FINAL REPORT

Managing Urban Forest Fear/Safety and Vegetation/Privacy

Department of Parks, Recreation and Tourism Management
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MANAGING URBAN FOREST FEAR/SAFETY AND VEGETATION/PRIVACY

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EXECUTIVE SUMMARY

Urban forests provide a range of biological and social benefits. One of the little recognized benefits of urban forests is that they can provide an environment for achieving privacy, away from the fast pace of urban life. This study documents the importance of privacy as a desired outcome from visiting an urban forest. Additional analysis documents that different settings within urban forests are valued for differing privacy outcomes. Lastly, the study sought to understand how desire for privacy is balanced with concerns about comfort and safety in urban forests. Achieving some of the types of privacy requires physical isolation and these situations evoke concerns about safety.

The study was conducted with visitors to a remarkable forest reserve system in Cleveland Ohio. The Cleveland Metroparks is a system of 14 reservations totaling 20,000 acres. Each reservation is managed to provide outdoor experiences for the widest possible range of visitors' interests while still keeping 80 percent of the park district undeveloped. The reservations offer a variety of feature including open fields with picnic areas, ball fields and restrooms; 12-foot wide paved all purpose trails running for many miles through each park; nature centers; and traditional hiking trails running through forests, prairies, meadows and rivers.

The Park District is an ideal setting for environmental preference research. The range of environments allowed the researchers to intercept visitors who were in park environments ranging from open manicured space to backwoods areas with only a minimum of trails. This provided a sample of urban forest visitors who, based on behavior, had different preferences for park environments. Research technicians systematically sampled visitors in open manicured picnic areas, trail heads for the paved all-purpose-trails, and trail heads for backwoods paths.

Participants in the study (n = 571) were sent an attractive questionnaire printed on clay-coated paper. Questions addressed a range of issues including current use of the Cleveland Metroparks Reservations, environmental preferences, desire for different types of privacy from park visits, safety and comfort concerns and basic demographics. One of the environmental preference scales used photographs. The questionnaire was returned by 70 percent of park visitors who agreed to participate in the study, for a sample of 401 questionnaires.

The study results include:

Visitors make distinct preference judgments among different settings within urban forests. Distinctions are made between mature forests, young forests, forests with trails, forests with amenities (benches, picnic tables, decks), settings with water, wide paved paths versus narrow dirt paths, open manicured areas with trees, and open areas without trees.

With the exception of wide-open spaces, all urban forest environments provided some type of opportunity for achieving privacy.

There are several types of privacy desired from an urban forest visit. Getting away from demands of the everyday work/home environment is a major motivation. Intimate communication is another important motivation. This type of privacy refers to opportunities to be alone with others

without interference. Limiting contact with strangers also is important. Other less important motivations include the opportunity to think about the past and future.

Not all visitors visit parks for privacy, but those who do often do not have opportunities for privacy at home and/or at work. Those that seek privacy at urban forests generally achieve it.

Fears and concerns about trips to a forest are salient to urban forest visitors, but concerns vary. Users who prefer wilder urban forest settings tend to be concerned about behavior of people including unfriendly strangers, dogs off leashes, and fast bicyclists. In contrast, users who express preference for more manicured areas and paths near roads tend to be concerned about snakes and spiders, lack of quick emergency help, and to a lesser degree getting lost.

Implications for management

Urban forests provide for privacy experiences in many different types of settings. Providing privacy opportunities for the widest range of people requires offering different types of settings that vary in terms of amenities. Managers should strive to provide backwoods areas with narrow intimate paths. It is possible that intermediate width trails (four feet wide) through wilder areas may be attractive to some visitors who would shun more narrow trails. For those uncomfortable in these areas, trails that run along and in sight of park roads provide increased perceptions of safety while still providing an urban forest experience. Adding some amenities such as benches, bridges and guardrails may increase the acceptability of wilder areas to those who generally prefer manicured areas. Waterscapes are important environments for privacy. Providing access to water areas with comfortable and clean places for couples or small groups of friends to sit is worthwhile. Creating intimate enclosed areas with benches or picnic areas in a larger open area is another effective design strategy. These and other variations in settings provide opportunities for privacy while dealing with perceptions of safety and comfort.

Safety and comfort concerns in forests decreases the use of urban forests for privacy and other uses. Many visitors hold unrealistic expectations of encountering snakes and spiders or getting lost or caught in sudden storms. Both the use of, and support for urban forests will increase with effective outdoor activity socialization and education strategies. Frequent experiences outdoors, particularly during childhood, provides multiple benefits that include developing comfort outdoors and realistic expectations of encountering feared animals and phenomena. With a combination of effective site design, trail layout and placement, and an urban population who is comfortable outdoors, urban forest experiences will be available to everyone.

ACKNOWLEDGMENTS

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Chapter One

Overview

Purpose

Urban parks and forests play a significant role in the lives of urban residents. They provide scenic beauty, support environmentally important ecological processes, and create many and diverse opportunities for human experiences through recreation and leisure. One of the often unrecognized motivations and benefits of urban forests is the opportunity to get away to achieve privacy. When thinking about privacy it is important to remember that privacy can occur while one is alone or with a selected group of friends. While a search for privacy may be one motive for visiting, fears and discomfort associated with forested urban parks may discourage visit by some potential park users.

Conceptual Framework

Urban environments are often characterized as having elements of crowding, environmental stress, and a lack of privacy/individual freedom. Yet, most urban environments also have urban forests and natural areas that can provide for the psychological human needs of freedom of choice, privacy, and recovery from environmental stress, congestion, and crowding. It is commonly assumed that the universal psychological need for opportunities to be-away and to optimize privacy are benefits that urban forests can fulfill for residents of high density and stressful city environments. However, little is known about the being-away opportunities and functional importance of privacy in urban forest settings.

Freedom of choice is considered by Cantril (1966) as a major psychological need of humans, and is stated by Proshansky et al. (1976) as the major unifying theme under which being-away, privacy, and crowding are only associated elements. One of the major reasons for seeking urban forest environments and experiences may be to obtain an element of freedom of choice, in terms of the information people must process, the people they must respond to, and the behavior demanded of them by others.

In an attempt to satisfy any psychological need, people are usually involved in social and physical interactions and exchanges with their environment. Therefore, in order to satisfy the need for freedom of choice, humans commonly seek a degree of control over their environment in an attempt to gain a desired state and degree of freedom of choice. One of the major ways people seek a desired state and degree of control over their environment is through being-away opportunities and privacy. Outdoor recreation experiences in close-to-home urban forests may serve these being-away opportunities and privacy needs for many urban residents.

Years of motivational research in outdoor recreation suggest that the most universal reason humans seek recreational settings is for temporary escape (Driver 1972; Driver and Knopf 1976; Knopf 1983). Fly (1986) and Kaplan and Kaplan (1989) have more recently argued that the restorative component of being away is a more comprehensive reason than escape for people seeking outdoor recreation settings. Related to the restorative benefits of being away in outdoor recreation settings, Hammitt and Brown (1984), Iso Ahola (1980), Ulrich et

al. (1991) and others have stressed the functional values of privacy in outdoor settings as a means to cope with urban interactions and environmental stress.

According to Altman (1975), privacy is an interpersonal boundary control process that regulates social interaction with others to provide a person with a desired level of privacy. Thus, privacy is an optimizing process that aims at an optimal amount of contacts with others; too much or too little interaction is unsatisfactory. To achieve the optimum, a person has to restrict and at other times, seek contacts with others. Privacy is, therefore, a dialectic process, a continuous interplay of opposing forces, to shut one self off from others at one time and to open oneself up to interpersonal contacts at another time. The desired level of social interaction is not stable but rather dynamic, changing with circumstances, situational settings, and time.

In the context of urban forest environments, there is probably a second dialectic process to be considered. This process involves the positive and negative aspects of vegetation in urban forest settings on the recreationist's desire for privacy. While forest vegetation provides for the being away aspects of privacy, it also has an element of unpredictability and safety that accompanies it in urban settings (Bixler & Floyd, 1997). Dense and/or isolated urban forest vegetation may be as stressful for some urban recreationists as dense city environments. For some urban recreationists in some urban forest settings, the uncertainty and safety aspects may outweigh the privacy aspects. Fears may include getting lost, wild animals, being caught in sudden storms, strangers, loose dogs, snakes, spiders, and the unfamiliarity of woodland environments. Comfort concerns include a range of disgust elicitors such as dirt, insects, rotting substances, horse manure, and a range of odors. The lack of modern conveniences such as restrooms and running water contribute to lowered interest in forest activities. Extreme heat and cold also reduce interest in forest recreation for a population use to homes with central climate control. For individuals lacking knowledge about forest environments, forest recreation may be viewed as not being psychologically stimulating.

An urban forest can be associated with positive outcomes such as achieving privacy or negative outcomes such as fearful reactions and discomfort. Forest vegetation can be associated with both these positive/negative outcomes. Yet, efficient management efforts to provide for the fundamental restorative opportunities of being away and restorative functions of privacy in urban forest settings cannot proceed without an understanding of these two outdoor recreation phenomena.

This study explores the use of parks for privacy, preferred urban park environments, and fears and discomforts associated with urban parks and micro-environments commonly found within urban parks. The specific objectives of the study are:

 1) To describe the visitors of urban forest settings, their desire for privacy, and their use patterns of various forest settings for privacy opportunities.

 2) To determine the privacy preferences of urban forest visitors through visitor ratings of photos (photo-questionnaire) of a spectrum of micro-site settings within urban forests.

3) To determine the amount of privacy achieved during visits to urban forests and the functions (benefits) that privacy serves in urban forest environments.

4) To understand the fear and safety perceptions of visitors in various site and vegetation density settings in urban forests, and the interactions of these fears with privacy seeking opportunities

5) Based on the findings of the previously stated objectives, to suggest means to manage urban forest settings for privacy opportunities in relatively safe and non-fearful environments.

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<center>**Chapter II**</center>

<center>**Methods**</center>

Study Area

The study area was Cleveland Metroparks in Cleveland Ohio. The park district consists of 14 forest reserves located within two urban counties in northeastern Ohio. The Park District was established in 1917 to provide open space for the people of Greater Cleveland, as well as to conserve and preserve the natural valleys of the area. In 1999, Cleveland Metroparks consisted of approximately 20,000 acres in 14 reservations. Over 100 mile of parkways, six nature centers and the Cleveland Metroparks Zoo compose the park district. The park district is 80% undeveloped offering many opportunities for woodland and natural area experiences. Other facilities and opportunities include picnicking, golf, fishing, winter recreation, wildlife areas and outdoor education and recreation programs.

Yearly attendance for the parks is in excess of 50 million visits by car and foot. At least 15 million of these visits are recreational visits, the rest are commuting or scenic driving. The park district enjoys widespread citizen approval, with independent surveys by government watchdog agencies indicating almost complete satisfaction among area residents.

Six reservations in the park district were used for the study. The reservations are: Garfield Park, Rocky River, Brecksville Bedford, Mill Stream Run Reservation and Huntington Reservations.

Garfield Park Reservation features picnic areas, a marsh, trails and a nature center. The southwestern area of the reservation is set aside as the Iron Springs Wildlife Preserve and is managed for upland wildlife species. The reservation is located within Cleveland and is considered urban **in** character. It is a smaller 177 acre reservation but strikingly wild in character in some areas. Garfield Park Reservation received 2,397,000 visits in 1999.

Rocky River Reservation is a linear park located in western Cuyahoga County. The Rocky River runs through the park, providing a valley/riverbottom character. Massive shale cliffs rise above the riparian vegetation. Several trails, both natural and paved, wind through the valley. Deer and other wildlife are common attractions to both on-foot visitors and those participating in scenic driving. Rocky River Reservation received 5,317,000 visits in 1999.

Brecksville Reservation is located in the southeastern part of Cuyahoga County. Winding roads, paved all purpose trails, and woodland trails wind throughout the park. A nature center, restored prairie and traditional picnic areas provide additional experiences. Brecksville Reservation received 5,031,000 visits in 1999.

Bedford Reservation is located in the southeastern part of Cuyahoga County. One of the more rustic parks, it offers many walking trails, paved all purpose trails, and several historic attractions. Brecksville Reservation received 5,031,000 visits in 1999.

Huntington Reservation is located on the shores of Lake Erie. This more developed park offers limited trails, but scenic views of the lake. Several not-for-profit agencies offer year-round programs at Huntington. The reservation's Lake Erie beach is immensely popular during the summer months. Visitation for 1999 was 893,900.

Figure 1. Cleveland Metropark System.
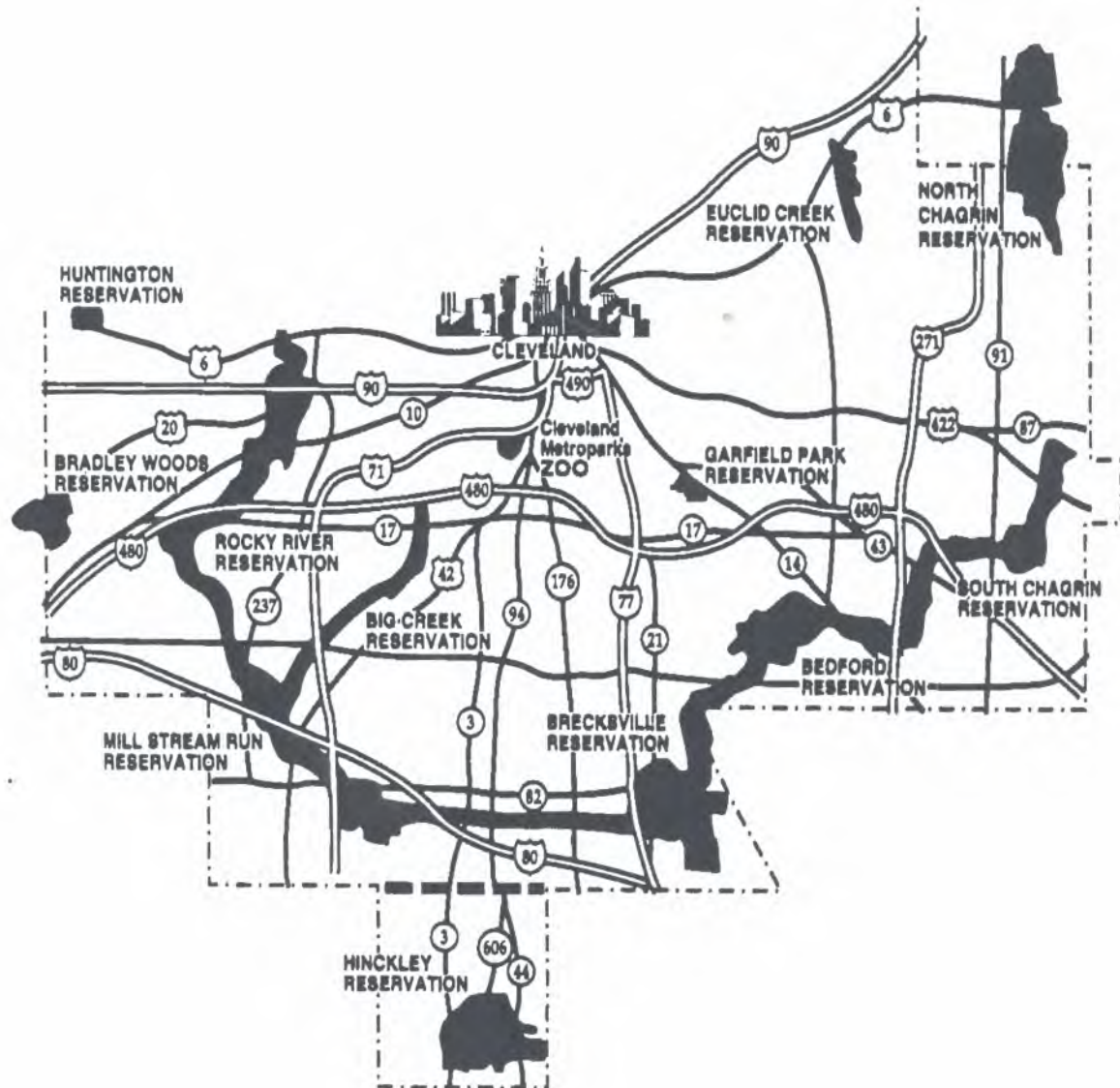
Sampling Procedure

In June and July of 2000, two research technicians intercepted 633 visitors to the Cleveland Metroparks reservations, asking them to participate in a study. Of those approached, 591 agreed to participate. These individuals provided their name and address so that a mail-back questionnaire could be sent to them. Twenty of the addresses were returned as undeliverable for several reasons.

The explicit assumption behind the sampling framework is that by sampling different parks ranging from suburban to urban, and different physical environments within parks the sample would contain a wide variety of park users in terms of their environmental preferences.

On-site sampling occurred for two, two-week periods, one in June and the other in July. Sampling was distributed over weekday and weekends, reservations and within three park environments in each reservation. The sampling framework was a stratified, non-proportional, convenience sample. The design provided for a sample of park visitors who were visiting different park micro-environments or zones.

Sampling was stratified by park, time of day and by three physical environments within each park. The time intervals were morning (8-11a.m.), lunch (11a.m. to 2 p.m.) and afternoon/evening (3 to 6 p.m.). Technicians sampled equal number of visitors in three types of park environments. The first environment-type was undeveloped back-woods areas. These environments shared the characteristics of dirt paths through woods and fields. The second environment-type was All-Purpose Trails. These environments shared the characteristics of paved 8 to 12 foot wide paved paths, typically along but separate from park roadways. The paths often had woodlands on one side, and an open park road on the other. Rarely did the paths flow deep into any wooded area. In some places, an All-Purpose Trail may border manicured green space for some distance. The third environment-type was developed picnic areas. These environments are characterized by multiple picnic tables often under large shelters, restrooms, large parking lots and a large mowed field. A few of these areas offer a softball diamond with backstop.

Mail Questionnaire

Within one week after the park visitors agreed to participate in the study, they received in the mail a questionnaire, cover letter and postage-paid return envelope. A modified Dillman maximum response method (2000) was used to increase response rate. A postcard reminder was sent two weeks after the initial mailing, if the questionnaire had not been returned. If there was still no response after an additional two weeks, a replacement questionnaire, cover letter and postage-paid return envelope was mailed out. This packet advised the study participant that another questionnaire was enclosed in case the first one had been lost or misplaced. A final reminder postcard was sent two weeks later. Using this method, 401 questionnaires were returned out of 571 deliverable questionnaires for a response rate of 70%. All park users that agreed to participate in the study received a one in five chance of winning either two tickets to the Cleveland Metroparks Zoo or one ticket to play golf at a Cleveland Metroparks golf course. The latter is a potential measure of environmental preference.

The Survey Instrument

The sixteen page mail-back questionnaire measured 8.5 X 11 inches and was printed on glossy clay-covered paper to increase the sharpness of the reproduction of photographs.

Intercept Card

The intercept card was designed to create a temporary record of each participant's name and address. Additional information was recorded about group size, gender and ethnic group, and the presence of children and dogs. These characteristics were coded based on the perceptual judgment of the research technician. The research technician noted on the intercept card whether participants would like to receive a golf pass or zoo tickets if they won the drawing.

The sixteen page mail-back questionnaire consisted of several sections including trip characteristics, environmental preferences, environmental preferences for privacy, privacy achievement scale, functions of park privacy, comfort and safety in park areas, and demographics. The scales are described below and may be found in the Appendix.

Trip Characteristics: This section provided measures of the social group within which the visit occurred, whether children were present, major activities, park environments visited, length of stay, and mode of travel to the park.

Environmental Preferences: This section provided measures of environmental preferences. Thirty-eight photographs were rated on a seven-point bi-polar scale. The instructions asked respondents to imagine themselves in each area and then rate how much they would like or dislike being in each park area. The photographs varied from manicured green space with paved paths, to wild areas with no paths.

Environmental Preferences for Privacy: This section provided measures of the degree to which different park environments are perceived as providing for park privacy. Items ranged from "picnic areas in open fields" to "forested areas with no obvious trails." Respondents answered on a ten point scale where 1=do not prefer this setting for privacy and 10=prefer this setting for privacy.

Privacy Achievement Scale: This section provided information about current levels of privacy achieved by respondents. Four questions were asked on a 10-point scale. The first item asked how much privacy the respondent achieved at home. Respondents answered on a ten point scale where 1=low level of privacy and 10=high level of privacy. The second item used the same response scale and asked what level of privacy was achieved at work. The third question asked how important the desire for privacy was in choosing to visit the park. Respondents answered on a ten point scale where 1=privacy not important and 10=privacy very important. The fourth question asked whether the respondent achieved a desired level of privacy during the visit. Respondents answered on a ten point scale where l=did not achieve my desired level of privacy and 10=fully achieved my desired level of privacy.

Functions of Park Privacy Scale: This section provided information about specific functions served by parks in terms of privacy. Twenty-seven questions taped a wide variety of functions that urban forests could serve for people. A seven-point bipolar importance scale was used by the respondents to indicate the importance of each function.

Park Comfort Scale: This section provided self-report measures of fears and discomforts associated with forests. Respondents were asked to report their concerns in taking a full day trip into a national forest. A six-point uni-polar scale was used to measure concerns where 0—not concerned and 5—extremely concerned.

Data Analysis

Data analysis was conducted with the Statistical Package for the Social Sciences (SPSS) version 10. Means or frequencies were reported where appropriate. Internal validity and reliability of scales were assessed using factor analysis and Cronbach's alpha. Factor analysis consisted of principal components analysis and varimax rotation. Items with factor loadings > 0.40 were retained. The number of factors was determined based on eigenvalues > 1.0. Factors with Cronbach alpha's > 0.60 were retained. After the factor analysis, all scales were subject to segmentation analysis to identify discrete groups of forest visitors if they exist. A K-means cluster analysis was used for the segmentation analysis. Additional data analysis procedures are discussed elsewhere in the report.

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Chapter III

Descriptive Results

Introduction

Before presenting inferential data about the interactions of environmental preferences, privacy and fears/discomforts associated with urban proximate forests, this chapter reviews the results from each of the scales. These simple results, consisting of descriptive statistics, factor analysis and group segments, are rich in information about how visitors perceive urban forests, how forests function as places to achieve privacy, and safety and comfort concerns held by urban forest users.

Visitor Profile

A necessary step in understanding the results of this study is keeping in mind the method and purpose behind the sampling strategy. The sampling method used in this study was designed to capture variation in environmental preferences. Consequently, the sample does not necessarily reflect the demographic profile of park users. The significant outcomes of this study are not population parameter estimates, rather types of preferences and how environmental preferences, desires for privacy and fears and discomforts are interrelated. In simple terms, the percentages reported in this paper do not describe actual percentages of urban forest visitors' preferences and behaviors at the Cleveland Metroparks system.

The demographic makeup of the study sample is summarized in Table 1. Mean years of age was 48. Forty-four percent of study participants were male. (Many studies of urban parks indicate a lower percentage of females using parks.) Almost two-thirds of the sample had completed at least an undergraduate degree. Eighty-eight percent of the sample was white and 8.6 percent was African American. Household income varied with almost 60 percent having income below $60,000 and 15 percent having an income above $100,000. Type of residence was dominated by respondents who lived in a house. Eighty-three percent reported living in a house while the remainder reported living in a townhouse, condominium or apartment. Place of residence was either suburban or urban. Sixty-eight percent reported living in a suburban area, while 27.6 percent reported living in urban areas.

Table 1. Demographic characteristics of the study population.

Visitor Demographics	Frequency	Percentage
Age		
(Mean 46.88 years of age)		
Gender		
Male	173	44.4
Female	217	55.6
Education		
Elementary	2	.5
High School	108	28.0
College	207	53.4
Graduate Study	70	18.1
Ethnic Background		
Hispanic American	5	1.2
Black or African American	34	8.6
White or European American	353	88.1
Asian American	1	.2
American Indian or Native American	3	.7
Other	5	1.2
Household Income		
Less than $20,000	30	8.3
$20,000-$39,999	101	27.8
$40,000-$59,999	82	22.7
$60,000-$79,999	65	18.0
$80,000-$99,999	30	8.3
$100,000 or more	54	14.9
Residence Type		
House	328	82.2
Townhouse	5	1.3
Condominium	18	4.5
Apartment	39	9.7
Other	9	2.3
Home Location		
City	110	27.6
Suburb	260	65.3
Small town	17	4.3
Country	8	2.0
Farm	3	.8

Visit Information

Visits to urban forests have one social characteristic that differentiates them from visits to more remote areas: There are many more visits made by people who are alone. In this sample about one in four visitors to the parks were by themselves. About forty-percent of the sample reported having a child under the age of thirteen with them. Not surprising for Cleveland Ohio, over ninety percent of respondents reported traveling to the reservations by car. Perceived length of stay was long with a mean of 164 minutes and a range of 15 to 640 minutes. These values are self-report and may be high. Previous studies of vehicle turnover at the park district indicate an average stay of one hour. The longer stays seem to be associated with large group picnics, some of which lasted all day. Characteristics of the respondents' visits to the reservations are summarized in Table 2.

Table 2. Trip characteristics of respondents.

Trip Characteristics	Frequency	Percentage
Group Composition		
Visit alone	106	26.7
Visit with a group of people	291	73.3
With friends	63	21.5
With family	148	50.3
With family and friends	38	12.9
With an organized club	13	4.4
Other	32	10.9
Children Present?		
Children present	127	42.5
Children not present	172	57.5
Mode of Transportation to Park		
By car	372	93.2
By bicycle	7	1.8
Walked	16	4.0
Jogged	4	1.0
Time Spent at Park During This Visit		
Mean	164.02	
Minimum	15.00	
Maximum	640.00	

Use of Park Environments During the Visit

Respondents were asked to indicate which environments (places) within the reservation they used during the visit. Respondents were asked to check all environments that applied to them. Results are summarized in Table 3. The most frequently used environment was the paved All-Purpose-Trail with over 60 percent reporting use of these trails. Picnic areas were the second most frequently used areas with almost 50% reporting their use. Unpaved trails through woods and meadows were used by 40 percent. Almost 29 percent reported using unpaved trails along rivers or lakes. Further analysis indicates that 85 people or 31 percent of the individuals who reported walking on unpaved trails through woods or meadows or along rivers and lakes, reported using both environments. Use of a picnic area was either uncorrelated or negatively correlated with using all areas except open fields ($r=.30$, $p<.001$). Use of off-trail areas was positively correlated with use of unpaved trails along rivers and lakes, unpaved trails through woods and meadows and use of a nature center ($r= .19$ to $.39$, $p<.01$). While some of the relationships can be explained based on functional/motivational aspects of a specific visit, the correlations among these reported behaviors, may indicate distinct environmental preferences.

Table 3. Use of forest facilities and areas during current visit.

Facilities	Frequency	Percentage
Paved all purpose trails	245	61.1
Picnic area	192	47.9
Unpaved trails through woods and meadows	161	40.1
Unpaved trails along rivers or lakes	115	28.7
Mowed fields	63	15.7
Nature center	57	14.2
Other	53	13.2
Off-trail hiking	50	12.5

Respondents were asked to check all facilities they used during the visit they were contacted. Percentages do not add up to zero because of respondents indicated they used more than one type of facility or area.

Photographic Environmental Preference Scale

This scale was developed using photographs taken primarily, but not solely at the reservations comprising Cleveland Metroparks. Hundreds of black and white photos were taken during the early summer. Q sorts by the researchers, research technicians and students within the Department of Parks, Recreation and Tourism Management were used to identify similar groups of photographs and then to select a smaller group of photographs that best illustrated the diversity of physical settings found in the urban forests of Cleveland Metroparks.

A final selection of 38 photographs was used in the questionnaire. The photographs were reproduced on high quality clay-covered paper. Respondents rated their preference for being in each environment on a seven-point bipolar dislike-like scale. Factor analysis (principal components with vari-max rotation) was used to identify groups of similar photographs based on respondents' ratings. Cronbach's alpha was used to evaluate internal reliability of each factor.

In Table 4, means and standard deviations are presented for the 38 photographs. The number after the photo indicates the order in which the photographs were presented in the questionnaire. Few patterns are obvious from the rankings. Two of the highest ranked photographs contain water. High preference for waterscapes is consistent with the existing empirical environmental preference literature. Many of the lowest ranked photographs contain grassy fields. Other high ranked views contain trails through woods. None of the environments had a mean ratings below the neutral point on the scale. A different perspective on environmental preference comes from looking at the factor structure of the scales and finally segmentation of respondents based on their ratings of the photos.

Table 4. Ranking of Photographic Environmental Preference Scale items.

| | Preference for Setting | |
Park Setting	Mean	Standard Deviation
Photo 1: Trail with steps & bridge through woods	6.57	1.03
Photo 15: Beach with woods	6.49	.81
Photo 38: Deck overlooking waterfall	6.29	.88
Photo 6: Trail with shrubby undergrowth on both sides	6.23	1.08
Photo 17: Boardwalk through woods	6.18	1.01
Photo 30: Picnic table overlooking water and deck	6.15	1.02
Photo 23: Trail through woods with split rail fence	6.14	1.08
Photo 7: Picnic table in open wooded area	6.11	1.00
Photo 37: Picnic shelter and picnic tables	6.04	1.11
Photo 36: Trail through semi-dense woods	5.96	1.27
Photo 21: Picnic table in grassy area with trees	5.93	1.11
Photo 9: Trail with woodland wildflowers on both sides	5.92	1.32
Photo 20: Trail with bridge through woods	5.83	1.44
Photo 28: Trail through dense woods	5.70	1.46
Photo 16: Picnic table surrounded by dense woods	5.69	1.26
Photo 31: Trail through open woods	5.68	1.40
Photo 2: Paved all purpose trail, woods on one side	5.64	1.47
Photo 8: Trail along pond	5.62	1.46
Photo 4: Open woods	5.55	1.49
Photo 24: Paved all-purpose trail next to road	5.55	1.37
Photo 32: Paved all purpose trail woods on one side	5.50	1.32
Photo 18: Paved all purpose trail through dense woods	5.45	1.36
Photo 10: Paved all purpose trail through woods	5.44	1.40

Table 4 (cont). Ranking of Photographic Environmental Preference Scale items.

| | Preference for Setting | |
Park Setting	Mean	Standard Deviation
Photo 14: Trail through woods on a slope	5.40	1.72
Photo 22: Deck overlooking water	5.38	1.59
Photo 27: Grassy area in woods	5.10	1.53
Photo 35: Grassy area bordering woods	4.90	1.44
Photo 29: Picnic table next to vine covered trees	4.85	1.56
Photo 26: Trail through opening in dense woods	4.82	1.75
Photo 12: Grassy field with young trees	4.78	1.75
Photo 33: Wide swath of grass through woods	4.71	1.49
Photo 34: Open woodland understory	4.62	1.80
Photo 19: Grassy field bordered by woods	4.39	1.73
Photo 13: Field beginning to turn into woods	4.35	1.87
Photo 11: Grassy field	4.30	1.91
Photo 3: Mowed field	4.15	1.82
Photo 5: Field surround by shrubby undergrowth	4.13	1.98
Photo 25: Trail through grassy field	3.99	1.89

Based on a seven-point bipolar scale from –3 to 3, recoded 1 to 7.

Factor analysis based on principal components and a vari-max rotation produced seven interpretable factors that are presented in Table 5. To further help in interpreting the factors, Figure One contains the individual photos making up each factor. The factor analysis explained 66 percent of the variance. Cronbach alpha's for each factor were in the acceptable range except for the last factor, which consists of wide-open areas. This factor's Cronbach alpha was .48. Reliabilities tend to be lower on factors with only two or three items. This factor is theoretically important because it represents wide-open areas with a smooth ground surface. The presence of water in one of the photographs probably confounds ratings, lowering the reliability.

The first factor consists primarily of environments characterized by young open woods with undergrowth. The undergrowth in most photos is tall grass or low shrubbery. These photos tended to have lower, but not negative preference ratings (mean=4.71). One photo with a picnic table appears in this grouping. Some of the photos contain trails, others do not.

The second factor consists primarily of older woodland areas, often with a woody understory. These photos depict typical woodland scenes commonly found in northeastern Ohio. All the photos had trails running through them. These photographs tended to have higher mean preference ratings (mean=6.00).

The third factor consists entirely of wide paved paths running through wooded and manicured environments. The paved paths are 8 to 12 feet wide and have grassy berms on

both sides. Most respondents would recognize these paths as "All-Purpose-Trails" as designated by Cleveland Metroparks. They are used by foot, bicycle, and in-line skate enthusiasts. These scenes tend to have moderate preference ratings relative to the other factors (mean=5.51).

The fourth factor consists of environments with water. Three of the four photographs contain some sort of structure such as a deck or picnic table in the view. Waterscapes tend to be identified as highly preferred in most environmental preference studies. This study was no exception with the photographs receiving high preference ratings (mean=6.08).

The fifth factor consists of two environments characterized by a wooden structure in a relatively enclosed woodland environment. Because there are only two photographs in this factor, it is difficult to specify with any certainty the characteristics that the two photographs share. Both have wooden structures and a sense of enclosure or environmental intimacy. These scenes tend to have moderate to high preference ratings relative to the other factors (mean=5.94).

Factor six contains environments characterized by structures such as picnic tables, picnic shelters and a sizeable portion of the area in open mowed or smooth ground. These scenes tend to have high preference ratings relative to the other factors (mean=6.03).

Factor seven is composed of environments with open smooth ground surfaces with woods in the distance and no visible structures that would support recreation behavior. This factor has a low reliability value (alpha=.48) and must be interpreted with caution. These scenes had the lowest average mean preference ratings (mean=4.88).

These results help define what types of environments urban forest visitors make distinctions among. Traditional wooded forest areas, picnic areas and all-purpose-trail areas are highly preferred, while areas lacking trails, with younger woodland vegetation and areas consisting of primarily smooth ground surfaces with no recreational structures are less preferred. But these areas may play other useful roles in an urban forest. See Figure 1 for a photographic version of Table 5.

Table 5. Factor structure of Photographic Environmental Preference Scale.

Factors	Mean	Loading	Alpha	Explained Variance
Young trees, grassy and bushy understory			0.95	23.4
Photo 11: Grassy field	4.30	.86		
Photo 13: Field beginning to turn into woods	4.35	.85		
Photo 12: Grassy field with young trees	4.78	.84		
Photo 27: Grassy area in woods	5.10	.80		
Photo 19: Grassy field bordered by woods	4.39	.79		
Photo 26: Trail through opening in woods with understory	4.82	.78		
Photo 25: Trail through grassy field	3.99	.77		
Photo 34: Open woodland understory	4.62	.76		

Table 5 (cont). Factor structure of Photographic Environmental Preference Scale.

Factors	Mean	Loading	Alpha	Explained Variance
Photo 5: Field surround by shrubby undergrowth	4.13	.74		
Photo 35: Grassy area bordering woods	4.90	.66		
Photo 14: Trail through woods along a slope	5.40	.61		
Photo 33: Wide swath of grass through woods	4.71	.56		
Photo 29: Picnic table next to vine covered trees	4.85	.55		
Photo 4: Open woods	5.55	.48		
Older trees, tall woody understory, woodland paths			0.77	12.0
Photo 6: Trail with shrubby undergrowth on both sides	6.23	.74		
Photo 23: Trail through woods with split rail fence	6.14	.69		
Photo 9: Trail with woodland wildflowers on both sides	5.92	.69		
Photo 20: Trail with bridge through woods	5.83	.66		
Photo 1: Trail with steps & bridge through woods	6.57	.65		
Photo 28: Trail through dense woods	5.70	.56		
Photo 36: Trail through semi-dense woods	5.96	.54		
Photo 31: Trail through open woods	5.68	.48		
Environments with wide paved paths			0.85	9.7
Photo 18: Paved all purpose trail through dense woods	5.45	.83		
Photo 10: Paved all purpose trail through woods	5.44	.81		
Photo 2: Paved all purpose trail, woods on one side	5.64	.80		
Photo 24: Paved all-purpose trail next to road	5.55	.71		
Photo 32: Paved all purpose trail woods on one side	5.50	.70		
Environments with water			0.62	6.6
Photo 38: Deck overlooking waterfall	6.29	.74		
Photo 15: Beach with woods	6.49	.62		
Photo 22: Deck overlooking water	5.38	.62		
Photo 30: Picnic table overlooking water and deck	6.15	.56		
Forested area, moderate sized trees with structures			0.65	5.5
Photo 16: Picnic table surrounded by young dense woods	5.69	.70		
Photo 17: Boardwalk through woods	6.18	.56		
Picnic area, moderately open with a few large trees/shade			0.75	4.6
Photo 7: Picnic table in open wooded area	6.11	.70		
Photo 21: Picnic table in grassy area with trees	5.93	.65		
Photo 37: Picnic shelter and picnic tables	6.04	.53		
Large smooth surfaces			0.48	4.1
Photo 8: Hardscape next to pond	5.62	.60		
Photo 3: Mowed field	4.15	.59		

Based on a bi-polar scale 7 point scale from −3 to 3, recoded 1 to 7. Total explained variance=66 percent.

Figure 2. Factors based on Photographic Environmental Preference Scale

Factor: Young trees, grassy and bushy understory, no trails

Factor: Older trees, tall woody understory, woodland paths

Factor: Environments with wide paved paths

Factor: Environments with water

Factor: Forested areas, moderate sized trees, with structures

Factor: Picnic areas, open with a few large trees, shade

Table 6. Cluster analysis of environmental preferences.

	Item Mean	Cluster one n=42	Cluster two n=44	Cluster three n=64	Cluster four n=92	Cluster five n=156
Photo 1: Trail with steps & bridge through woods	6.57	5.41	6.35	6.73	6.14	6.68
Photo 2: Paved all purpose trail, woods on one side	5.64	5.95	5.81	5.25	5.68	5.64
Photo 3: Mowed field	4.15	3.95	2.74	2.44	4.41	5.15
Photo 4: Open woods	5.55	3.67	4.86	6.13	4.86	6.43
Photo 5: Field surround by shrubby undergrowth	4.13	1.76	2.00	4.02	3.68	5.68
Photo 6: Trail with shrubby undergrowth on both sides	6.23	4.38	6.45	6.72	5.73	6.72
Photo 7: Picnic table in open wooded area	6.11	5.71	6.02	6.27	5.75	6.39
Photo 8: Trail along pond	5.62	4.60	5.36	5.19	5.58	6.17
Photo 9: Trail with woodland wildflowers on both sides	5.92	3.74	5.56	6.44	5.59	6.60
Photo 10: Paved all purpose trail through woods	5.44	-.-	-.-	-.-	-.-	-.-
Photo 11: Grassy field	4.30	2.05	1.98	3.53	4.08	5.99
Photo 12: Grassy field with young trees	4.78	2.71	2.88	4.32	4.57	6.19
Photo 13: Field beginning to turn into woods	4.35	1.81	2.48	3.92	4.03	5.93
Photo 14: Trail through woods on a slope	5.40	2.76	3.77	6.34	5.02	6.42
Photo 15: Beach with woods	6.49	6.12	6.41	6.49	6.22	6.76
Photo 16: Picnic table surrounded by dense woods	5.69	4.46	5.32	5.97	5.17	6.32
Photo 17: Boardwalk through woods	6.18	5.49	5.73	6.67	5.86	6.49
Photo 18: Paved all purpose trail through dense woods	5.45	-.-	-.-	-.-	-.-	-.-
Photo 19: Grassy field bordered by woods	4.39	2.21	2.64	3.46	4.52	5.80
Photo 20: Trail with bridge through woods	5.83	3.07	5.55	6.47	5.43	6.62
Photo 21: Picnic table in grassy area with trees	5.93	-.-	-.-	-.-	-.-	-.-
Photo 22: Deck overlooking water	5.38	-.-	-.-	-.-	-.-	-.-
Photo 23: Trail through woods with split rail fence	6.14	4.74	6.02	6.65	5.73	6.60
Photo 24: Paved all-purpose trail next to road	5.55	-.-	-.-	-.-	-.-	-.-
Photo 25: Trail through grassy field	3.99	2.07	1.84	3.23	3.78	5.54
Photo 26: Trail through opening in dense woods	4.82	1.90	3.30	4.98	4.42	6.19
Photo 27: Grassy area in woods	5.10	2.90	3.45	5.10	4.84	6.31
Photo 28: Trail through dense woods	5.70	3.12	5.40	6.21	5.18	6.59
Photo 29: Picnic table next to vine covered trees	4.85	3.10	3.79	4.63	4.37	5.98
Photo 30: Picnic table overlooking water and deck	6.15	5.57	6.16	6.16	5.82	6.50
Photo 31: Trail through open woods	5.68	3.60	5.05	6.17	5.12	6.55
Photo 32: Paved all purpose trail woods on one side	5.50	-.-	-.-	-.-	-.-	-.-
Photo 33: Wide swath of grass through woods	4.71	3.62	3.28	4.16	4.63	5.68
Photo 34: Open woodland understory	4.62	2.34	2.41	4.61	4.45	5.95
Photo 35: Grassy area bordering woods	4.90	3.54	3.27	4.67	4.66	5.94
Photo 36: Trail through semi-dense woods	5.96	3.67	5.43	6.44	5.69	6.69
Photo 37: Picnic shelter and picnic tables	6.04	-.-	-.-	-.-	-.-	-.-
Photo 38: Deck overlooking waterfall	6.29	6.19	6.18	6.33	6.02	6.49

"-.-" indicates no differences across all clusters.

Results from the cluster analysis identify three distinct groups of people. The largest group consists of individuals who have a wide preference for urban forest environments. A second cluster has a distinct and negative preference for wilder environments, reporting a preference for only manicured recreation settings. A third cluster reports a wide preference for environments, but only if there are fairly wide trails through the environment.

Privacy Setting Scale

The photographic environmental preference scale provided a general measure of preferences for being in differing urban forest environments. A second written scale asked respondents to report their preferences for using different urban environments as places to achieve privacy. This scale was positioned in the questionnaire following the photographic environmental preference scale.

Descriptive statistics for the scale are reported in Table 7. Forested trails along running water was the highest ranked environment and also had the lowest standard deviation. The low standard deviation suggests consensus among respondents that this type of environment is highly preferred to achieve privacy. Two additional environments with water present where among the top four ranked settings for privacy. Middle ground in the rankings consisted of all-purpose-trails and woodland areas. Bottom-ranked environments included forested areas with no trails, all-purpose-trails along roads and open fields.

Table 7. Preferences for different park settings for obtaining privacy.

Park Setting and the Importance of Privacy	Preference for Setting	
	Mean	Standard Deviation
Forested trails along running water	8.39	1.93
Nature trails with signs	7.46	2.30
Open trails near ponds	7.26	2.22
Waterfront areas with beach	6.80	2.81
Unpaved trails where only hiking is allowed	6.69	2.89
Picnic areas with tables in the forest	6.53	2.48
Trails densely forested on both sides	6.45	2.94
Trails with park open space on one side	6.15	2.26
All purpose paved trails used by foot and bike traffic	5.98	2.74
Picnic areas with shelters in open fields	5.57	2.78
Forested areas with no obvious trails	5.17	3.16
All purpose trails along roads	5.17	2.79
Open park fields	4.58	2.55

Based on a uni-polar scale from 1 to 10 where 1=do not prefer this setting for privacy and 10=prefer this setting for privacy.

Factor analysis was used to identify environments that respondents perceived to be similar as settings to obtain privacy. Table 8 presents the results of a principal components factor analysis with vari-max rotation of the Settings for Park Privacy scale. The factor analysis explained 60 percent of the variance among the items. Cronbach's alphas were all above .70 indicating good internal reliability.

Three factors were identified in the analysis. The first factor was Forested Environments, characterized as being wild in character. The grand mean for this factor is 6.21. The second factor is Forested with Amenities Environments. These environments are forested but offer amenities. The grand mean for this factor is 7.05. The third factor is Developed Park Environments. These environments have fewer trees, more open space, more amenities and probably more people present. The grand mean for this factor is 5.53. The results from the factor analysis indicate that forested areas with some amenities and paths are most preferred as privacy settings. Open areas, or areas that attract lots of people are less preferred, but even these setting had grand means in the middle of the scale. They may provide other benefits besides privacy.

Table 8. Preferences for different park settings for obtaining privacy.

Factors	Mean	Loading	Alpha	Explained Variance
Forested environments			0.78	21.7
Forested areas with no obvious trails	5.17	.84		
Unpaved trails where only hiking is allowed	6.69	.82		
Trails densely forested on both sides	6.45	.81		
Picnic areas with tables in the forest	6.53	.56		
Forested with amenities environments			0.72	20.9
Nature trails with signs	7.46	.79		
Open trails near ponds	7.26	.72		
All purpose paved trails used by foot and bike traffic	5.98	.58		
Forested trails along running water	8.39	.57		
Trails with park open space on one side	6.15	.47		
Developed park environments			0.73	17.1
Picnic areas with shelters in open fields	5.57	.81		
Open park fields	4.58	.80		
All purpose trails along roads	5.17	.54		
Waterfront areas with beach	6.80	.48		

Based on a uni-polar scale from 1 to 10 where 1=do not prefer this setting for privacy and 10=prefer this setting for privacy.

A segmentation analysis was conducted with the Settings for Park Privacy scale to identify segments of urban forest users. A K-means cluster analysis identified three segments of users. The clusters are presented in Table 9.

Cluster One is composed of n=125 respondents. This segment has a low preference for wild areas lacking trails or densely wooded, but they also do not prefer open fields. They can best

be characterized as preferring forest environments with vegetation but with significant built features such as picnic tables and shelters, trail signage, and trails.

Cluster Two is composed of n=133 respondents. They have a higher preference for most environments relative to the other two clusters. The only environment with a low preference rating is "Forested areas with no obvious trails."

Cluster Three is composed of n=139 respondents. This group prefers the wilder settings including forested areas with no trails. Areas with built features such as all purpose trails, picnic areas received lower preference ratings.

Table 9. Cluster analysis of the Settings for Park Privacy scale.

Park Setting and the Importance of Privacy	Mean	Cluster One	Cluster Two	Cluster Three
Trails densely forested on both sides	6.45	3.99	6.48	8.59
Trails with park open space on one side	6.15	5.28	7.40	5.75
Open park fields	4.58	3.99	6.19	3.54
Forested trails along running water	8.39	6.87	9.07	9.12
Nature trails with signs	7.46	6.46	8.69	7.18
Open trails near ponds	7.26	6.33	8.54	6.87
Picnic areas with shelters in open fields	5.57	5.14	7.63	4.01
Waterfront areas with beach	6.80	6.24	8.86	5.38
Forested areas with no obvious trails	5.17	2.93	4.83	7.54
Unpaved trails where only hiking is allowed	6.69	4.19	6.95	8.72
Picnic areas with tables in the forest	6.53	5.06	7.50	6.95
All purpose paved trails used by foot and bike traffic	5.98	5.28	8.12	4.58
All purpose trails along roads	5.17	4.62	7.49	3.47

Based on a ten point scale from 1 to 10.

Achieving Privacy Scale

To better understand the privacy needs of the respondents, four questions asked whether privacy was available at work and home, whether privacy was a motive for the respondent's park visit and to what degree was privacy achieved as a function of the respondent's park visit. The first two questions asked what level of privacy the respondent achieved at home and work. A ten-point scale was provided where 1=low level of privacy and 10=high level of privacy. Park visitors on average reported a greater level of privacy at home (mean=7.12) than at work (mean =4.13). The next questions asked how important was privacy as a motive for visiting the park on the day the research technician contacted the study participant. The importance of privacy as a motive for visiting the park fell into the middle range of the scale with a mean of 4.96. The last question asked whether the person was able to achieve their desired level of privacy. The mean for this question was 8.07.

A K-means cluster analysis was conducted with the first three questions to identify segments of respondents. This analysis was conducted after product moment correlations identified only weak and not-significant relationships among the four privacy questions. The segmentation analysis was conducted with the first three questions. Results suggest that four discrete groups exist. The first cluster has a high degree of privacy at home, work and desires privacy at an urban park. The second cluster has a high degree of privacy at home, little privacy at work and does not desire privacy out of a park visit. The third group has a high degree of privacy at home and at work, but does not desire privacy out of a park visit. The fourth cluster has little privacy at home or work, and does desire privacy out of a park visit. Results are presented in Table 10. Segmentation results indicate that desire for privacy from a park visit may or may not be related to the situations at home or work.

Table 10. Segmentation analysis of achievement of privacy at home and at work and desire for privacy from a park visit.

	Item Mean	Cluster one n=89	Cluster two n=81	Cluster three n=41	Cluster four n=64
Privacy level achieved at home	7.19	8.75	7.41	7.32	4.48
Privacy level achieved at work	4.13	5.35	2.10	6.83	3.36
How important is desire for privacy from visit	4.96	7.34	2.78	2.41	6.80

All questions based on a ten point unipolar scale with a range from 1 to 10.

Functions of Park Privacy Scale

The functions of park privacy scale is composed of 27 items that measure a range of reasons urban park users might seek privacy in a park. The items, ranked by means are presented in Table 11. Means ranged from 4.23 to 5.85, indicating moderate variation in importance of the items to the study population. The top ranked items deal with stress, fatigue and demands of everyday life.

Table 11. Functions of Park Privacy scale.

Item	Mean	Standard Deviation
As an emotional release from one's everyday life	5.85	1.23
For resting the mind from anxiety and mental fatigue	5.62	1.37
For releasing psychological stress	5.46	1.49
For experiencing a period of time away from others expectations	5.42	1.38
For a place to enjoy one's imagination	5.27	1.32
For being in an environment which inspires creative thought	5.26	1.33

Table 11 (cont). Functions of Park Privacy scale.

Item	Mean	Standard Deviation
For exploring and thinking through personal matters and concerns	5.25	1.40
For getting away to take a new and creative perspective	5.14	1.42
For being alone with one's individual thoughts and feelings	5.13	1.44
For getting away from everyday social roles	5.11	1.54
For recovering from troubled or depressing moments in one's life	5.11	1.63
For regrouping one's thoughts	5.07	1.37
As a relaxed period for reflecting upon past experiences	5.06	1.39
As an environment where one can maintain a desired "mental distance" from other individuals	4.95	1.59
For the development of individuality concerning personal and spiritual concerns	4.91	1.54
For maintaining a sense of individuality	4.83	1.51
For the opportunity to explore new ideas	4.80	1.43
As a private setting for communicating with a few friends	4.80	1.51
For self-evaluating and redirecting one's lifetime goals	4.68	1.65
For talking over personal matters with intimate friends	4.61	1.74
As an opportunity for sharing confidences and intimacies with trusted individuals	4.58	1.63
As a setting where one can limit communication to individuals who are close friends	4.51	1.52
For identifying one's inner self	4.50	1.53
For limiting visual and verbal interaction with strangers	4.48	1.61
For developing a sense of independence	4.42	1.49
As a place where one can control the information one must process	4.39	1.55
For evaluating and planning coming events	4.23	1.52

Based on a scale from 1 to 7. Where EU=extremely unimportant, U=unimportant, SU=Somewhat unimportant, N=neutral, SI=Somewhat important, I=important, EI=extremely important.

Factor analysis of the Functions of Park Privacy scale was conducted using principal component analysis with a vari-max rotation. All Cronbach alpha values were above .60.

The first factor is Reflective Thought. The grand mean for this factor is 5.01. The factor is composed of items dealing with thinking about one's past and current state of affairs. The second factor is Emotional Release Through Distancing. The grand mean for this factor is 5.32. The items describe the use of urban forests as a means of stress release by getting away from daily stressors. The third factor is Contemplating the Future. The grand mean for this factor is 4.52. The items describe the use of urban forests as places to think about and plan future events. The fourth factor is Intimate Communication. The grand mean for this factor is 4.66. The three items deal with being alone with close personal friends. The fifth factor is Creative Thought. This two-item factor deals with being in urban forests to stimulate creative thinking. The grand mean for this factor is 5.27. The last factor is Limited Contact.

This two-item factor consists of items describing the use of urban forests to limit contact with strangers. A K-means cluster analysis failed to identify meaningful clusters of urban forest visitors based on their answers to these scales.

Table 12. Factor Structure of Park Privacy Scale.

Factors	Mean	Loading	Alpha	Explained Variance
Reflective thought			.93	21.5
For identifying one's inner self	4.50	.77		
For the development of individuality concerning personal and spiritual concerns	4.91	.76		
For developing a sense of independence	4.42	.70		
A relaxed period for reflecting upon past experiences	5.06	.68		
For maintaining a sense of individuality	4.83	.67		
For regrouping one's thoughts	5.31	.65		
For resting the mind from anxiety and mental fatigue	5.62	.64		
For recovering from troubled or depressing moments in one's life	5.11	.63		
For being alone with one's individual thoughts and feelings	5.13	.61		
For exploring and thinking through personal matters and concerns	5.25	.59		
Emotional release by distancing			.83	12.2
For experiencing a period of time away from others expectations	5.42	.80		
As an emotional release from one's everyday life	5.85	.75		
For releasing psychological stress	5.46	.58		
For getting away from everyday social roles	5.11	.51		
For getting away to take a new and creative perspective	5.14	.49		
As an environment where one can maintain a desired "mental distance" from other individuals	4.95	.47		
Contemplating the future			.85	10.6
For the opportunity to explore new ideas	4.80	.80		
For self-evaluating and redirecting one's lifetime goals	4.68	.71		
As a place where one can control the information one must process	4.39	.69		
For evaluating and planning coming events	4.23	.54		

Table 12. Factor Structure of Park Privacy Scale.

Factors	Mean	Loading	Alpha	Explained Variance
Intimate communication			.85	12.0
As a private setting for communicating with a few friends	4.80	.83		
As an opportunity for sharing confidences and intimacies with trusted individuals	4.58	.79		
For talking over personal matters with intimate friends	4.61	.77		
Creative thought			.83	8.0
For being in an environment which inspires creative thought	5.26	.80		
For a place to enjoy one's imagination	5.27	.77		
Limiting Contact			.60	7.2
As a setting where one can limit communication to individuals who are close friends	4.51	.65		
For limiting visual and verbal interaction with strangers	4.48	.62		

Based on a scale from 1 to 7. Where EU=extremely unimportant, U=unimportant, SU=somewhat unimportant, N=neutral, SI=somewhat important, I=important, EI=extremely important.

Safety and Comfort in Park Areas Scale

This scale measures concerns about a day trip to an urban forest. The items are either fear related or deal with comfort issues. The scale is based on a six-point unipolar scale where 0=not concerned and 6=extremely concerned. The items are ranked and presented in Table 13. The means for most of the items are below 3.0, indicating than none of the items are a high concern for the study participants as a group. Two of the top five items dealt with emergency help. Unfriendly strangers and unfriendly dogs were also in this group. Typical for park studies, wayfinding was also an issue (No directional signs on the trails). The lowest ranked items were personal and psychological comfort items dealing with hiking being dirty, too slow, and boring.

Table 13. Concerns about a hypothetical day trip to a forested area.

Safety and Comfort	Mean	Standard Deviation
No law enforcement officers around in case of trouble	3.04	1.58
Unfriendly dogs off their leashes	2.98	1.79
Unfriendly strangers in the woods	2.97	1.76
No directional signs on the trails	2.94	1.59
Lack of quick emergency help	2.87	1.61
Too many mosquitoes	2.85	1.66
Fast bicyclists on the trails	2.62	1.69
No bathrooms nearby	2.62	1.74
Lack of drinking water	2.61	1.61
Rabid animals	2.60	1.93
Wild pack of dogs	2.48	2.06
Getting caught on the trails after dark	2.47	1.71
Getting poison ivy	2.47	1.75
No trail map	2.32	1.55
Caught in a sudden storm	2.22	1.57
Weeds that cause itching	2.18	1.70
Too many people	2.18	1.54
Getting lost on the hike	2.11	1.68
Getting caught in an afternoon thunderstorm	2.02	1.53
Stepping on a snake	2.02	1.91
No comfortable place to rest	1.98	1.58
Too many flies	1.94	1.64
Not having the energy to hike all day	1.83	1.57
Caught in a wind storm	1.82	1.60
Seeing a snake	1.76	1.67
Seeing wild animals	1.63	1.60
Falling branches in a windstorm	1.61	1.54
Horse manure on the trails	1.56	1.65
Spiders	1.35	1.56
Hiking would not be interesting	1.28	1.44
It is too easy to trip and fall on trails	1.25	1.45
The hike becoming boring	1.15	1.38
Hiking is hot and sweaty	.95	1.23
Hiking is just too slow	.88	1.11
Getting dirty	.67	.96

Based on a scale from 0 to 5 where 0=not concerned and 5=extremely concerned.

To further understand the perception of forests in terms of fears and personal comfort, the items were divided into fear items and comfort items and subjected to principal components factor analysis with vari-max rotation. The factor structure for the fear items is presented in Table 14. The items "No law enforcement officers around in case of trouble," "Lack of quick

Table 15. Factor Structure of the Comfort Items.

Factors	Mean	Loading	Alpha	Explained Variance
Disgust elicitors			.87	31.33
Weeds that cause itching	2.18	.86		
Getting poison ivy	2.47	.82		
No bathrooms nearby	2.62	.70		
Too many mosquitoes	2.85	.70		
Lack of drinking water	2.61	.70		
Horse manure on trails	1.56	.65		
Psychological stimulation	.84	28.27		
The hike becoming boring	1.52	.84		
Hiking is just too slow	.88	.79		
Hiking would not be interesting	1.28	.77		
Hiking is hot and sweaty	.95	.76		
Getting dirty	.67	.55		
Not having the energy to hike all day	1.83	.45		

Based on a scale from 0 to 5 where 0=not concerned and 5=extremely concerned.

Discussion of Descriptive Results

The reader is again cautioned that the sampling strategy used in this research was designed to maximize variation in the environmental preferences of park users, not to estimate population parameters. Reporting statistics from this study as if they accurately represent what percentage of park visitors' hold a certain preference or engaged in a behavior is an incorrect use of the data.

The empirical results in this chapter present a wide array of findings that clarify the importance of privacy as a motivation for vi
siting urban forests. The data describes the types of environments preferred by users, what environments are important for privacy, what types of privacy are sought in urban forest environments, the relationship between the availability of privacy at home and work and the desire for privacy from park visits, the fears and discomforts associated with forests, and the types of forests vegetation that are associated with fears and discomforts.

The first analyses of the survey results are descriptive. They provide several useful findings and establish the degree of reliability and validity of the measures. All measures except for one photographic environmental preference factor (large smooth surfaces) had acceptable internal reliability.

The basic demographics of the sample and behavior during the visit indicate that the sample does vary in terms of gender, family status, income, education, time spent at the reservations and use of different environments within the parks.

Environmental Preference

The photographic environmental preference scale measured how much respondents would like being in a variety of urban forest environments. Factor analysis indicates that park users potentially make distinctions based on the presence of trails, younger versus older trees, paved versus dirt paths, the presence of picnic tables and other structures such as railing, grassy versus brushy understory, manicured versus wild, and open areas with smooth surfaces. Woodland environments with some structures such as picnic tables or handrails were highest ranked for the entire study population. Water within a forest environment was also highly preferred. (see Table 5 and Figure 1)

Segmentation analysis presents a richer description of the environmental preferences of urban forest users. Several important groups were identified along with one group who seem to prefer all environments. The first group is topophobic, disliking wilder-looking environments. This group is not likely to enjoy urban forests unless they are predominantly open and manicured. The second group prefers wilder forests but only if there are trails present. One group preferred all environments except three environments, which are complex and disorderly. Since this group prefers wild environments with and without trails, they may dislike these areas for reasons related to their disorderly nature or lack of visual penetration. (see Table 6)

The segmentation analysis suggests two strategies in terms of catering to environmental preferences. First, most respondents were accepting of being in natural environments as long as trails are present. Providing a variety of trail types, varying by width and surface should accommodate a variety of urban forest users. The segment that disliked all environments except those that are golf course-like in appearance, presents serious management challenges. Modifying urban forests by reducing the number of trees and understory greatly reduces their value, both biological and social. At least one study suggests that dislike for wild environments is the result of a socialization process easily reversed by frequent experiences with natural environments, particularly during childhood (Bixler & Floyd, in press). A focus on change in the person rather than the physical environment seems to be the best, if not the only reasonable strategy.

Settings for Privacy

Right after completing the general environmental preference scale, respondents indicated how much they preferred seven different environments for obtaining privacy. Rankings were similar to general environmental preferences. Water and woodland areas with structures (picnic tables, signs) were top ranked. Open fields and areas near roads were lowest ranked. These findings indicate that settings are somewhat important in providing opportunities for privacy. The low ranking of "Forested areas with no obvious trails" should easily provide for privacy, but is not preferred for other reasons.

Factor analysis of the Settings for Privacy scale produced a three factor structure that provides similar information to that obtained from the photographic environmental preference scale. Forested areas, forested areas with amenities and developed park environments were the three environments. A pattern emerges with the two scales, that park users prefer forested environments that have some amenities (water, picnic tables, wide trails, signage, hand rails, bridges) over forested environments with no built structures or open green space. A segmentation analysis identified similar groups to those found in the segmentation analysis of the photographic environmental preference scale. One group preferred wilder areas, disliking open areas and trails next to roads. The second group liked all environments except those without trails. The third group preferred forested areas with amenities. A topophobic group, identified in the segmentation analysis of the photographic scale, was not found based on responses to this written scale.

The results from this scale suggest that providing at least two vegetation zones, forested with unimproved trails and forested with amenities (wide trails, signage, picnic tables, benches) would provide for the privacy needs of forest users.

Achieving Privacy in Urban Forests

One of the foci of this study is a better understanding of the importance of privacy as a motivation to visit urban forests. Of course, there are many other reasons for visiting an urban forest. Privacy could also be an unintended or ancillary outcome. Respondents were asked how much privacy they achieved at home and at work, how important privacy was as a motivation for visiting an urban forest, and whether a desired level of privacy was achieved. (see Table 10)

Not surprisingly, most respondents reported achieving a higher level of privacy at home than at work. Segmentation analysis identified four groups of park users. Two of the groups desired privacy from their park visits, two segments did not. One group achieved a high degree of privacy at home and at work and desired privacy from their park visit. The compensatory segment reported receiving little privacy at home or at work and desired privacy from their park visits. A third group reported achieving a high degree of privacy at home and at work, and did not desire such an experience at a park. Perhaps they desired a more public experience. A fourth group found desired levels of privacy at home, little privacy at work and did not desire privacy from park visits. This group may be achieving privacy at home and desiring some other benefit from a urban forest visit. An encouraging result of these sets of questions was that most respondents reported achieving a desired level of privacy (8.07 on a scale of 10). Not surprisingly, not all respondents desired privacy, but for two segments, privacy was reported as a desired outcome of visits to urban forests.

Functions of Park Privacy

This section of the study determined the different functions park privacy might play in a person's decisions to visit an urban forest. Factor analysis identified six factors that were Reflective Thought, Emotional Release by Distancing, Contemplating the Future, Intimate Communication, Creative Thought, and Limiting Contact. These factors are discussed in Chapter Four as predictive of desiring one type of urban forest setting over others.

Safety in Park Areas

Perceived hazards may limit the use of parks, particularly for those that have had little contact with forested areas. Vegetation may contribute to some of these concerns by blocking views. Safety issues involve wild animals, poorly supervised pets, wayfinding, reckless behavior of other recreationists, sudden storms, unfriendly strangers, and a perceived lack of help in emergencies.

Respondents rated a number of safety concerns. Top ranked was the lack of law enforcement officials followed by unfriendly dogs and strangers. Lack of wayfinding signs was also an issue. The availability of law enforcement is related to the other more specific issues in the scale. Management of inappropriate conduct by other forest users and effective wayfinding systems should help with these perceptions.

Factor analysis identified three clusters of safety related issues. The factor with the highest grand mean was the wild animals/people factor. Fast bicyclists, unfriendly strangers, dogs off their leash and wild/rabid animals were the items making up this factor. The second group was composed of items dealing with wayfinding/becoming lost and being caught in sudden storms. The third group dealt with spiders and snakes.

Dealing with fears in urban forests requires that all users understand park rules and an adequate law enforcement presence. Site change to deal with problem behaviors is problematic. For instance, increasing site distance on trails to accommodate fast moving bicyclists, lowers scenic beauty (less sense of mystery due to fewer curves in the trail) and increases the speed that bicyclists can travel. Environmental education along with frequent experiences outdoors can help reduce fears related to spiders and snakes.

Comfort in Park Areas

While fearful reactions to phenomena in urban parks are often dramatic, some individuals may avoid using urban forests simply because they are uncomfortable outdoors. Many of these issues occur with individuals who have had limited experience outdoors. A series of items measured concerns about comfort while being on a forest trip. Too many mosquitoes and concern about poison ivy were the two highest ranked items. Lack of bathrooms and drinking water were next in the ranking. High preferences for trails through woodland areas, identified in the environmental preference scales, may be somewhat related to concerns about mosquitoes, poison ivy and the lack of running water.

Lower ranked were items dealing with psychological stimulation. These items dealt with hiking being boring or slow and hot and sweaty. Frequent experiences outdoors along with outdoor education tend to lessen these types of attitudes.

Literature Cited

Bixler R. D., Floyd, M. F., & Hammitt, W. E. (in press) Environmental socialization: Tests of the childhood play hypothesis. Environment and Behavior.

Chapter Four
Urban Forest Vegetation and Privacy/Safety

Introduction

The purpose of this study is to better understand the importance of privacy among visitors to urban forests and to identify which micro-environments in forests provide for privacy. Balanced with the desire for privacy experiences are concerns for safety. In Chapter Three findings and implications from each of the scales used in the questionnaire were presented. In this chapter we examine the interrelationships among environmental preference and different levels and types of desire for privacy and safety and comfort concerns.

The analysis proceeds by using two different measures of environmental preference, examining how privacy and safety and comfort concerns predict environmental preference. The analyses uses the respondents' scores on environmental preference, measured two ways. The first scale is the Photographic Environmental Preference scale (Table 5 and Figure 2). The second scale is the Privacy Setting scale (Table 8). These are the dependent variables. The Photographic Environmental Preference scale produced seven dependent variables and the Privacy Setting scale produced three dependent variables.

The Functions of Park Privacy (Table 12) and the Fear (Table 14) and Comfort scale (Table 15) are the independent variables. These are the variables that should tell us something about why urban forest visitors prefer some environments over others. For each factor identified in Tables 12, 14 and 15, a composite score was calculated for each respondent. The Functions of Park Privacy scale produced six independent variables. The Fear and Comfort Scale produced six independent variables.

Interpreting Regression Analysis

The tables in Chapter Four are reports of linear regression analysis. Regression analysis is a form of correlation that allows a statistician to determine which variables out of a set of variables are related to an outcome or dependent variable. In this chapter, regression is used to understand how functions of privacy or safety and comfort concerns are related to, or predict environmental preference.

To interpret regression analysis there are two rules of thumb. The most widely accepted rule is that the (standardized) beta must be at least .10 and the p value must be less than or equal to .05 if the independent variable is to be considered significantly related to the dependent variable. In all the tables, if this rule is met, the variable name and numerical values are presented in bold lettering. The second rule of thumb that is less widely accepted is that the (standardized) beta value must be at least .10. If this rule is met, but not the .05 p value rule, only the beta value is presented in bold lettering.

Beta values are standardized, allowing the reader to compare the relative strengths of each variable in predicting environmental preference. A negative sign in front of the beta indicates an inverse relationship between the independent variables. That is, as the score for one of the variables goes up, the other one tends to go down in value.

At the bottom of each table, an R^2 value describes how much variance is explained by the analysis. Because privacy and fears and comforts are a small part of the motivations and cognitions that go into making decisions about environmental preferences, the R^2 values are not large. An R` of 1.0 means that all variance in the environmental preference variable is explained by the independent variables (function of privacy, safety and concerns). An R^2 of zero means that none of the variance in the environmental preference variable is explained by the independent variables.

Functions of Privacy in an Urban Forest as Predictors of Environmental Preference

Seven different environmental preference factors were identified through factor analysis. These factors are used as dependent variables and may be viewed as preference measures for seven different urban forest settings. The first set of analyses seeks to determine which of the six Functions of Urban Forest Privacy domains are related to the seven different environmental settings. The results are presented in Tables 16 through 22.

Table 16 provides results for settings characterized by younger trees with grassy and bushy undergrowth. Some of the scenes have no trail through them. None of the Functions of Privacy independent variables (IVs) were significant at the $p < .05$. Two IVs, Emotional Release by Distancing and Limiting Contact have standardized betas $> .10$. Both values were positive. These results provide very weak evidence that this type of setting provides an alternative environment for privacy and where contact with strangers can be limited to achieve privacy.

Table 16. Functions of Privacy in Urban Forests as a Predictor of Preference for Environments with Young Trees and Grassy and Bushy Undergrowth.

Independent Variables	Beta	t	p
Reflective Thought	-.090	-.98	.329
Emotional Release By Distancing	.142	1.69	.092
Contemplating the Future	.095	1.21	.227
Intimate Communication	-.070	-1.01	.312
Creative Thought	.093	1.32	.187
Limiting Contact	.111	1.61	.11

df = 6,319, F = 3.53, p = .002, R^2 = .045

Table 17 provides results for settings characterized by older trees, tall woody understory and woodland paths. One of the Functions of Privacy independent variables (IVs), Emotional Release by Distancing, was significant at the $p < .05$ with a standardized beta of .32. Additionally, three IVs, Reflective Thought, Intimate Communication and Creative Thought have standardized betas $> .10$. The first two variables have negative beta values, indicating that urban forest users seeking these outcomes are slightly less likely to prefer this setting.

The major result suggests that this type of setting provides an alternative environment from home and work for obtaining privacy.

Table 17. Functions of Privacy in Urban Forests as a Predictor of Preference for Environments with Older Trees, Tall Woody Understory and Woodland Paths.

Independent Variables	Beta	t	p
Reflective Thought	-.12	-1.32	.186
Emotional Release By Distancing	**.32**	**3.81**	**.000**
Contemplating the Future	-.04	-.51	.611
Intimate Communication	-.12	-1.81	.072
Creative Thought	**.10**	1.40	.164
Limiting Contact	.05	.74	.457

df = 6,325, F = 4.28. p = .001, R^2 = .056

Table 18 provides results for settings characterized by wide paved paths. Several of these scenes have roads next to the paths. Cleveland Metroparks visitors should readily associate these paths with the presence of a mixture of foot, bicycle and in-line skating traffic. None of the Functions of Privacy independent variables (IVs) were significant at the p < .05 level. Three IVs, Emotional Release by Distancing, Contemplating the Future, and Limiting Contact have standardized betas > .10. While the relationships are weak, they are intuitive. Emotional Release by Distancing and Limiting Contact are negatively related to preference for urban forest settings that are often busy with people.

Table 18. Functions of Privacy in Urban Forests as a Predictor of Preference for Environments with Wide Paved Trails.

Independent Variables	Beta	t	p
Reflective Thought	.08	.82	.412
Emotional Release By Distancing	**-.14**	-1.62	.105
Contemplating the Future	**.14**	1.76	.08
Intimate Communication	.08	1.12	.264
Creative Thought	.003	.04	.969
Limiting Contact	**-.10**	-1.49	.136

df = 6,326, F = 1.55. p = .16, R^2 = .01

Table 19 provides results for settings characterized by Environments with Water. Two of the Functions of Privacy independent variables (IVs), Emotional Release by Distancing and Intimate Communication are significant at the $p < .05$ level with a standardized beta of .178 and .177 respectively. Both variables have positive beta values, indicating that urban forest users seeking these outcomes are more likely to prefer this setting. The main result suggests that this type of setting provides an alternative environment from home and work for obtaining privacy and is attractive for social privacy.

Table 19. Functions of Privacy in Urban Forests as a Predictor of Preferences for Environments with Water.

Independent Variables	Beta	t	p
Reflective Thought	-.037	-.40	.688
Emotional Release By Distancing	**.178**	**2.13**	**.034**
Contemplating the Future	-.046	-.58	.561
Intimate Communication	**.177**	**2.60**	**.010**
Creative Thought	.038	.54	.59
Limiting Contact	-.078	-1.14	.254

$df = 6,328$, $F = 3.299$, $p = .004$, $R^2 = .04$

Table 20 provides results for settings characterized by Forested Areas with Structures. One of the Functions of Privacy independent variables (IVs), Emotional Release by Distancing, was significant at the $p < .05$ level with a standardized beta of .162. The relationship is positive. The main result suggests that this type of setting provides an alternative environment from the stresses of home and work for obtaining privacy.

Table 20. Functions of Privacy in Urban Forests as a Predictor of Preferences for Environments Consisting of Forested Areas with Structures.

Independent Variables	Beta	t	p
Reflective Thought	-.025	-.27	.787
Emotional Release By Distancing	**.162**	**1.94**	**.05**
Contemplating the Future	-.052	-.66	.510
Intimate Communication	.085	1.23	.217
Creative Thought	-.005	-.07	.944
Limiting Contact	.03	.44	.659

$df = 6,331$, $F = 1.963$. $p = .070$, $R^2 = .02$

Table 21 provides results for settings characterized by picnic areas that are moderately open with shade trees. These areas should be associated with larger numbers of people. Two of the Functions of Privacy independent variables (IVs), Emotional Release by Distancing and Intimate Communication were significant at the p < .05 level with a standardized beta of -.17 and .21 respectively. Additionally, two IVs, Reflective Thought and Limiting Contact had standardized betas > .10. Reflective Thought has a standardized beta with a positive value and the beta for Limiting Contact is negative. In combination, the results suggest that this setting is not an environment for getting away from daily stressors and limiting contact with people, but does have desirable characteristics for social privacy.

Table 21. Functions of Privacy in Urban Forests as a Predictor of Preference for Environments with Picnic Areas, Moderately Open with a few Large Trees and Shade.

Independent Variables	Beta	t	p
Reflective Thought	**.14**	1.53	.126
Emotional Release By Distancing	**-.17**	**-2.07**	**.040**
Contemplating the Future	.05	.70	.483
Intimate Communication	**.21**	**3.16**	**.002**
Creative Thought	.07	.96	.340
Limiting Contact	**-.12**	-1.73	.084

df=6,334, F=3.84, p=.001, R^2 =.048

Table 22 provides results for settings characterized by large open surfaces. This dependent variable has low reliability and should be interpreted with caution. No variables were significant with both a standardized betas > .10 and a p value < .05. One variable had a standardized beta value of .128. The sign is positive. This provides very weak support that this type of setting supports social privacy.

Table 22. Functions of Privacy in Urban Forests as a Predictor of Preference for Environments with Large Smooth Surfaces

Independent Variables	Beta	t	p
Reflective Thought	.018	.193	.847
Emotional Release By Distancing	-.023	-.273	.785
Contemplating the Future	.045	.577	.564
Intimate Communication	**.128**	1.863	.063
Creative Thought	.008	.112	.911
Limiting Contact	-.028	-.413	.680

df = 6,336, F = 1.15. p =.332, R^2 = .003

Table 25 provides results for settings characterized as developed park environments. None of the independent variables are significantly related the dependent variable. These findings suggest that developed park environments are not perceived as being important for park privacy.

Table 25. Functions of Privacy in Urban Forests as a Predictor of Preferences for Developed Park Environments for Obtaining Privacy.

Independent Variables	Beta	t	p
Reflective Thought	.038	.405	.686
Emotional Release By Distancing	-.05	-.588	.557
Contemplating the Future	**.12**	1.513	.131
Intimate Communication	.06	.911	.363
Creative Thought	-.02	-.210	.833
Limiting Contact	.06	.797	.426

$df=6,324$, $F=1.87$. $p=.084$, $R^2=.016$

Safety and Comfort as Predictors of Environmental Preference

Seven different environmental preference factors were identified through factor analysis. These factors are used as dependent variables and may be viewed as preference measures for seven different urban forest settings. The first set of analyses seeks to determine which of the Safety and Comfort domains are related to the seven different environmental settings. The results are presented in Tables 26 through 32.

Table 26 provides results for settings characterized by younger trees with grassy and bushy undergrowth. Many of the scenes have no trail through them. Three of the comfort and safety variables are significant with a standardized beta $> .10$ and a p value $< .05$. Comfort is negatively related to environmental preference, indicating that those who view hiking as slow or boring hold a lower preference for these environments. Spiders/Snakes is negatively related to environmental preference, indicating that urban forest users who report greater concern about these animals have lower preference for these types of settings. Wild People/Animals, which contains items about dogs off of leashes, unfriendly strangers and fast bicyclists is positively related to preference for wild-looking but young forest environments. Respondents' who prefer these environments are more likely to be concerned about incidents with other people. The Lost variable has a standardized beta of -.144, but does not reach the $p = .05$ level of significance. This result provides very weak support that concern about becoming lost or caught in storms is negatively related to environmental preference.

Table 26. Functions of Privacy in Urban Forests as a Predictor of Preference for
Environments with Young Trees and Grassy and Bushy Undergrowth.

Independent Variables	Beta	t	p
Comfort	**-.20**	**-2.225**	**.027**
Boredom	.011	.146	.884
Help	.000	-.004	.997
Lost	**-.144**	-1.422	.156
Spiders/Snakes	**-.261**	**-3.401**	**.001**
Wild People/Animals	**.250**	**3.04**	**.003**

df=6,327, F=10.141, p=.001, R^2 =.14

Table 27 provides results for settings characterized by older trees, tall woody understory and woodland paths. Spiders/Snakes is significant with a standardized beta > .10 and a p value < .05. Spiders/Snakes is negatively related to environmental preference, indicating that urban forest users who report greater concern about these animals have lower preference for these types of settings. The Comfort variable has a standardized beta of -.119, but does not reach the p = .05 level of significance. This result provides very weak support that concerns about lack of readily available amenities is negatively related to environmental preference. Wild People/Animals also has a standardized beta of .145 but does not reach significance. This result provides very weak support that concerns about conduct of people in forests is positively related to environmental preference.

Table 27. Functions of Privacy in Urban Forests as a Predictor of Preference for
Environments with Older Trees, Tall Woody Understory and Woodland
Paths.

Independent Variables	Beta	t	p
Comfort	**-.119**	-1.347	.179
Boredom	-.060	-.799	.425
Help	.028	.320	.749
Lost	-.099	-.987	.324
Spiders/Snakes	**-.288**	**-3.765**	**.001**
Wild People/Animals	**.145**	1.757	.080

df=6,330, F=10.27, p=.001, R^2 =.142.

Table 28 provides results for settings characterized by wide paved paths. Spiders/Snakes is significant with a standardized beta > .10 and a p value < .05. Spiders/Snakes is positively related to environmental preference, indicating that urban forest users who report greater concern about these animals have higher preference for these types of settings. The Help variable has a standardized beta of .151, but does not reach the $p = .05$ level of significance. This result provides very weak support that concerns about lack of readily available help is positively related to preference for these settings.

Table 28. Functions of Privacy in Urban Forests as a Predictor of Preference for Environments with Wide Paved Trails.

Independent Variables	Beta	t	p
Comfort	.029	.301	.763
Boredom	.003	.041	.967
Help	**.151**	1.638	.102
Lost	.025	.232	.816
Spiders/Snakes	**.165**	**2.023**	**.044**
Wild People/Animals	-.131	-1.48	.14

df=6,336, F=3.523, p=.002, R^2 =04.

Table 29 provides results for settings characterized by presence of water. None of the variables reach significance, although the Help variable has a standardized beta of .10.

Table 29. Functions of Privacy in Urban Forests as a Predictor of Preferences for Environments with Water

Independent Variables	Beta	t	p
Comfort	.044	.475	.635
Boredom	-.035	-.442	.658
Help	**.102**	1.112	.267
Lost	.001	.012	.990
Spiders/Snakes	-.001	-.014	.989
Wild People/Animals	.096	1.094	.275

df=6,340, F=2.3, p=.034, R^2 =022.

Table 30 provides results for settings characterized by forested areas with structures. None of the independent variables are significant with a standardized beta > .10 and a *p* value < .05. Spiders/Snakes is negatively related to environmental preference with a beat of -.158. This result provides very weak support that concerns about snakes and spiders is negatively related to preference for these settings.

Table 30. Functions of Privacy in Urban Forests as a Predictor of Preferences for Environments Consisting of Forested Areas with Structures.

Independent Variables	Beta	t	p
Comfort	-.031	-.328	.743
Boredom	-.049	-.610	.542
Help	.000	.001	.999
Lost	-.026	-.238	.812
Spiders/Snakes	-.158	-1.93	.055
Wild People/Animals	.101	1.143	.254

df=6,336, F=1.96, p=.071, R^2 =.017

Table 31 provides results for settings characterized by picnic areas in open areas with shade trees. None of the independent variables are significant with a standardized beta > .10 and a *p* value < .05. Help is positively related to environmental preference with a beta of .168. This result provides very weak support that concerns about the availability of help in an emergency is positively related to preference for these environments.

Table 31. Functions of Privacy in Urban Forests as a Predictor of Preference for Environments with Picnic Areas, Moderately Open with a few Large Trees and Shade.

Independent Variables	Beta	t	p
Comfort	.019	.208	.836
Boredom	-.053	-.680	.497
Help	**.168**	**1.843**	**.066**
Lost	.047	.447	.655
Spiders/Snakes	.059	.735	.463
Wild People/Animals	.030	.346	.730

df=6,340, F=3.90, p=.001, R^2 =.05

Table 32 provides results for settings characterized by large open surfaces. This variable has low reliability and should be interpreted with caution. Boredom was significant with both a standardized betas > .10 and a p value < .05. This independent variable is negatively related to preference for environments with large smooth surfaces, suggesting that those who are easily bored with outdoor activities are less likely to prefer these environments.

Table 32. Functions of Privacy in Urban Forests as a Predictor of Preference for Environments with Large Smooth Surfaces.

Independent Variables	Beta	t	p
Comfort	**-.16**	-1.74	.082
Boredom	-.168	-2.123	.034
Help	**.175**	1.899	.058
Lost	.012	.110	.912
Spiders/Snakes	**.122**	1.497	.135
Wild People/Animals	-.028	-.324	.746

df=6,342, F=1.91, p=.079, R^2=.015

Safety and Comfort Concerns as Predictors of Environmental Preference Preferred for Privacy

This set of analyses provides a similar set of findings to Tables 26 to 32. The dependent variables used in these analyses are also measure of urban forest environmental preferences, but are more specific. The questions in the survey ask to what degree a number of park environments are desirable for obtaining privacy. These measures also used a different method (written versus photographic stimuli).

Table 33 provides results for settings characterized as wilder forested environments, some without trails, preferred for privacy. The items making up the factor describe less developed areas with few if any amenities. Two variable, Help and Spiders/Snakes have standardized beta values greater than .10 and a significance level < .05. Both betas are negatively related to the dependent variable. This suggests that individuals concerned about the lack of immediate help in emergencies, and those more fearful of snakes and spiders are less likely to prefer these environments. The beta value for Wild People/Animals is greater than .10 but does not reach significance. This provides very weak evidence that respondents' concerned about unfriendly strangers, dogs off leashes and fast bicyclists are more likely to prefer these environments.

Table 33. Functions of Privacy in Urban Forests as a Predictor of Preference for Forested Environments for Obtaining Privacy.

Independent Variables	Beta	t	p
Comfort	.055	.63	.527
Boredom	.088	1.19	.236
Help	**-.175**	**-1.99**	**.047**
Lost	-.157	-1.56	.121
Spiders/Snakes	**-.342**	**-4.47**	**.000**
Wild People/Animals	**.159**	1.92	.055

df=6,329, F=10.23. p=.001, R^2 =.142

Table 34 provides results for settings characterized as forested environments with amenities preferred for privacy. Spiders/Snakes has a standardized beta values greater than .10 and a significance level < .05. The standardized beta is negatively related to the dependent variable. This suggests that individuals more fearful of snakes and spiders are less likely to prefer these environments. The beta values for Boredom and Lost are greater than .10 but do not reach significance. This provides very weak evidence that respondents' disinterested in hiking or concerned about becoming lost are more likely to prefer these settings.

Table 34. Functions of Privacy in Urban Forests as a Predictor of Preferences for Forested Areas with Amenities for Obtaining Privacy.

Independent Variables	Beta	t	p
Comfort	.013	.13	.894
Boredom	**.113**	1.41	.159
Help	.088	.93	.351
Lost	**.129**	1.19	.237
Spiders/Snakes	**-.208**	**-2.51**	**.013**
Wild People/Animals	-.052	-.58	.562

df=6,328, F=1.78, p=.103, R^2 =.014

Table 35 provides results for settings characterized as developed environments for obtaining privacy. None of the variables reached significance. This finding suggests that developed park environments do not evoke safety and comfort concerns.

Table 35. Functions of Privacy in Urban Forests as a Predictor of Preferences for Developed Park Environments for Obtaining Privacy.

Independent Variables	Beta	t	p
Comfort	.018	.19	.846
Boredom	.073	.94	.349
Help	.072	.78	.435
Lost	.095	.90	.371
Spiders/Snakes	.048	.60	.549
Wild People/Animals	.036	.41	.681

$df = 6,329, F = 5.12, p = .001, R^2 = .07$

Discussion and Conclusions

Two different measures of environmental preference for urban forest environments were used in these analyses to understand how the desire for privacy, and concerns about fear and comfort play a role in urban forest visitors' perceptions of environments. The strengths of relationships are not strong, and should not be, since there are many other variables that are involved in environmental preferencing. The results point to the wilder urban forest environments as being preferred for privacy. The Emotional Release by Distancing variable, which is composed of items dealing with escaping stress of daily life, is consistently related to preference for the wilder urban forest environments. These results suggest that an urban forest environment, as a contrast to urban and suburban life of manicured and built environments, is one important setting to maintain and make available to people in park setting.

The other variable that was significant was the Intimate Communication variable. This variable is composed of items dealing with being away with friends. Significant relationships appeared with areas with water settings and picnic-like settings with trees and open space. These findings suggest that urban forests may function as social settings and that the presence of water and areas with less dense vegetation with amenities are supportive of valued social interactions.

Several different settings in urban forests are important for privacy outcomes. Large open spaces seem to hold little importance for privacy outcomes while wilder urban forests and picnic areas, observational decks, paved trails provide for different privacy outcomes.

The analyses establish that urban forests are used for privacy outcomes and that they are important as contrasting physical environments to built environments. But there are also forces working against visiting. This question was explored by analyzing how various safety

and comfort concerns were related to environmental preferences. Results paint an intuitive picture. Individuals who were concerned about the lack of immediate help in cases of emergency and those fearful of snakes and spiders reported lower preferences for the wilder urban forest environments. These visitors preferred wide paved paths and open picnic areas. In contrast, respondents who preferred wilder urban forest areas, were concerned about such issues as unfriendly strangers, dogs off of leashes and fast moving bicyclists. There was limited evidence that concern about getting lost is also an issue.

These findings suggest several strategies. First, different trail widths and surfaces provide choices for individuals with different safety and comfort concerns. Width of trail provides varying degrees of intimacy with the vegetation in urban forests. Providing some trails next to or near road offers an urban forest experience with an increased sense of safety in terms of quick response in case of emergencies. Continuing to teach trail etiquette and enforce trail rules about dogs on leashes and speed of travel on bicycles will increase the satisfaction of people using the wilder parts of urban forests.

A long-term solution to many safety and comfort concerns is education and socialization. Repeated experiences outdoors in forests, particularly during childhood, helps reduce the expectation of encountering feared animals such as snakes, develops wayfinding skills and increases people's tolerance of ambient conditions in outdoor settings. Outdoor education can provide a cognitive influence in understanding risks in urban-forest settings.

In summary, urban forests are used to provide privacy experiences mostly as a need to get away from daily urban stresses. Two sets of safety and comfort concerns exist. One group tends to avoid wilder areas of urban forests out of fear of snakes, spiders and getting lost. The other group prefers wilder environments but is concerned about the behavior of other people and their dogs.

Appendix A

The Questionnaire

PHOTO SURVEY
ENVIRONMENTAL PREFERENCES
IN URBAN FOREST RESERVES
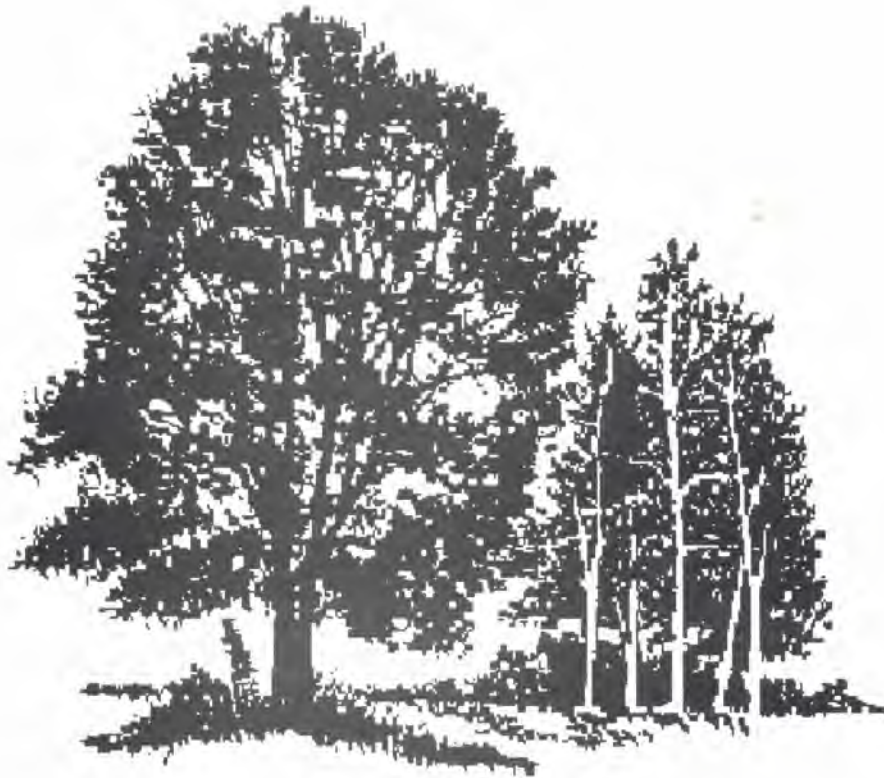
ENVIRONMENTAL PREFERENCES IN URBAN FOREST RESERVES

Thank you for agreeing to participate in this study. The information you provide will be used to make management decisions in U.S. park districts similar to Cleveland Metroparks. The findings will be of particular help to landscape architects and park planners. We are interested in learning about your recent park visit during which you were contacted by Clemson University staff. All of your answers in this study are strictly confidential, and your name and address will be _erased_ from our reminder mailing list once we receive your completed questionnaire. A self-addressed postage paid envelope is provided for your convenience.

If you have any questions concerning this study, please contact:

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Rbixler@clemson.edu

SECTION 1: A FEW QUICK QUESTIONS ABOUT YOUR VISIT

Please answer these questions based on your visit to the park the day Clemson University staff asked you to participate in this study:

1. The day of the visit, did you:

    _____ visit alone--please go to Question 4.

    _____ visit with a group of people--please go to Question 2

2. What type of group were you with when you visited the park? (Please check one category)

    _____ with friends
    _____ with family
    _____ with family and friends
    _____ with an organized club
    _____ other (please describe)_____

3. Were there children (12 years of age or less) with your group? _____ Yes _____ No

4. What were the one or two major activities you engaged in during this park visit?

    1. _____

    2. _____

5. What area(s) or facility(ies) of the park did you use during your visit? (check all that apply)

_____ picnic area

_____ paved all purpose trails

_____ unpaved trails through woods and meadows

_____ unpaved trails along rivers or lakes

_____ off-trail hiking

_____ mowed fields

_____ nature center

_____ other (please specify)_____

6. Approximately how long did your park visit last?

_____ hours and _____ minutes

7. How did you travel to the park?

___ by car   ___ bicycled   ___ walked   ___ jogged

SECTION 2: PARK SETTINGS

On the next few pages are photographs of park areas. **Imagine yourself in each area.** Then rate how much you would like or dislike being in each park area by circling one number under each photograph.

| -3 | -2 | -1 | 0 | 1 | 2 | 3 |
| Dislike | | | | | | Like |

| -3 | -2 | -1 | 0 | 1 | 2 | 3 |
| Dislike | | | | | | Like |

3

-3   -2   -1   0   1   2   3

Dislike   Like

-3   -2   -1   0   1   2   3

Dislike   Like

-3   -2   -1   0   1   2   3

Dislike   Like

-3   -2   -1   0   1   2   3

Dislike   Like

-3   -2   -1   0   1   2   3

Dislike   Like

-3   -2   -1   0   1   2   3

Dislike   Like

-3   -2   -1   0   1   2   3

Dislike   Like

-3   -2   -1   0   1   2   3

Dislike   Like

-3   -2   -1   0   1   2   3

Dislike   Like

-3   -2   -1   0   1   2   3

Dislike   Like

-3   -2   -1   0   1   2   3

Dislike   Like

-3   -2   -1   0   1   2   3

Dislike   Like

5

-3   -2   -1   0   1   2   3

Dislike   **Like**

-3   -2   -1   0   1   2   3

Dislike   **Like**

-3   -2   -1   0   1   2   3

Dislike   **Like**

-3   -2   -1   0   1   2   3

Dislike   **Like**

-3   -2   -1   0   1   2   3

Dislike   **Like**

-3   -2   -1   0   1   2   3

Dislike   **Like**

-3   -2   -1   0   1   2   3

Dislike   **Like**

-3   -2   -1   0   1   2   3

Dislike   **Like**

-3   -2   -1   0   1   2   3

Dislike   **Like**

-3   -2   -1   0   1   2   3

Dislike   **Like**

-3   -2   -1   0   1   2   3

Dislike   **Like**

-3   -2   -1   0   1   2   3

Dislike   **Like**

-3   -2   -1   0   1   2   3

Dislike   Like

-3   -2   -1   0   1   2   3

Dislike   Like

-3   -2   -1   0   1   2   3

Dislike   Like

-3   -2   -1   0   1   2   3

Dislike   Like

-3   -2   -1   0   1   2   3

Dislike   Like

-3   -2   -1   0   1   2   3

Dislike   Like

8

-3   -2   -1   0   1   2   3

Dislike   **Like**

-3   -2   -1   0   1   2   3

Dislike   **Like**

-3   -2   -1   0   1   2   3

Dislike   **Like**

-3   -2   -1   0   1   2   3

Dislike   **Like**

-3   -2   -1   0   1   2   3

Dislike   **Like**

-3   -2   -1   0   1   2   3

Dislike   **Like**

Before you begin, please read this definition of privacy which will be used throughout the survey:

> PRIVACY is the opportunity to control your contact with other people (e.g. who you speak with, are near to, or even see). However, privacy does not refer to just being alone by oneself. Privacy can be experienced with a friend, a family member, or even with a group of people you <u>choose</u> to be with.

1. Parks offer some places where people can enjoy privacy. To what degree do you prefer each of the following park settings for experiencing privacy. (Please circle one number after <u>each</u> statement)

	Do not prefer this setting for privacy								Prefer this setting for privacy	
-trails densely forested on both sides	1	2	3	4	5	6	7	8	9	10
-trails with park open space on one side	1	2	3	4	5	6	7	8	9	10
-open park fields	1	2	3	4	5	6	7	8	9	10
-forested trails along running water	1	2	3	4	5	6	7	8	9	10
-nature trails with signs	1	2	3	4	5	6	7	8	9	10
-open trails near ponds	1	2	3	4	5	6	7	8	9	10
-picnic areas with shelters in open fields	1	2	3	4	5	6	7	8	9	10
-waterfront areas with beach	1	2	3	4	5	6	7	8	9	10
-forested areas with no obvious trails	1	2	3	4	5	6	7	8	9	10
-unpaved trails where only hiking is allowed	1	2	3	4	5	6	7	8	9	10
-picnic areas with tables in the forest	1	2	3	4	5	6	7	8	9	10
-all purpose paved trails used by foot and bike traffic	1	2	3	4	5	6	7	8	9	10
-all purpose trails along roads	1	2	3	4	5	6	7	8	9	10

2. Please rate the level of privacy you are typically able to achieve at home (please circle one number below).

Low level of privacy			**Moderate level of privacy**					**High level of privacy**	
1	2	3	4	5	6	7	8	9	10

3. Please rate the level of privacy you are typically able to achieve at work. Skip this question if you do not work away from home.

Low level of privacy			**Moderate level of privacy**					**High level of privacy**	
1	2	3	4	5	6	7	8	9	10

4. On the day you were contacted by the research staff, please rate below how important a desire for privacy was in your choice to visit the park.

Privacy not important									**Privacy very important**
1	2	3	4	5	6	7	8	9	10

5. Please indicate below to what extent you achieved your desired level of privacy during your park visit.

Did not achieve my desired level of privacy									**Fully achieved my desired level of privacy**
1	2	3	4	5	6	7	8	9	10

SECTION 4: PARK PRIVACY

1. Privacy found in parks may serve many <u>specific functions:</u> Please indicate how important the following specific functions of privacy are to you when visiting the Cleveland Metroparks. Please circle one item for each question.

	Extremely Unimportant	Unimportant	Somewhat Unimportant	Neutral	Somewhat Important	Important	Extremely Important
-for getting away to take a new and creative perspective	EU	U	SU	N	SI	I	EI
-for experiencing a period of time away from others expectations	EU	U	SU	N	SI	I	EI
-as an emotional release from everyday life	EU	U	SU	N	SI	I	EI
-for self-evaluating and redirecting one's lifetime goals	EU	U	SU	N	SI	I	EI
-for evaluating and planning coming events	EU	U	SU	N	SI	I	EI
-as a place where one can control the information one must process	EU	U	SU	N	SI	I	EI
-as a setting where one can limit communication to individuals who are close friends	EU	U	SU	N	SI	I	EI
-for getting away from everyday social roles	EU	U	SU	N	SI	I	EI
-for the opportunity to explore new ideas	EU	U	SU	N	SI	I	EI

	Extremely Unimportant	Unimportant	Somewhat Unimportant	Neutral	Somewhat Important	Important	Extremely Important
-for talking over personal matters with intimate friends	EU	U	SU	N	SI	I	EI
-for a place to enjoy one's imagination	EU	U	SU	N	SI	I	EI
-for being in an environment which inspires creative thought	EU	U	SU	N	SI	I	EI
-as an environment where one can maintain a desired "mental distance" from other individuals	EU	U	SU	N	SI	I	EI
-as an opportunity for sharing confidences and intimacies with trusted individuals	EU	U	SU	N	SI	I	EI
-for releasing psychological stress	EU	U	SU	N	SI	I	EI
-for recovering from troubled or depressing moments in one's life	EU	U	SU	N	SI	I	EI
-for maintaining a sense of individuality	EU	U	SU	N	SI	I	EI
-for exploring and thinking through personal matters and concerns	EU	U	SU	N	SI	I	EI
-as a relaxed period for reflecting upon past experiences	EU	U	SU	N	SI	I	EI
-for resting the mind from anxiety and mental fatigue	EU	U	SU	N	SI	I	EI
-for the development of individuality concerning personal and spiritual concerns	EU	U	SU	N	SI	I	EI
-for developing a sense of independence	EU	U	SU	N	SI	I	EI
-for identifying one's inner self	EU	U	SU	N	SI	I	EI
-for limiting visual and verbal interaction with strangers	EU	U	SU	N	SI	I	EI
-for regrouping one's thoughts	EU	U	SU	N	SI	I	EI
-as a private setting for communicating with a few friends	EU	U	SU	N	SI	I	EI
-for being alone with one's individual thoughts and feelings	EU	U	SU	N	SI	I	EI

SECTION 5: COMFORT AND SAFETY IN PARK AREAS

You have been invited to spend a full day hiking in a national forest with mountains, large trees, creeks, and rivers. The forest is a 1.5-hour drive into Pennsylvania. As you think about what the day might be like, how concerned would you be that these things might happen if you take this day trip:

How concerned might you be about:	not concerned		moderately concerned		extremely concerned	
-falling branches in a windstorm	0	1	2	3	4	5
-getting caught on the trails after dark	0	1	2	3	4	5
-not having the energy to hike all day	0	1	2	3	4	5
-unfriendly strangers in the woods	0	1	2	3	4	5
-unfriendly dogs off their leashes	0	1	2	3	4	5
-fast bicyclists on the trails	0	1	2	3	4	5
-getting dirty	0	1	2	3	4	5
-getting lost on the hike	0	1	2	3	4	5
-caught in a sudden storm	0	1	2	3	4	5
-getting poison ivy	0	1	2	3	4	5
-horse manure on the trails	0	1	2	3	4	5
-weeds that cause itching	0	1	2	3	4	5
-lack of drinking water	0	1	2	3	4	5
-lack of quick emergency help	0	1	2	3	4	5
-getting caught in an afternoon thunderstorm	0	1	2	3	4	5
-no bathrooms nearby	0	1	2	3	4	5
-no directional signs on the trails	0	1	2	3	4	5
-caught in a wind storm	0	1	2	3	4	5
-too many mosquitoes	0	1	2	3	4	5

How concerned would you be about:	not concerned		moderately concerned		extremely concerned	
-no law enforcement officers around in case of trouble	0	1	2	3	4	5
-seeing a snake	0	1	2	3	4	5
-no trail map	0	1	2	3	4	5
-hiking would not be interesting	0	1	2	3	4	5
-rabid animals	0	1	2	3	4	5
-no comfortable place to rest	0	1	2	3	4	5
-seeing wild animals	0	1	2	3	4	5
-spiders	0	1	2	3	4	5
-the hike becoming boring	0	1	2	3	4	5
-it is too easy to trip and fall on trails	0	1	2	3	4	5
-hiking is hot and sweaty	0	1	2	3	4	5
-wild pack of dogs	0	1	2	3	4	5
-too many flies	0	1	2	3	4	5
-too many people	0	1	2	3	4	5
-hiking is just too slow	0	1	2	3	4	5
-stepping on a snake	0	1	2	3	4	5

SECTION 6: VISITOR INFORMATION

To finish the study we need a profile of our study participants is identical to other profiles of park users. None of the information in this or other sections will be associated with you.

1. Year of birth **19** __ __

2. I am ____ **Male**   _____ **Female**

3. What is the highest level of education you have completed so far? (please circle one number)

Elementary	**High School**	**College**	**Graduate Study**
5 6 7 8	9 10 11 12	13 14 15 16	17 18 19 20+

14

4. What is your current occupation? (please check the most appropriate category)

____ Professional & Technical	____ Machine Operator
____ Managers & Administrators	____ Laborer
____ Sales	____ Farmer
____ Clerical	____ Service Worker
____ Craftsperson	____ Homemaker
____ Student	____ Retired
____ Other (please specify)_____	

5. What is your ethnic background? (please check one answer)

____ Hispanic American	____ Asian American
____ Black or African American	____ American Indian or Native American
____ White or European-American	____ Other (please specify)_____

6. What is your yearly total household income, before taxes? (please check one answer)

____ less than $20,000
____ $20,000-$39,999
____ $40,000-$59,999
____ $60,000-$79,999
____ $80,000-$99,999
____ $100,000 or more

7. What is the nature of your current residence? (please check one answer)

____ House
____ Townhouse
____ Condominium
____ Apartment
____ Other (please specify)_____

8. Where is your current home located? (please check one)

____ In a city
____ In a suburb
____ In a small town
____ In the country
____ On a farm

9. Are you a professional or avid amateur photographer?   ____ Yes   ____ No

PLEASE MAIL THE COMPLETED STUDY IN THE ENVELOPE PROVIDED.

THANKS AGAIN FOR YOUR HELP AND COOPERATION!

NO STAMP IS NECESSARY.