

LINKAGES IN THE USE OF RECREATION ENVIRONMENTS ACROSS THE URBAN TO EX-URBAN SPECTRUM BY URBAN RESIDENTS

John F. Dwyer

Research Forester, USDA Forest Service, North Central Research Station, 845 Chicago Avenue, Suite 225, Evanston, IL 60202

Susan C. Barro

Research Social Scientist, USDA Forest Service, North Central Research Station, 1992 Folwell Avenue, St. Paul, MN 55108

Abstract: A study of recreation behavior of residents of Cook County, Illinois was conducted in early 1999. Respondents were contacted via telephone and surveyed about their awareness and use of outdoor recreation sites in and around Chicago and as far away as the Shawnee National Forest in Southern Illinois. The sample was selected using random digit dialing and a quota for each of three specific groups: Non-Hispanic White Americans (n=618), African Americans (n=647), and Hispanic Americans (n=346). Responses to questions about visitation to 20 recreation sites within the last 12 months were factor analyzed revealing 5 site factors. The factors varied in the type of experiences provided, level of naturalness, and proximity to Chicago. In other analyses we examined awareness and use of recreation sites by race/ethnicity, place of residence, and other demographic variables. Results not only elucidate participation patterns but also have important implications for site managers who may want to coordinate their outreach efforts with other sites to encourage greater awareness of recreation opportunities, higher levels of use, and greater interaction with natural resource management and use.

Introduction

Urban residents are playing an increasingly significant role in the development of management programs and policies for natural resources. This is prompting those who develop policies and programs for natural resources to work to increase the interactions that urban residents have with natural resources and their management and use. Many natural resource planners and managers believe that nature based recreation experiences in urban areas pave the way for urban residents to learn about, care about, and even become an advocate for nature in urban and ex-urban areas. In light of the purported synergism, regional resource stewardship initiatives, such as Chicago Wilderness (Ross, 1997), have worked to link the programs of land management, outdoor recreation, education, and research in building support for regional biodiversity. In this way, they can repeat a consistent message across venues thus reinforcing knowledge and strengthening support for nature and natural places. The success of these efforts depends in part on understanding what sets of sites are used by the same people. Knowing this will help in honing consistent messages across sites. One day, recreation site managers

may be able to employ the tools of niche marketing used by companies such as Amazon.com, the internet bookseller, where recommendations for new books are made based on knowledge of past book purchases.

Cook County, in northeastern Illinois, is an ideal place to examine recreation site linkages and group preferences for site types because it is racially/ethnically diverse and offers a wide variety of recreation opportunities. Cook County occupies the inner core of the 13 - county Chicago Metropolitan area, and with a population of 5.5 million people, is home to almost 60% of the metro area residents. Recreation sites available in Cook County include city parks, county forest preserves, state and federal parks, zoos, museums, arboreta, a botanic garden, and conservatories. A national forest, the Shawnee, is located in southern Illinois. For this study the Chicago-area sites were chosen as representative of the diverse range of natural resource - related opportunities available in and beyond the Chicago area that might be considered for "urban outreach" efforts. The Shawnee National Forest was included because it is the only national forest in the state.

Our objectives were to identify the patterns of use across the twenty recreation sites and assess how site use varied by racial/ethnic group, place of residence, and a variety of other demographic characteristics. Results of this study can help improve outreach to urban residents as well as guide policies aimed at providing information about outdoor recreation, environmental education, and resource management at urban sites.

The Sample

We sampled Non-Hispanic Whites, African Americans, and Hispanic Americans from the population of Cook County, Illinois using random digit dialing and a quota for each group. Our sample targets were 600 Non-Hispanic Whites, 600 African Americans, and 300 Hispanic Americans. Our final sample included 618 Non-Hispanic Whites, 647 African Americans, and 346 Hispanic Americans. Only heads of households were interviewed, alternating between males and females. Spanish speaking interviewers were on hand, if needed, to conduct interviews with Hispanic respondents.

The Survey Instrument

The survey instrument was patterned closely after the Illinois SCORP (Statewide Comprehensive Outdoor Recreation Participation) Survey that is conducted every few years by the Illinois Department of Natural Resources. The survey included questions about participation in different activities, preferences for site attributes, preferences for levels of naturalness, and visits to recreation areas outside Illinois (Dwyer & Barro, 2001). The analysis described in this paper is based primarily on responses to questions about visits to 20 different recreation sites (19 located in or near the Chicago Metropolitan area and the Shawnee National Forest in Southern Illinois) (Figure 1). Basic demographic information gathered included race/ethnicity, zip code, age, gender, income level, and number of people in the household.

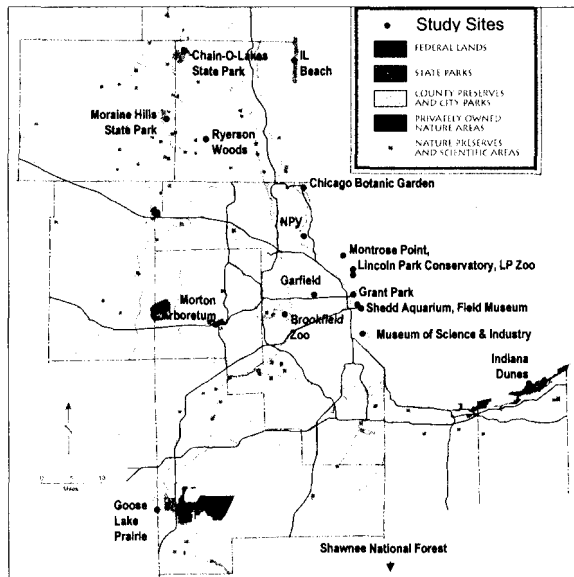


Figure 1. Chicago Area Study Sites

Analysis

We looked at visitation (visited or not visited in the previous 12 months) to twenty recreation sites to begin to examine recreation site use patterns of Cook County residents. While we over-sampled African Americans and Hispanic Americans in the data collection, the analyses presented here are based on observations that were weighted to reflect the population of Cook County, Illinois. We used factor analysis with varimax rotation to identify what sites showed similar use patterns. In other analyses, we examined use of site types by racial/ethnic group, place of residence, gender, age, income, and education.

Results of Factor Analysis

Five factors, explaining 48 percent of the variance, emerged from the analysis of visitation data when the entire sample was analyzed (Table 1). The pattern of site clustering revealed the following: (1) sites in close proximity to each other tended to load on the same factor (e.g., groupings of urban sites, suburban sites, and ex-urban

Table 1. Factor Analysis of Visitation to Sites During the Past 12 Months, Entire Study Sample

Factor label: Sites	Factors				
	I.	II.	III.	IV.	V.
Downtown Sites					
Museum of Science and Industry	.782	.128	.073	-.021	-.052
Field Museum of Natural History	.762	.159	.059	.024	.026
Shedd Aquarium	.714	.146	.082	.006	.090
Brookfield Zoo	.650	.049	.135	.096	.026
Indiana Dunes National Lakeshore	.468	.080	.356	.157	-.152
Grant Park	.458	.390	.012	.023	.031
Near-North Side					
Lincoln Park Conservatory	.247	.724	.039	-.062	.034
Montrose Point (Lincoln Park)	.022	.594	.089	.049	.058
Lincoln Park Zoo	.413	.577	-.042	-.035	-.100
North Park Village Nature Center	-.086	.517	.217	.202	-.024
Garfield Park Conservatory	.252	.448	.018	.045	-.013
Far-North Sites					
Ryerson woods	-.021	.176	.691	-.160	.075
Illinois Beach State Park	.213	.117	.632	.109	-.078
Chain-O-Lakes State Park	.157	-.036	.579	.144	.191
Moraine Hills State Park	.035	.035	.525	.405	-.147
Ex-Urban Areas					
Shawnee National Forest	.070	-.037	.057	.730	.100
Goose Lake Prairie	.034	.179	.088	.726	-.031
Arboretum/Botanic Garden Sites					
Morton Arboretum	.162	.195	.184	.167	.672
Chicago Botanic Garden	.319	.370	.241	.109	.403
Midewin National Tallgrass Prairie	.112	.210	.174	.139	-.579
Eigenvalue	4.52	1.75	1.29	1.06	1.01
Percent variance	22.6	8.7	6.4	5.3	5.1

sites), and (2) sites that provided similar experiences (e.g., an arboretum and a botanic garden) or had similar levels of naturalness loaded on the same factor. The five factors were subsequently labeled: I. Downtown Sites, II. Near-North Sites, III. Far North Sites, IV. Ex-Urban Sites, and V. Arboretum/Botanic Garden Sites and are described below.

Downtown Sites (I) -- This factor explained the largest portion of the variance. Six sites loaded strongly on this factor. Three of the six sites were museum-type sites located in downtown Chicago: The Museum of Science and Industry, the Field Museum of Natural History, and the Shedd Aquarium. Grant Park is a large lakefront park immediately adjacent to the Field Museum. It is also the site of many festivals. Brookfield Zoo, located 15 miles west of downtown Chicago, fits with the museum-type attractions (i.e., a museum with live animals) that make up a significant portion of the factor. However, Lincoln Park Zoo, which is located closer to downtown than Brookfield Zoo, loaded more strongly on the second factor (Near-North Sites). Indiana Dunes National Lakeshore, located approximately 47 miles southeast of downtown Chicago was the final site to load on this factor.

Near-North Sites (II) -- This factor was composed of five sites including three in Chicago's Lincoln Park: Lincoln Park Zoo and Lincoln Park Conservatory (located just north of downtown Chicago), plus Montrose Point which is located just north of the zoo and conservatory on Lake Michigan. Also included in this factor is North Park Village Nature Center, which is located 12 miles northwest of the city center, and Garfield Park Conservatory, which is west of downtown Chicago and is similar to the Lincoln Park Conservatory.

Far-North Sites (III) -- This factor includes a county forest preserve site (Ryerson Woods), and three Illinois state parks (Illinois Beach State Park, Chain-O-Lakes State Park, and Moraine Hills State Park) -- all located north or northwest of Chicago. Ryerson Woods is in suburban Lake County, while the state parks are in predominately rural areas of Lake and McHenry Counties.

Ex-Urban Areas (IV) -- This factor includes the Shawnee National Forest and Goose Lake Prairie State Park. The Shawnee is located 342 miles south of Chicago and the Goose Lake Prairie 57 miles southwest of Chicago. While the Shawnee is far more extensive than Goose Lake Prairie State Park, both offer natural environments and substantial opportunities to observe wildlife and to fish and hunt.

Arboretum/Botanic Garden Sites (V) -- This factor is composed of two sites: The Chicago Botanic Garden and The Morton Arboretum, both of which offer unique opportunities to experience a wide variety of native and non-native plants as individuals and in landscapes. The Chicago Botanic Garden is 22 miles north of the center of Chicago and Morton Arboretum some 27 miles southwest. Midewin National Tallgrass Prairie had a strong negative loading on this factor that was not easily explained. Given low participation data for that site (Table 2), it was dropped from the analysis.

Table 2. Percent of Respondents in Each Racial/Ethnic Group Who Reported Visiting Study Sites in the Previous 12 Months

Sites	Anglo American	African American	Hispanic American
Downtown Sites			
*Museum of Science and Industry	52	59	45
Field Museum of Natural History	48	51	46
Shedd Aquarium	45	51	50
Brookfield Zoo	51	52	50
Indiana Dunes National Lakeshore	26	24	21
*Grant Park	62	72	59
Near-North Side			
Lincoln Park Conservatory	24	25	30
Montrose Point (Lincoln Park)	19	14	20
*Lincoln Park Zoo	44	53	59
North Park Village Nature Center	6	5	5
*Garfield Park Conservatory	10	33	10
Far-North Sites			
Ryerson woods	4	3	1
Illinois Beach State Park	45	22	18
*Chain-O-Lakes State Park	24	5	6
Moraine Hills State Park	5	3	3
Ex-Urban Areas			
Shawnee National Forest	6	4	3
Goose Lake Prairie	4	3	3
Arboretum/Botanic Garden Sites			
*Morton Arboretum	22	6	8
Chicago Botanic Garden	30	24	25
Midewin National Tallgrass Prairie	2	4	3

*Chi-square test indicated significant differences (P<.05)

Who visits the sites?

We looked at visitation in several ways to determine if there were patterns of visitation to site types by different groups. First, we looked at visitation by race/ethnicity with the three groups in the study, i.e., Non-Hispanic Whites, African Americans, and Hispanic Americans (Table 2). Second, we looked at visitation to sites by place of residence. Residence locations were determined by zip code and five groups were distinguished -- Northern Suburbs, North Chicago, Central Chicago, South Chicago, and Southern Suburbs (Table 3). Finally, we looked at visitation by demographic categories (age, gender...).

Downtown Sites -- All of the sites that loaded on this factor are well known and draw users from wide-ranging areas of Chicago. Brookfield Zoo and Indiana Dunes National Lakeshore tend to draw more heavily from the south suburban areas than the other sites in the cluster. Sites that loaded on this factor had relatively high use rates for people under 40 years old and particularly high use rates for African Americans and Hispanic Americans.

Near North Sites --The three Lincoln Park sites that loaded on this factor draw a substantial portion of their visitors from north and central Chicago and the Chicago suburbs, and have a relatively high visitation rate by African Americans and Hispanic Americans. North Park Village, a relatively new and fairly small site, draws primarily from the northern part of Chicago, while Garfield Park Conservatory draws from across Cook County; but particularly its southern areas.

Far North Sites -- All sites that loaded on this factor tend to draw visitors heavily from the northern suburbs. In addition, these sites had higher visitation rates for Non-Hispanic Whites than African Americans or Hispanic Americans.

Ex-Urban Areas -- The Shawnee National Forest tended to draw most of its visitors from the south suburbs, as did the Goose Lake Prairie. Both sites had relatively high visitation rates by Non-Hispanic Whites and males.

Arboretum/ Botanic Garden -- Both sites tend to draw visitors with special interests concerning plants who may be willing to travel substantial distances to visit them. Residents of the northern suburbs are drawn to both sites, while residents of the southern suburbs tended to visit Morton Arboretum. Both sites tend to draw a high proportion of older respondents, and those with high levels of education. The Chicago Botanic Garden has relatively high participation rates for African American and Hispanic American respondents as compared to the Morton Arboretum.

The site groupings that resulted from the factor analysis are supported, in part, by previous research by Lin et al. (1988) who grouped Chicago-area sites based on perceived attributes. They produced three groups that included; (1) Morton Arboretum and Chicago Botanic Garden; (2) Lincoln Park Conservatory and Garfield Park Conservatory; and (3) seventeen Forest Preserve sites from across the Chicago area. These groupings proved useful in their efforts to develop a nested site choice model for those sites.

Table 3. Residence of Respondents Who Reported Visiting Study Sites in the Previous 12 Months, by Area of Residence (Percent of Respondents)

Sites	Areas				
	Northern Suburbs	North Chicago	Central Chicago	South Chicago	Southern Suburbs
Downtown Sites					
Museum of Science and Industry	23	20	16	18	24
Field Museum of Natural History	24	21	15	17	24
Shedd Aquarium	23	19	17	17	23
*Brookfield Zoo	23	17	16	16	28
*Indiana Dunes National Lakeshore	18	18	13	17	34
*Grant Park	21	22	16	19	22
Near-North Side					
*Lincoln Park Conservatory	20	31	17	14	17
*Montrose Point (Lincoln Park)	17	37	18	11	18
*Lincoln Park Zoo	20	27	18	16	19
*North Park Village Nature Center	20	48	13	8	11
*Garfield Park Conservatory	14	17	21	22	26
Far-North Sites					
Ryerson woods	36	12	19	12	21
Illinois Beach State Park	29	21	10	16	25
*Chain-O-Lakes State Park	42	20	7	8	23
*Moraine Hills State Park	38	16	8	11	27
Ex-Urban Areas					
*Shawnee National Forest	10	21	14	12	43
Goose Lake Prairie	10	26	12	16	35
Arboretum/Botanic Garden Sites					
*Morton Arboretum	32	18	11	11	28
*Chicago Botanic Garden	32	23	15	12	17
Midewin National Tallgrass Prairie	21	21	19	14	24

*Chi-square test indicated significant differences ($p < .05$)

Although it was not observable in the factor analysis, accessibility appears to be a third characteristic (in addition to proximity and similarity of experiences) that defines visitation patterns. For example, sites in downtown Chicago tended to draw diverse customers that are characteristic of the city population. This pattern may be due, in part, to the accessibility of these sites by Chicago's public transportation system. A previous study of choices among Chicago-area recreation sites found that travel distance to a site was a significant factor in explaining the demand for sites (Darragh et al., 1983; Dwyer et al., 1983; Lin et al., 1988; Peterson et al., 1983).

Interpreting the Factor Patterns

There appear to be a number of interrelated variables that affect participation at each of the 20 sites, and these variables combine to generate complex patterns of participation across the sites, confounding interpretation of the site clusters. First, individual respondents tended to use a fairly small number of the 20 study sites in a 12-month period, with a mean of 5 sites visited (Table 4). One respondent had visited all 20 sites, while 13 percent of respondents had not visited any of the sites.

"Sites visited in the previous 12 months" was used as a variable in the initial factor analysis to focus on those sites where an individual would be exposed to materials/messages/displays over a year--perhaps as part of an integrated information and education program. However, individuals may visit additional sites; but on a less frequent basis. When asked what sites they had "ever visited," the mean number of sites almost doubled (Table 4). This suggests that over a longer period of time, individuals are exposed to a larger number of sites -- perhaps twice as many as reported for the previous 12 months.

When we expand the analysis to "places that people have *heard of*," the average number of sites increases by another 30 percent to a mean of 13 (Table 4). Extending the scope of the investigation to "sites ever visited" or "sites heard of" means there may be more opportunities for developing and linking outreach programs than was originally believed. However, awareness and use of sites varies significantly across the population. The proportion of Hispanic Americans and African Americans that were

"aware of" and "had ever visited" the sites was lower than observed for Non-Hispanic Whites. In addition, those with lower levels of education and income, and females, were less aware of or less likely to have ever visited sites than other sample segments. Older respondents tended to have visited fewer sites in the last 12 months, but reported more visits when they were asked about sites they had "ever visited" or "heard of" -- most likely an expression of life-long experiences.

Overall about 40 percent of respondents reported that they do not go outside Illinois on trips to public outdoor recreation areas. When broken down by racial/ethnic group this included 33 percent of Non-Hispanic Whites, 52 percent of African Americans, and 59 percent of Hispanic Americans. Even those who did make out-of-state trips to public recreation areas were not inclined to take a large number of these trips. Of those who took out-of-state trips to public outdoor recreation areas, Non-Hispanic Whites on average took the most trips while Hispanic Americans took the fewest (Table 5). Older respondents, those that live in south suburban and central Chicago, those with lower levels of education and income, and females, took fewer trips out-of-state to public outdoor recreation areas than other groups. Individuals who stay in Illinois for most or all of their outdoor recreation are likely to be dependent on local resources for outdoor recreation, for experiencing natural resources, and for learning about the management of natural resources.

Implications for Reaching Urban Residents

Our results indicate that a large proportion of Cook County residents (40%) did not travel outside of Illinois to public outdoor recreation areas and those who did took few trips. A larger proportion of county residents had visited or at least heard of some of the 20 sites in Illinois that we asked about in this study. These two findings combined indicate that Cook County residents are highly dependent on local resources for recreation, environmental education, and experiencing a natural environment.

Patterns of individual use across the 20 sites are complex but our results hinted that individuals tend to visit sites that are in close proximity to each other, that provide similar experiences, and that are close to where the respondent lives. Study results suggest that to provide a broad

Table 4. Awareness and Use of Study Sites by Race/Ethnicity

	Mean Number of Sites		
	Anglo American	African American	Hispanic American
Visited in Last 12 Months	5	5	5
*Ever Visited	10	8	7
*Ever Heard Of	14	12	10

*ANOVA test indicated significant differences (P<.05).

Table 5. Percent of Respondents Who Traveled out of State to Visit Public Recreation Areas, by Race/Ethnicity

	Anglo American	African American	Hispanic American
*Traveled out of state (percent)	67	48	41
**Mean trips ¹ (number)	10	5	5

¹ Mean trips by those who took out-of-state trips

spectrum of urban residents with opportunities for outdoor recreation, as well as experiences and information on the management and use of natural resources, is likely to take an effort that focuses on a fairly wide range of urban sites.

For Chicago and Cook County organizations seeking to develop synergistic messages across sites, it may be useful to start with sites within one of the factors identified in this study. For example, the sites that clustered on the downtown Chicago factor may provide a good starting place for such a program, given the strength of this factor and the wide range of environments and emphasis areas (i.e., an aquarium, a museum of natural history, a museum of science and industry, a zoo, and two parks) in which a natural resource message can be delivered. These sites also reach large numbers of diverse urban residents, including racial/ethnic minorities, inner-city residents, and low-income individuals who are particularly dependent on urban experiences for exposure to natural resources. The sites are also relatively well served by public transportation.

Significant questions remain about how to best design and operate an outreach effort across a number of urban sites. Important questions include (1) the effectiveness of the various diverse sites in providing key messages to visitors, (2) how the various messages at each site can be coordinated in an effective matter to achieve synergism, and (3) how to best encourage individuals to visit a larger range of sites. It would seem that an organization with a regional philosophy, logo, and information and education program – such as Chicago Wilderness (Ross 1997) – might be effective here in developing coordinated messages, providing continuity for those messages through a common name or logo, and expanding the network of sites.

Conclusions

A survey of residents of Cook County, Illinois (including Chicago) indicates that they only take a few trips out of state each year to public outdoor recreation areas – trips that would expose them to a wider range of natural resources and resource management. In fact, significant proportions of respondents do not make out-of-state trips at all. Their knowledge of major local and regional sites is somewhat limited as well. Analysis of use over the 20 sites suggests complex patterns that include clusters of sites according to location and similar experiences provided. Particular sites tend to have unique market areas and customer profiles.

Effective strategies for reaching urban residents at urban sites are not simple or straightforward. Efforts to provide

urban residents with information through urban sites should take careful note of the patterns of use across urban sites, and develop outreach strategies accordingly. It is a particularly difficult challenge to develop strategies for synergistic messages across sites; but this may be what is needed to provide a complex understanding of natural resources and their management to urban residents. Additional questions about a strategy for reaching urban residents at urban sites remain: (1) How can programs at different kinds of urban sites influence how urban residents perceive, use, and become involved in the management of other urban and ex-urban sites; and (2) How can urban residents be encouraged to visit additional sites?

The research on which this paper is based was funded, in part, under a Research Joint Venture Agreement between the USDA Forest Service North Central Research Station and the Metropolitan Chicago Information Center.

Literature Cited

- Darragh, A. J., Peterson, G. L., & Dwyer, J. F. (1983). Travel cost models at the urban scale. Journal of Leisure Research, 15(2), 89-94.
- Dwyer, J. F. (1987). Estimating the demand for urban forest recreation sites. In Proceedings of the 18th IUFRO World Congress, Session on Economic Value Analysis of Multiple-Use Forestry. Corvallis, OR: Oregon State University.
- Dwyer, J. F., & Barro, S. C. (2001). Outdoor recreation behaviors and preferences of urban racial/ethnic groups: An example from the Chicago area. In G. Kyle (Comp., Ed.), Proceedings of the 2000 Northeastern Recreation Research Symposium (Gen. Tech. Rep. NE-276, pp. 159-164). Newtown Square, PA: USDA, Forest Service, Northeastern Research Station.
- Dwyer, J. F., Peterson, G. L., & Darragh, A. J. (1983). Estimating the value of urban forests using the travel cost method. Journal of Arboriculture, 9(7), 182-185.
- Lin, Y., Peterson, G. L., & Rogerson, P. A. (1988). A nested urban recreation site choice model. Leisure Sciences, 10(1), 1-15.
- Peterson, G. L., Dwyer, J. F., & Darragh, A. J. (1983). A behavioral urban recreation site choice model. Leisure Sciences, 6(1), 61-81.
- Ross, L. M. (1997). The Chicago Wilderness: A coalition for urban conservation. Restoration & Management Notes, 15(1), 17-24.