of time spent, QR codes are by far the cheapest survey method to implement. Cost is essentially a moot point, however, given that QR codes were not viable for generating responses in our pilot study. The other three methods compare similarly in terms of cost per hour, although the final difference in the cost per hour comes down to the rate at which personnel time is billed. Using a rate of \$20.00/hour, all methods are within \$1.00 of each other's cost per hour. When a \$50.00/hour rate is used for personnel time, the difference becomes greater; the self-service kiosk is the cheapest method per hour (since it uses less personnel time); interviews and windshield surveying come in about \$10.00/hour more expensive.

Intercept interviews and windshield routes were least expensive per completed questionnaire. Cost per returned questionnaire via the self-serve kiosk was about a third more than the windshield and intercept interview methods. The higher up-front cost of constructing the kiosks combined with the lower number of questionnaires received from this method contributed to the relatively higher cost per completed questionnaire for this method.

SAMPLE COMPOSITION

To further assess the performance of each method, we looked at the composition of the returned questionnaires from each of the three methods that proved viable (intercept interview, windshield routes, and self-serve kiosk). In other words, we asked ourselves, *How might the respondent profile differ or concur based on survey method?* Overall, statistical differences between the three methods were not found for mean age of the respondents nor for where respondents live (urban-suburban, rural farm, rural non-farm). Further, each survey method yielded similar priority rankings for where KMSU funding should be directed.

Several statistical differences were noted between the survey methods (determined by Chi-square values at the .05 level of significance, Table 8). Self-serve kiosks were more likely than the other two methods to capture hikers while the windshield route method was more likely to capture hunters and campers (likely an effect of targeted efforts for those user groups by having personnel stationed at campgrounds, hunter parking lots, and hiking trail heads). The self-serve kiosk method was also more likely to capture respondents that visit the property on a weekly basis. The intercept interview method resulted in three attributes being statistically different when compared to the other methods; respondents were significantly more likely to say they had no or few substitutes for their visits to the KMSU, they visited in significantly smaller group size, and that they were male. These differences may be partially explained by respondent bias (responding in a perceived desirable direction such as "I have no substitutes" and traditional gender roles of males tending to take the lead in unknown situations) and interviewer bias of avoiding (purposely?) larger groups.

TABLE 8. Possible effects of survey method.

Variable	Intercept Interview	Self-serve Kiosks	Windshield Routes	Total
Primary purpose of visit				
Hiking	32%	44% *	34%	34%
Biking trails	17%	13%	6%	13%
Horse riding	13%	8%	8%	11%
Hunting	9%	6%	15% *	11%
Running	5%	8%	5%	5%
Camping	6%	4%	16% *	11%
Dog walking	6%	5%	3%	5%
Substitutes none/few	74% *	57%	48%	63%
Weekly visits to property	36%	53% *	38%	38%
Priority funding				
Trails	40%	42%	38%	39%
Habitat	18%	14%	16%	17%
Signage/Education	15%	18%	17%	16%
Completed before Yes	12%	5%	9%	10%
Group size mean	2.4 *	3.5	3.5	2.9
Gender				
Male	63% *	48%	50%	56%
Female	37%	52%	50%	44%
Age mean	49	54	55	51
Respondent origin				
Rural farm	12%	7%	9%	10%
Rural non-farm	26%	32%	30%	28%
Urban/suburban	62%	60%	61%	62%

* Denotes a statistical difference at $p < .05$.

Do within user group responses differ by survey method?

The population of each user group of the KMSU has a theoretical profile of behavior, preferences, and demographics that can be sampled and estimated through surveys. One of the research questions in this study was whether survey methods are equivalent in the data captured to draw user profiles and to estimate visitor use patterns. We compared the questionnaire responses for nine different variables across survey methods for three of the more prominent user groups of the property: hikers, trail bikers, and hunters. Understanding that visitors often engage in multiple activities during their property visit, we defined users for this analysis by their response of what was their primary purpose for visiting. We also limited the cases to consider only single-day users by filtering out those who also camped since that activity inherently changes their response to the time-spent variable. We ran a series of cross-tabulations to compare categorical frequencies of age, residence, group size, travel time, time spent, visitation frequency, satisfaction, substitutability, and single activity focus by survey method. These crosstabs were repeated for hikers, trail bikers, and hunters. Differences in frequencies by survey method were determined by Chi-square values at the .05 level of significance.

The responses to variables were significantly different by survey method in 12 of 27 tests (Table 9). For both hikers and hunters, responses were significantly different based on survey method for five of nine variables.

For trail bikers, survey results were significantly different in two of nine variables. These findings suggest that the selection of survey method has implications for the accuracy of developing representative user profiles as well as population estimates of visitors, and that the degree of influence of the method may vary depending on groups.

Three of the nine variables generated similar in-group results regardless of method. These variables were travel time, urban/rural residence, and satisfaction level. It may be the case that each survey method performs the same when evaluated by variables for which there is less variability (e.g., most visitors have been to the property repeatedly and would not return if not satisfied with their experiences; thus, the expectation is that there would be little variability in satisfaction ratings).

The only variable that was significantly different by method among all three user groups was the question about substitutability. The question is a proxy measure for importance which asked respondents the degree to which they have other places to engage in their primary recreation. The question is hypothetical and somewhat abstract. Perhaps for those reasons, the in-person interview results were significantly different from either of the self-administered methods. Respondents to tablet surveys were much more likely to say that had no or only a few substitutes for their primary recreation than were respondents using other survey methods. Our interviewers encountered numerous cases where subjects seemed to struggle with the intent of the question requiring some clarification. This additional clarification was obviously not a factor for either windshield or self-serve respondents and, therefore, may have contributed to a different result. It is also plausible that the in-person format resulted in social desirability bias by respondents who were reluctant to tell department personnel that they had many substitutes.

Visitation frequency was significantly different among hikers and hunters for different survey methods. For both groups, respondents to questionnaires distributed by windshield routes reported more frequent visits during the fall than did respondents to intercept interviews. In addition, hikers responding via self-serve kiosks said they visited more frequently than hikers who were intercepted by interviewers. Visitation rates for trail bikers were the same regardless of survey method. One possible explanation for differences in the visitation rates by hikers and hunters may be that regular users of the property feel more attachment to the place and, therefore, are more motivated to participate in self-administration survey methods. If that is the case, windshield and self-serve kiosks may be overestimating visitation frequencies.

For hikers and trail bikers, all three survey methods produced similar frequencies of time spent during their visit to the KMSU. For hunters, the windshield survey captured more respondents who hunted longer (4-8 hours). Hunters, especially deer hunters, tend to begin and end the activity at dawn and dusk, time periods outside of the four-hour interview shifts. This may have made them less likely to be intercepted by interviewers, especially during afternoon shifts. Therefore, the windshield survey may have been more effective at capturing individuals hunting longer than intercept interviews. That doesn't fully explain why windshield responses differed from self-serve kiosk responses, other than low sample sizes for the self-serve kiosks may have dampened the ability to detect differences.

Results from the questionnaires showed that group size varied by survey method for hikers and trail bikers, but not among hunters. Differences in group size, though significant, were substantively small for hikers. Among trail bikers, the percentage of solo users was highest for self-serve kiosks and lowest for intercept interviews.

We created an index of the number of activities a respondent selected in completing their questionnaires. We compared those who identified a single focus to those who checked more than one (excluding camping). There were significant differences in results for hikers and hunters depending on survey method. The differences for hikers were especially pronounced where intercept interviews were much more likely to contact a single focused user than were windshield or self-serve kiosk methods. (See Challenges and Lessons Learned for a possible explanation of these differences.)

There also was some measurement error resulting from the presentation of activity options. For example, we observed cases where some pheasant hunters also selected bird watching (n=5) and/or wild food gathering (n=4) in addition to hunting. These cases create some ambiguity between how researchers and participants perceive and self-categorize participation in discrete outdoor activities. Overlap between hiking and dog walking and between camping and horse camping are additional examples of activity types that were not mutually exclusive response options.

Lastly, age data were significantly different for hikers and hunters by survey method; no statistical differences were found for trail bikers. Windshield route and self-serve kiosk returns of hikers and hunters reflected older users than did the results of intercept interviews. This finding is consistent with what is found currently with mail questionnaires where participation rates by younger adults run quite low. The implication of this for collecting property use data is that mail-back or drop-off questionnaires will likely overestimate the behaviors and opinions of older visitors. An alternative explanation for the age differences among survey methods lies with the implementation of intercept interviews. There were quite a few missing values on the age question in this method that may have resulted from interviewers being uncomfortable asking visitors their age or visitors being uncomfortable telling the interviewer their real age. This may have reduced the capture of age data at the older end of the continuum, thereby reducing the average age reported for intercept interviews.

Table 9. Summary of statistical tests comparing responses across survey methods in three different user groups.

User Groups:	Hikers		Trail Bikers		Hunters	
	Sig.	Finding	Sig.	Finding	Sig.	Finding
Time spent	No	n/a	No	n/a	Yes	WS captures a higher % of hunters in 4-8 hour range.
Travel time	No	n/a	No	n/a	No	n/a
Visitation frequency	Yes	WS & SS both captured higher % of high frequency users than TI method	No	n/a	Yes	WS captures higher % of hunters using property several times a week; most TI captures are few times a month
Group size	Yes	WS & SS both captured higher % of large groups, but practical difference was small	Yes	SS had a much higher % of solos users than both WS and TI.	No	n/a
Age	Yes	TI captures higher % of younger users: WS and SS tends older	No	n/a	Yes	TI captures higher % of younger users: WS and SS tends older
Urban/rural	No	n/a	No	n/a	No	n/a
Satisfaction	No	n/a	No	n/a	No	n/a
Substitutability	Yes	TI and SS similar and report high % of no or few subs; majority of WS have some or many	Yes	Differences similar to hikers but less magnitude.	Yes	TI higher % of “no substitutes”
Single activity user	Yes	55% of TI were single activity users compared with 32% (SS) and 20% (WS)	No	n/a	Yes	TI higher % of single activity users.

NOTE: Survey methods are indicated as WS = windshield routes, SS = self-serve kiosks, and TI = tablet intercept interviews.

DISCUSSION

CHALLENGES AND LESSONS LEARNED

As this was a first attempt at deploying different survey methods to capture visitor experiences on the same property, we expected there to be numerous lessons from which future studies would benefit. What follows are the challenges we encountered with the four survey methods and the lessons we learned along the way.

Paper Questionnaire Administration: Due to policies governing how business reply mail can be handled within state government, the return address we used was for the Department of Administration (DOA) not the Department of Natural Resources (DNR). Efforts were made to expedite the delivery of returned questionnaires to the DNR (and specifically to the researchers' address), yet there were challenges in receiving mail in a timely fashion. Although there is no way to know the extent to which mailed questionnaires were not forwarded to the researchers or were sent to the wrong location, there were at least two incidents in which nearly a month elapsed before questionnaires mailed by respondents were delivered to the researchers. In both instances, the questionnaires (47 in one case and 17 in the other) were forwarded by the DOA to unrelated DNR offices without explanation or instruction. In the future, alternative mailing label options would allow completed questionnaires to be more easily directed to the correct personnel.

QR Code Posters: We anticipated this method held potential for yielding a high return relative to cost. The method, however, was so unpopular with property visitors that it failed to yield enough completed questionnaires to enable methodological comparisons. Thus, as a rule, we do not recommend replication of this method on other properties to collect property visitor information.

Self-service Kiosks: The kiosks were installed in locations most likely to be seen by visitors; the transition area between parking lots and trails and near other property information (e.g., trail maps, seasonal closing notices, announcements of upcoming events, and information on management). In hindsight, installing the kiosks near other signage may have hindered their potential effectiveness because frequent users of the property typically do not stop to read property signage – they park and go straight to the trails. It might prove useful to experiment with kiosk locations by installing them away from the parking area and other property signage – perhaps further up a trail at a fork or rest area where their presence may be more noticeable by visitors.

For kiosk installation, rather than a concrete bucket or moveable fixture, we recommend using 8-foot metal posts driven into the ground to reduce potential theft (though we did not experience any theft). We also found that finishing the posters with 10-ply lamination was an effective protection from at least three months of rain and other outdoor weather conditions.

Intercept Interviews: Consistent interview protocol is needed to eliminate variations that may affect responses. For example, how the questions are presented (e.g., read by interviewer to the visitor or the tablet handed to visitors for them to complete), steps to reduce missing data (e.g., asking all questions, including visitor age), who is asked to complete the survey (i.e., being aware of traditional gender roles whereby males may take the lead in unknown situations) and how visitor group size is accommodated (i.e., not purposely skipping groups larger than two or three) should be consistent for all interviewers.

It should be noted that viability of a survey method is dependent, in part, on when that method is applied. This is particularly relevant for the intercept interview method's ability to capture visitors that are on the property for extended periods. For example, hunters likely often arrived prior to the 8:00 a.m. start time and may have left the property after the interviewer shifts concluded. Thus, windshield surveys may be the best option for capturing visitor participation during off-hours.

Intercept interviews were also much more likely to capture single activity users than were windshield or self-serve kiosk methods. We believe this difference may result from two design features of tablet interviews. One relates to how the question appeared on screen in comparison to paper copies. On screen, a long list of choices required scrolling, and thus more effort to visualize and consider. This may have lessened the time spent considering all alternatives. Secondly, protocol for administering interviews varied somewhat by preference of the interviewer. Some interviewers read the list of choices, some showed the list of choices and some allowed the respondent to enter responses on the tablet themselves. This variation could have contributed to results that differed from other survey methods. To avoid response option scrolling, future tablet surveys can be designed with response option lists that easily fit on a single screen shot.

Special Event Opportunities: Future projects could be opportunistic. By that we mean being aware of opportunities to collect information from property users on topics that may be outside a project's original intent. For example, during the September trial period, the KMSU hosted an annual Fall Color Festival as a mountain biking fundraising event. The event provided an opportunity to collect information specific to mountain biking in the KMSU from users of those potentially-affected trails. Because of the unique line of questioning, results of such opportunistic "add-ons" are typically kept separate. That was the case for the Fall Color Festival; results were not (actually, could not be) merged with those of the four methods previously discussed.

FUTURE RESEARCH OPPORTUNITIES

While the intent of this project was not to generate information about the quantity or types of state forest users, the data collected provide important insights into how future survey efforts can help estimate actual use of state properties. With that in mind, we have identified several topics relevant to visitor use of public lands that may benefit from future research.

Replicate methodology on additional state properties: Although the KMSU was selected in part because it could represent different types of department properties, we cannot say with certainty that the methodology conclusions are applicable to other state properties. Hence, the survey methods could be replicated on various types of properties around the state to determine if the methods are equally applicable across property types.

Location of self-service kiosks: As noted above, results from the self-service kiosks may have been hindered by locating the kiosks near other property postings; signage overload may have lowered the likelihood of a visitor noticing the invitation to participate in the survey. Future application of a self-service kiosk survey could experiment with kiosk placement to identify locations that will maximize visitor participation.

Estimating visitor use: This pilot project was not designed to generate estimates of visitor use. Future studies could consider experimenting with various means to quantify how many people visit a property, at what

times, and patterns of use over the course of the year. While each possible approach will have its advantages and disadvantages, some potential tools include traffic counters, electric eye or terrestrial strips on trails, trail cameras, and regimented “bus route” sampling. Visitor counts during designated time periods at sites where self-serve kiosks are placed or that are on windshield distribution routes could enable better comparisons of results with intercept interview surveys.

APPENDICES 1 THROUGH 7

- Appendix 1. Copy of Paper Questionnaire
- Appendix 2. September Windshield Distribution Route Map
- Appendix 3. September Windshield Distribution Instructions
- Appendix 4. September Windshield Distribution Schedule
- Appendix 5. Windshield Survey Distribution Log Form
- Appendix 6. October Windshield Distribution Instructions
- Appendix 7. Observational Data Sheet

APPENDIX 1

COPY PAPER QUESTIONNAIRE (DOUBLE SIDED, TRI-FOLD)

Additional Comments
Do you have other comments about the property or how we could make your visit more enjoyable?

For additional information about this or other properties, visit our website at dnr.wi.gov and search for "SCORP" or "Public Lands"

Questions and comments about this survey can be directed to Social Science Survey Clearinghouse at (608) 266-8523 or scshq@ssc.socsci.wisc.edu

SS-1167-2016



State of Wisconsin
Department of Natural Resources
101 South Webster St.
P.O. Box 7921
Madison, WI 53707-7921

POSTAGE WILL BE PAID BY ADDRESSEE

Department of Natural Resources
Attn: J. Petchenik
101 South Webster Street - SS/7
PO Box 7921
Madison, WI 53707-7921

Welcome to the Southern Unit-
Kettle Moraine State Forest!

Please take a moment to help us better understand how the DNR can make your experiences at this property even more enjoyable. Simply complete the questionnaire inside, seal it with the attached tabs and drop it off in a designated survey collection box at the State Forest, or any US Postal Service mailbox for pickup (no postage necessary if mailed within the United States). Please only fill out one survey per group, per visit to the KMSF. Thank you for supporting the DNR in providing the citizens of the state with a full range of outdoor opportunities.

Sincerely,
Anne Korрман
Superintendent
Southern-Unit Kettle Moraine State Forest

Instructions: Please complete this survey at the conclusion of your visit, only one survey per visit. Your input is important in helping planning efforts for the Southern Unit - Kettle Moraine State Forest (KMSF).

Please fill in today's date (day of your visit to the KMSF): _____ (month/date)

1. About how much time did you spend at the KMSF today? (check one)
 - Less than 1 hour
 - 1- 4 hours
 - 4 - 8 hours
 - More than 8 hours

2. How long did it take you to reach the KMSF from your home (or place of lodging)?
 - Less than 30 minutes
 - 31 - 59 minutes
 - 1 - 2 hours
 - 2-4 hours
 - More than 4 hours

3. Please circle ALL of the activities that you have participated in today at the KMSF. (circle all that apply)

a. Biking (roads)	h. Geo-caching	o. Pleasure driving
b. Biking (trails)	i. Hiking/Walking	p. Pokémon Go
c. Bird watching	j. Horseback riding	q. Running
d. Camping	k. Hunting	r. Swimming
e. Dog training	l. Naturalist / Park led programs	s. Viewing fall colors
f. Dog walking	m. Photography	t. Visiting Headquarters /Museum
g. Fishing	n. Picnicking / Cookout	u. Wild food gathering
		v. Wildlife watching
w. Other activity (please describe)_____		

4. From the above list, what is the ONE activity that you would say is the primary purpose of your visit? In the space below, write the letter of the corresponding activity from the above list.
 Activity _____ is the primary purpose for my visit today.

5. Considering all places you participate in the activity identified in question 4 as your primary recreation at KMSF, how many substitutes do you have for participating in that activity at KMSF? In other words, if the KMSF was no longer available to you, how many places in Wisconsin would you have to participate in that activity? (check one)
 - I have **no** substitutes for KMSF
 - I have **some** substitutes for KMSF
 - I have **only a few** substitutes for KMSF
 - I have **many** substitutes for KMSF

6. How frequently do you typically visit KMSF during the fall (September - November)? (check one)
 - More than once a week
 - Once a month (2-3 times for the season)
 - Once a week
 - Once per season
 - A few times per month
 - This is my first time visiting KMSF during the fall

7. Overall, how satisfied are you with your visit to KMSF today? (check one)
 - Very satisfied
 - Neither satisfied nor dissatisfied
 - Fairly dissatisfied
 - Fairly satisfied
 - Very dissatisfied

8. There are numerous ways that public funding can be spent on state parks. Funding, however, may not always be available to support all user desires. From the list below, please check the TWO attributes for the KMSF that are most important to you. (check TWO items)

<input type="checkbox"/> Maintain signage and education materials	<input type="checkbox"/> Maintain trails
<input type="checkbox"/> Upgrade infrastructure (ex., buildings, roads)	<input type="checkbox"/> Increase remote camping sites
<input type="checkbox"/> Improve fish & wildlife habitat	<input type="checkbox"/> Provide flush toilets
<input type="checkbox"/> Provide naturalist/park led programs	<input type="checkbox"/> Maintain the museum
<input type="checkbox"/> Provide electrical hook-ups	

9. Have you completed this survey this year during other visits to KMSF? Yes No

10. How many people are in your group today, including yourself? Total group size: _____

11. What is your gender? Male Female

12. What is your age? _____ years

13. What setting best describes where you live now? (check one)
 - Rural, farm
 - Rural, non-farm
 - Suburban / Urban

14. In which Wisconsin county do you live? _____ If you do not live in Wisconsin, check here

Thank You for Completing the Survey!

If there is anything more you'd like to say about the KMSF, please use the inside panel for additional comments. Seal this survey using the attached adhesive tabs, and place in a designated survey dropbox or send in the US Mail.

APPENDIX 3

SEPTEMBER WINDSHIELD DISTRIBUTION INSTRUCTIONS

Kettle Moraine Southern Unit - Visitor Use Study 2016

Directions for Windshield Surveys

1. Do not run windshield survey if it is raining at beginning of scheduled route.
2. The route for windshield surveys features six designated locations that should be checked once during every driving shift. The six stops can be made in any order.

The six locations (see map) are:

- Emma Carlin Hiking and Biking Parking Lot
- Eagle Horse and Snowmobile Trail
- Ice Age Parking lot on Highway 67
- Scuppernong Skiing and Hiking Trail Parking Lot
- Hunter Parking Lot on Hwy ZZ
- Ottawa Lake Campground

3. Every vehicle that is encountered in each of these lots should receive a windshield survey, with the exception of Ottawa Lake Campground which will be discussed momentarily. If no vehicles are present at a designated parking area, the driver should move on.

4. The route driver should complete a log for the surveys dropped during each trip making sure to note the number codes of surveys left at each location (see log). Number codes for surveys are printed **in the lower right hand corner**.

5. At Ottawa lake, no more than 50 windshield surveys should be distributed per day. Surveys should be placed on vehicles in a variety of locations during each shift (e.g., campground loop, beach, woodshed/visitor office, etc.). For example, if the campground is full, the driver may want to place surveys on every 4th campsite, saving some of total daily allocation of surveys (50) for other areas within Ottawa Lake. It is not necessary to distribute 50 at Ottawa Lake if there are not 50 vehicles present. It is also not necessary to circle back to an area to fill the quota.

6. Time and opportunity permitting, drivers are encouraged to place surveys on vehicles encountered in other places in the northern part of the property (see map for cut-off line), including vehicles parked along roadways. Again, survey number codes and locations need to be recorded.

7. Within the windshield survey area, there are also four closed areas, where windshield surveys should never be placed. Three of these areas all have self-service survey kiosks instead. The four NO-windshield locations are:

- Ottawa Horse and Snowmobile trail
- Hunter Parking lot off Hwy 67
- Forest headquarters
- McMiller Shooting Range

APPENDIX 4

SEPTEMBER WINDSHIELD DISTRIBUTION SCHEDULE

SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.
September 2016				1	2 INT	3 WIND
4	5 INT	6 WIND	7	8 WIND	9 INT	10 WIND
11 INT	12 WIND	13 INT	14 WIND	15 WIND	16 INT	17 INT
18 WIND	19 INT	20 WIND	21 WIND	22 INT	23 WIND	24 INT
25	26 INT	27 WIND	28 INT	29 WIND	30 INT	
Notes: INT=Interview days WIND= Windshield survey days AM shift (above hash line)~ 9am-1pm PM shift (below hash line)~1pm-5pm						

APPENDIX 6

OCTOBER WINDSHIELD DISTRIBUTION INSTRUCTIONS

Kettle Moraine Southern Unit- Visitor Use Study 2016

Directions for October Roving Windshield/Interview Surveys

1. Roving route drivers are encouraged to place surveys on vehicles in the parking lots below, as well as vehicles encountered in other places in property, including vehicles parked along roadways which are adjacent to state land. Locations in addition to the following are also highlighted on the map.
 - Emma Carlin Hiking and Biking Parking Lot
 - Eagle Horse and Snowmobile Trail
 - Ice Age Parking lot on Highway 67
 - Scuppernong Skiing and Hiking Trail Parking Lot
 - Hunter Parking Lot on Hwy ZZ
 - Ottawa Lake Campground
2. Every vehicle that is encountered in each of these lots or along the roadside on state land should receive a windshield survey, if there is no person present. If a person is present, attempt to complete an 'interview survey' via tablet.
3. If no vehicles or people are present at a parking lot area, the driver should move on.
4. The roving driver should complete a log for the surveys dropped during each trip making sure to note the number codes of surveys left at each location (see log). Number codes for surveys are printed on the inside of the survey, lower right corner (after the 'additional comments' section).
5. Within the roving route, there are also closed areas, where windshield surveys should never be placed. Some of these areas all have self-service survey kiosks instead of receiving windshield surveys. These are indicated on the map in blue and red circles. The NO-windshield locations area:
 - Ottawa Horse and Snowmobile trail
 - Hunter Parking lot off Hwy 67
 - Forest headquarters
 - McMiller Shooting Range
 - Ottawa Lake Campground
6. Limit interview time at known high use areas (ie. John Muir biking trails, Nordic hiking trails, Emma Carlin trails, Eagle Horse trails etc.) to no more than 15 minutes
7. Completing entire route(s) is not necessary - priorities are to increase number of surveys distributed to dispersed use visitors (ie. Hunters, naturalists, pleasure drivers/leaf peepers, other uses not captured in designated areas) – time should be distributed based on the interviewer's best judgment on what will achieve this goal.

APPENDIX 7 OBSERVATIONAL DATA WORKSHEET

SCORP Property Use Study/ Interviewer Observation Form

Interviewer name:

Date:

Location:

Start time:

Weather:

End time:

Data count directions

- 1 "Parked" means passenger(s) are observed leaving for or returning from some activity, as well as vehicles empty for entire interview periods.
- 2 "Drive-throughs" include the following situations: vehicles turning around, people getting out briefly to look at map or use rest room, people sitting in their cars without exiting.
- 3 We need to estimate "party size" per vehicle. Consider only parked vehicles, not drive-throughs. Count the number of people exiting or returning to each parked vehicle and write the number in each blank

OBSERVATION COUNTS (record as tally marks)									Totals
# of passenger vehicles parked ¹									
# of motorcycles parked									
# passenger vehicle drive-throughs ²									
# of motorcycle drive-throughs									
# of individuals arriving to sample location by foot or bike									
	<i>Record a whole number for each party observed entering or exiting a parked vehicle</i>								
Number of people riding per passenger vehicles ³									

Comments:

ADDENDUM

FALL RECREATION ON THE KETTLE MORaine STATE FOREST - SOUTHERN UNIT

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Bureau of Environmental Analysis and Sustainability

November 2017

During September and October 2016, we conducted an in-depth study to test and compare various methods of collecting information from and about people recreating on the Southern Unit of the Kettle Moraine State Forest (KMSU), headquartered near Eagle, Wisconsin in Waukesha County. The KMSU encompasses over 22,000 acres of rolling, glacial hills intermixed with prairies and several small lakes. The Wisconsin DNR manages the property for multiple-use recreation with extensive infrastructure including four campgrounds, hundreds of miles of trails for hiking, biking, cross country skiing, snowmobiling and horseback riding. Hunters make extensive use of the property in spring and fall with deer, turkey, and pheasant attracting much of the attention. The size and diversity of property features made it an ideal location for us to pilot test a program for collecting visitor use data. The project was funded primarily with federal dollars made available to support the State Comprehensive Outdoor Recreation Plan (SCORP).

A detailed explanation of the methodology including the rationale for why the KMSU was selected is included in a separate report (Petchenik et al. 2017). In short, we surveyed over one thousand people using several techniques including in-person interviews, windshield surveys, and self-service survey kiosks. The primary purpose of this research was to evaluate the cost-effectiveness and data quality of the survey methods. Therefore, the design did not permit us to estimate the number of users of various recreation types. Choices of survey locations and sampling times were purposive and not random, therefore we likely under-sampled from some types of users (e.g., anglers, campers) relative to their proportion of use. Despite this limitation, the data we collected do shed some light on the profiles of the recreation users at the KMSU. This report presents results from what we learned about KMSU property users during our experiment.

QUICK FACTS

- Slightly more than one in three (34%) visit the KMSU alone and 41 percent visit with a companion; one in four are in groups of three or more people.
- About six in ten (61%) visitors live in an urban area.
- Overall, men made up slightly more than half (56%) of recreationists on the property. If you exclude hunting from the analysis, the gender composition of all other activities is 50/50.
- A majority (56%) of campers travel at least an hour to visit KMSU.
- Over half (52%) of the campers camp in pairs; only eight percent camp solo.
- Campers are statistically more likely than day-use visitors to participate in road biking, bird watching, dog walking, fishing, geocaching, hiking, horseback riding, photography, picnicking, pleasure driving, swimming, and wildlife viewing.
- Day-users are statistically more likely than campers to participate in hunting and running.

PRINCIPLE FINDINGS

Finding #1- Much of the “visitor” use on the property is from area residents.

Thirty-two percent of the property users that responded to surveys lived in Waukesha County, 14 percent resided in Walworth County and ten percent were from Milwaukee County. Three out of four people we captured in this study lived within one hour of the KMSU. About 38 percent of the survey respondents live less than 30 minutes from the property. Among day trippers (those who are not camping during their stay), 44 percent lived within a 30-minute radius of the property. This observation was underscored for the research team during one of our initial parking lot interviews when we approached a person and explained we were interviewing “visitors” for a study. The subject declined by informing us that he was not a visitor, that the Kettle was “part of my backyard.” (We modified our approach after that contact.)

Among all property users, 19 percent drive between one and two hours to get to the KMSU. Only about six percent drive longer than two hours for their visit. Nineteen percent of the fall visitors to the KMSU are from out state, and the vast majority of these people hail from Illinois.

Finding #2- Property users are “regulars,” in addition to being from the area.

Sixty-two percent of people living within a 30-minute drive of the KMSU told us they visit at least once a week during the fall. The majority of the weekly visitors (61%) are urbanites. Most day-users (74%) spend between one and four hours of time each time they visit. The research team observed a number of the same people on multiple occasions running, hiking, or dog walking on the trails. About ten percent of the visitors were encountered again at a later date after their initial survey completion.

Finding #3- Recreation users love and depend on the property.

Ninety-six percent of survey respondents were satisfied with their visit to the KMSU on the day of their survey. High levels of trip satisfaction were uniform across types of recreation and showed no statistical differences by method of survey administration.

As a measure of the importance of the property, we asked visitors how many substitute places they had in the hypothetical scenario where the KMSU was not available for their primary recreation interest (whatever they were there for on the day of the survey). Thirty-nine percent of respondents said they had “*only a few other places*” to pursue their primary outdoor recreation; 24 percent said they had *no other* places to go do what they most liked to do.

The activities with the highest frequency of respondents who said that had *no other substitutes* for the KMSU were: hunting (36%), wild food gathering (34%), dog training (33%), horseback riding (32%) and swimming (32%).

Finding #4- Trails are the highest visitor priority.

We also asked survey respondents where park administrators should prioritize limited budget resources among a closed set of nine options. Each respondent was directed to select their top two priorities from the list. Seventy-seven percent of day-users in the study selected “maintaining trails” as their top priority for funding (Figure A1). A majority of campers—most of whom reported hiking during their stay—also selected trail maintenance most often (54%). Campers were slightly more likely than day users to select flush toilets and electrical hook-ups in the campgrounds. Campers were also about twice as likely to prioritize park-led naturalist programs as were day-users.

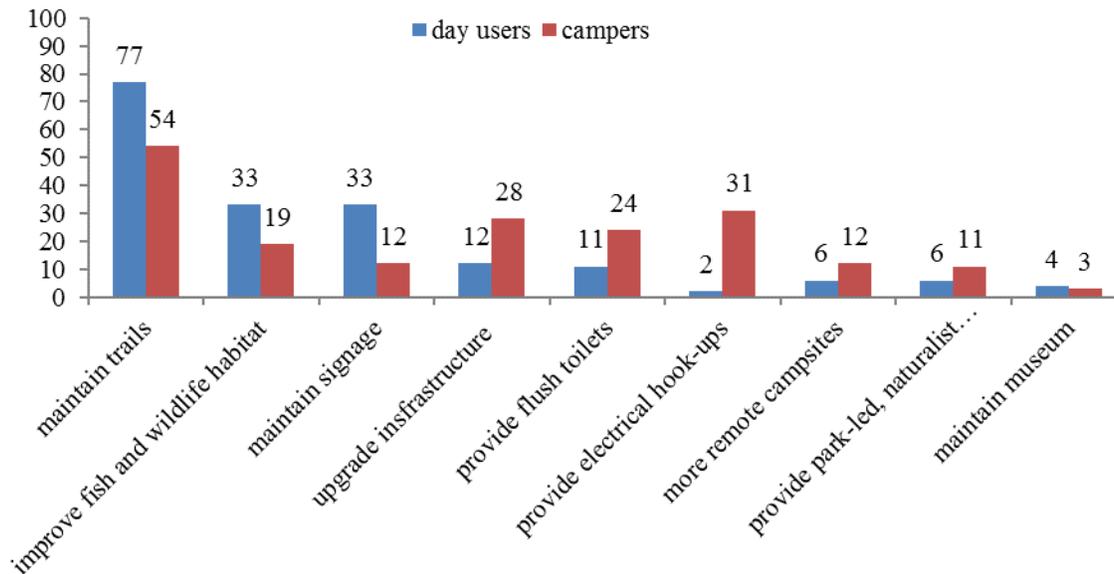


FIGURE A1. The percentage of property users selecting their priorities for allocating budgets at the KMSU.

GROUP PROFILES

While we cannot calculate absolute visitor estimates, it is safe to conclude that hiking/walking on trails was the most popular recreation on the KMSU during the months of September and October combined. In fact hiking was identified about three times more often than the next closest activity. Hunting, horseback riding, and trail biking, comprised the top four day-use activities. Each of these four popular recreations was pursued by different population segments. We provide a short profile sketch of each one below.

- Hikers: Middle-aged, urban, men and women, group participation (Figure A2)
- Horse riders: Older, rural, women, group participation, combined camping (Figure A3)
- Hunters: Older, urban, local, solo, males (Figure A4)
- Trail bikers: Younger, urban, solo, males (Figure A5)

LITERATURE CITED

Petchenik, J., R. Holsman, C. Harris, and J. Pohlman. 2017. Public Lands Visitor Survey: A Methodological Comparison Pilot Project at the Southern Unit of the Kettle Moraine State Forest. PUB-SS-1181. Bureau of Environmental Analysis and Sustainability, Wisconsin Department of Natural Resources, Madison, WI.

Activity: HIKING

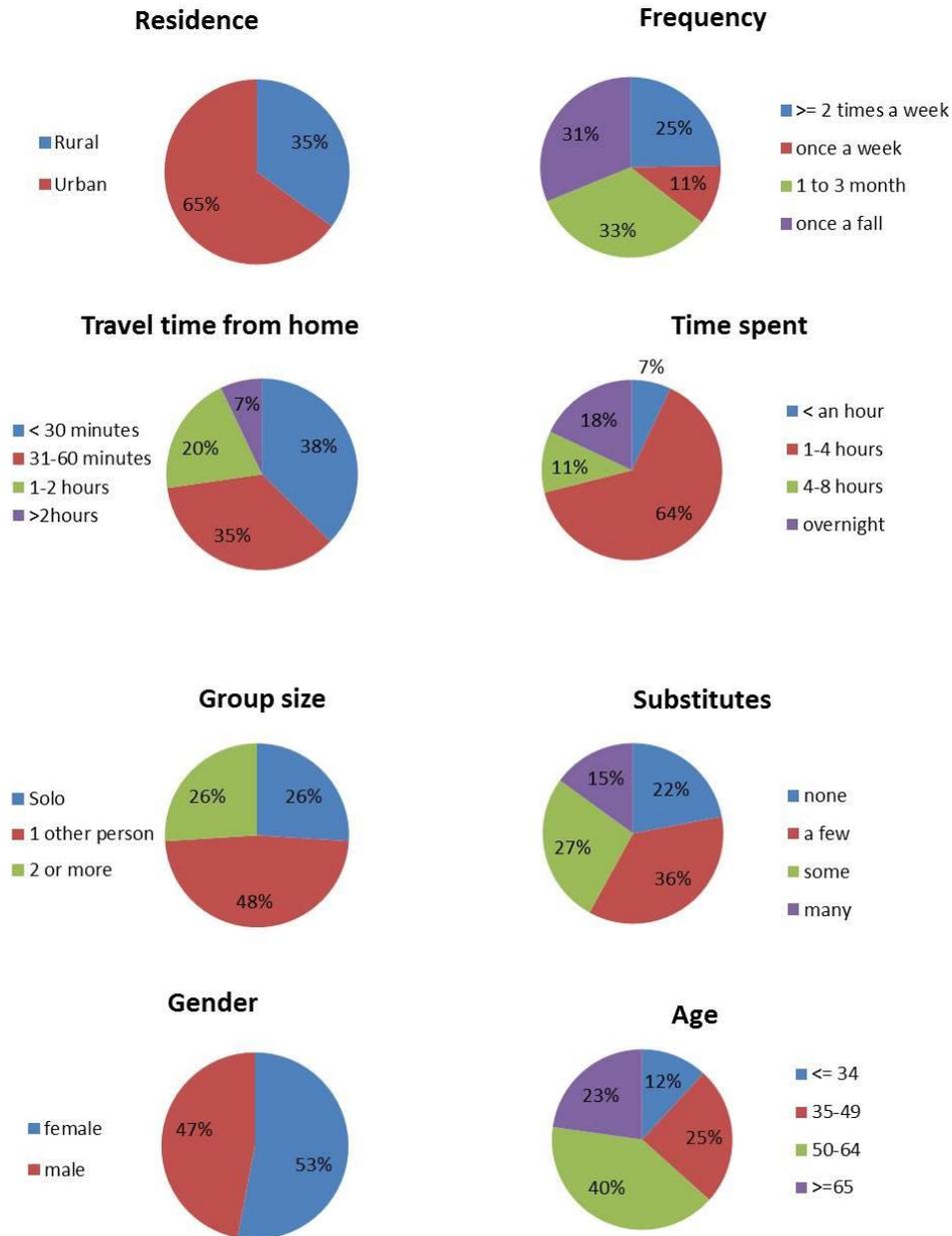


FIGURE A2. Frequency of select demographic and participation characteristics of hikers at the KMSU, fall 2017.

Activity: HORSE TRAIL RIDING

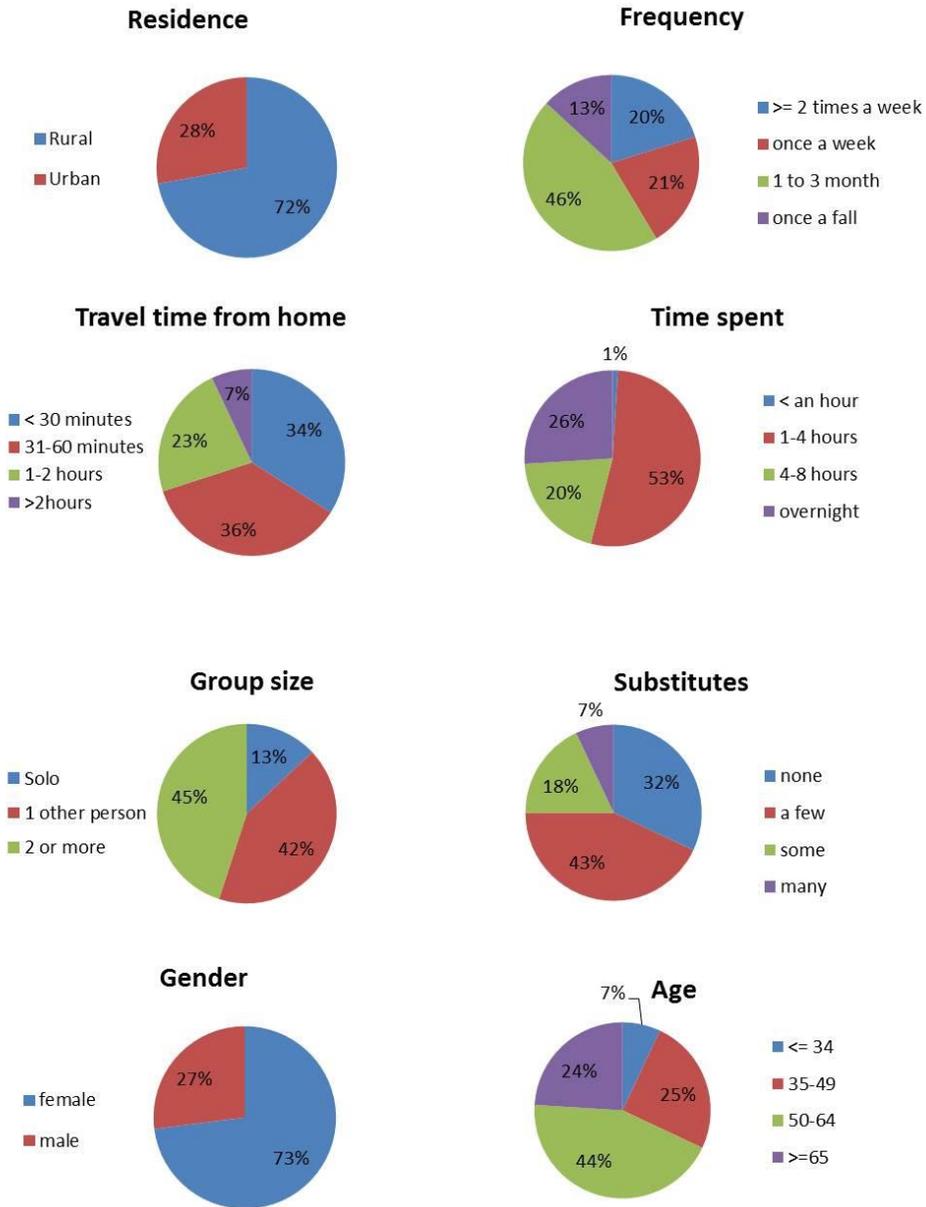


FIGURE A3. Frequency of select demographic and participation characteristics of horse trail riders at the KMSU, fall 2017.

Activity: HUNTING

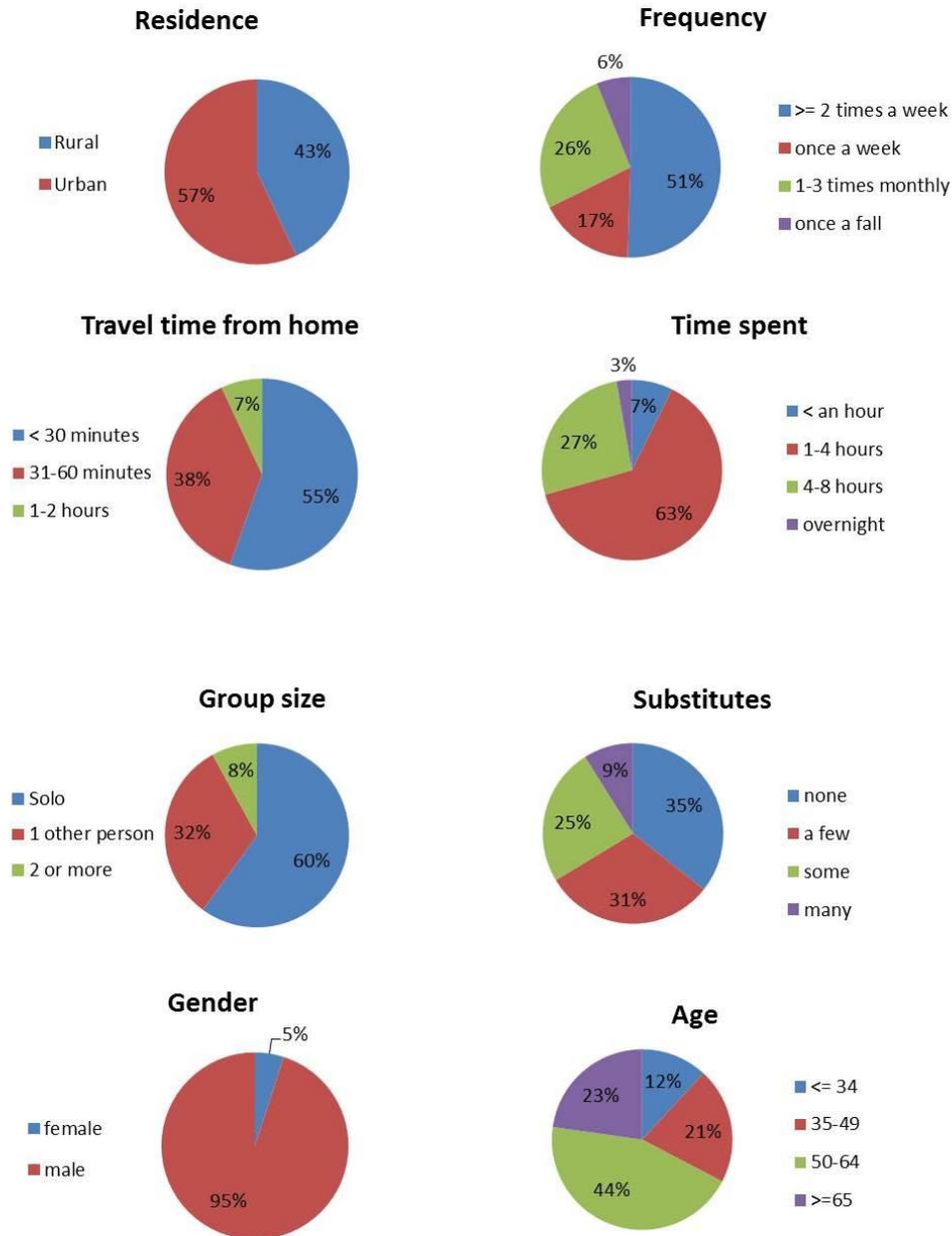


FIGURE A4. Frequency of select demographic and participation characteristics of hunters (includes all types) at the KMSU, fall 2017.

Activity: TRAIL BIKING

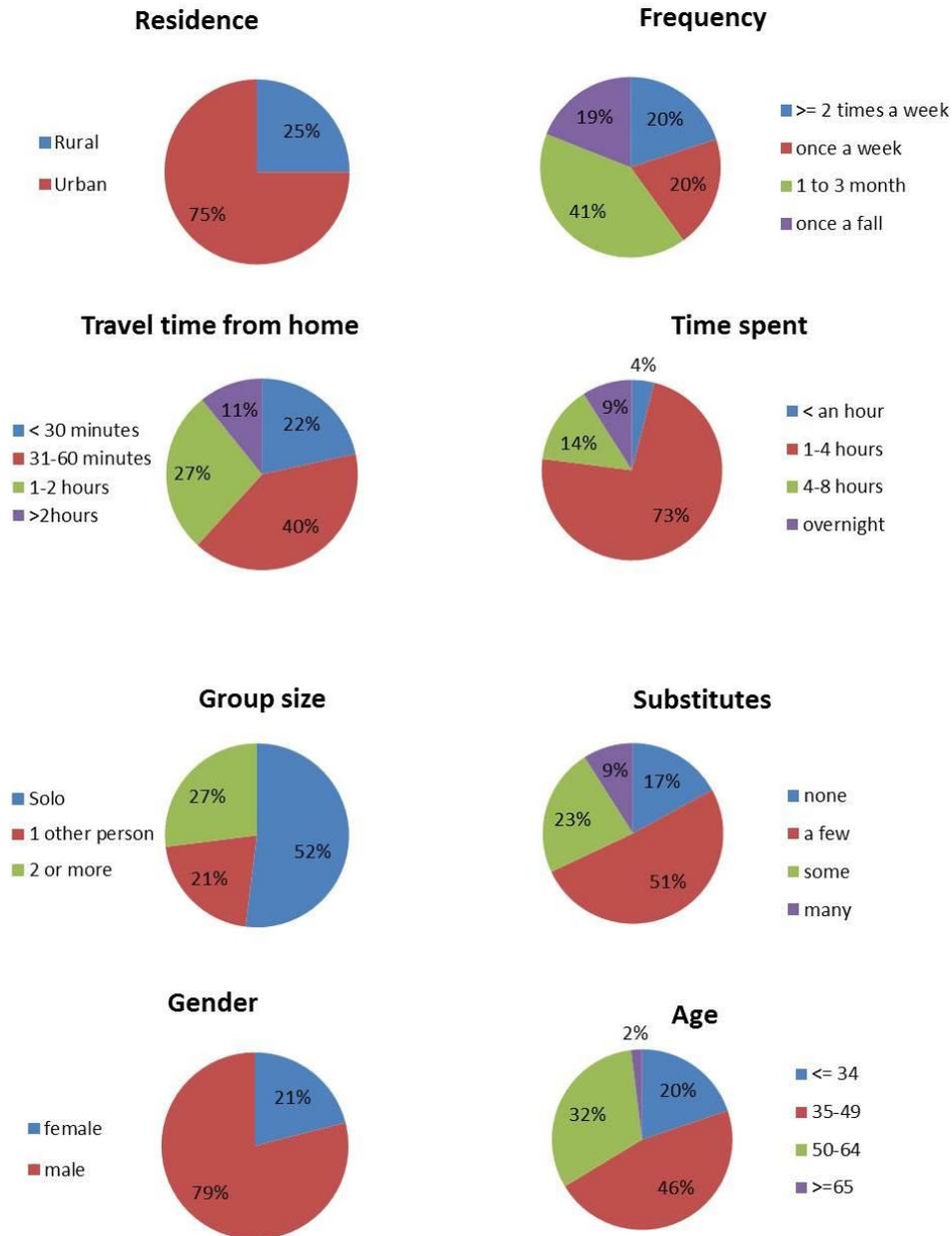


FIGURE A5. Frequency of select demographic and participation characteristics of trail bikers at the KMSU, fall 2017.