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Recreational Use of Forested Areas by Alabama Residents

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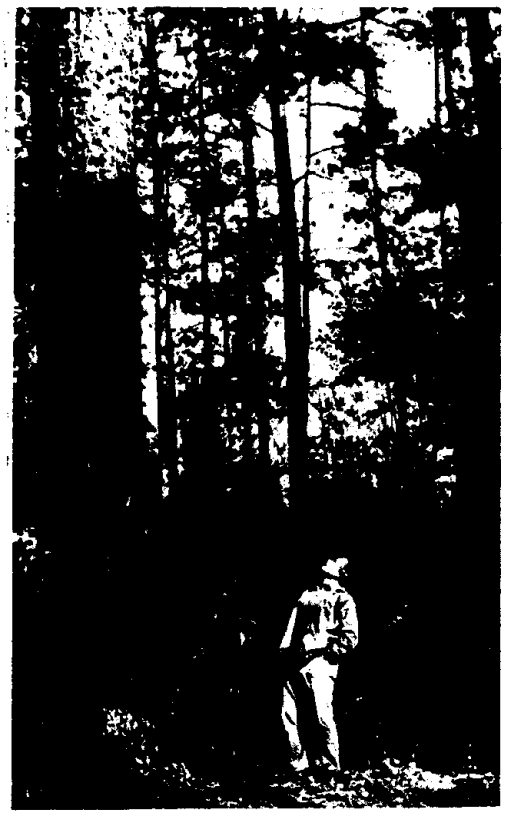

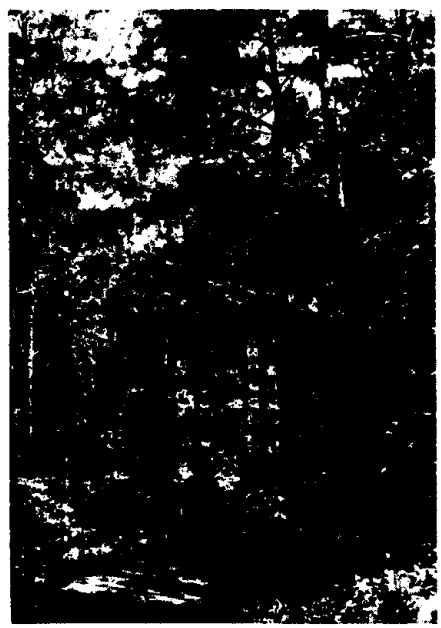

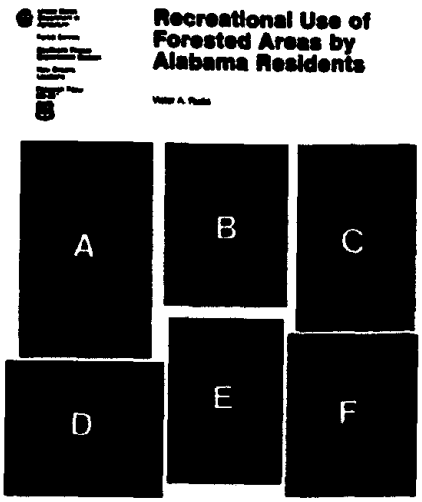

Front Cover

Forested areas can be classified as having certain characteristics, e.g. (A) large diameter trees, (B) limited screening or open and parklike, (C) near roads, (D) adjacent to water bodies, (E) dense vegetative screening, and (F) near farms. The importance of forested areas as a recreation resource differs with respect to forest characteristics and the leisure activities and preferences of users.

ACKNOWLEDGEMENTS

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CONTENTS

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INTRODUCTION

Periodic surveys of forested areas have been conducted by USDA Forest Service since the 1930's. The surveys at first only monitored the status and trends of the Nation's timber supplies. Regional estimates served as bases for National reports and were derived largely from sample-based measures of both private and public forest resources. Legislation in the 1970's mandated further that the Forest Service make comprehensive assessments of forest resources, including recreation.

To use these ongoing timber-oriented surveys for monitoring forest recreation resources, procedures are needed to classify sampled areas in terms relevant to recreation assessments. One established classification scheme is the Recreation Opportunity Spectrum (ROS). It has been developed to aid public land managers and planners inventory available recreation opportunities for a parcel of land (Clark and Stankey 1979). The system classifies areas into 5 or 6 settings ranging from those that provide a primitive experience to those that provide a modern or urban experience. The ROS guidelines have been used to make assessments of the range of recreation resources on many Forest Service landholdings and on some other federal lands (Buist and Hoots 1982).

Standard criteria are used to make the ROS guidelines operational for particular landscapes (Brown and others 1980). Suggested standards with examples largely drawn from the Rocky Mountain region have been incorporated in the ROS Users Guide (U.S. Forest Service 1982) for land and management planning within the National Forest System. The standards consist of a series of qualitative descriptions and quantitative measures designed for complete enumeration of agency lands, or in-place inventories. These standards have also been used in extensive area sample-based inventories by some Forest Service Inventory and Analysis (FIA) units to categorize recreation resources of private as well as public forested areas (Doman and others 1981, Labau 1984, Northeastern FIA Unit 1984).

While the concepts of the ROS for assessing recreation resources are widely recognized, application is not straightforward (Clark 1982). The ROS guidelines provide a framework for inventories; their use for monitoring supplies has not been fully developed (Stankey and others 1983). Human values and perceptions play a major role in assessing recreation resources and decision making; knowledge about users and nonusers of forested areas is essential. For this reason, ROS guidelines favor local evaluation by those informed about resource conditions and users. Validation and refinement of the classification standards for particular landscapes are needed to adjust for differences in resource characteristics and the people who use them (Lee and others 1983). Also, standards appropriate to southern forest users, and to the dense vegetation and relatively level terrain of southern landscapes are not known.

Other approaches to recreation resource assessment have concentrated on aerial photo interpretation, field observation, and field evaluation suggested by managers, researchers, and the literature (Burnett and Conklin 1979, Green 1979, McClure and others 1979, Rudis 1983, Saunders 1979). Several of these measurements have been adapted for use with sample-based inventories of forested areas. Objective, replicable measures that can be applied consistently over extensive areas appear cost-effective. One way is to couple measurements from aerial photos with maps and experienced interpreters (Green 1979). Lacking, however, are classification procedures based on these measures that can be tied to a range of recreation opportunities.

Regional assessments drawn from qualitative descriptions and comparisons of field evaluation data can be misleading. Temporal and spatial consistency in judgment is difficult to maintain in extensive area surveys. "Remoteness," an ROS standard based largely on a quantifiable distance from roads, has been favored over other more qualitative descriptions where ROS guidelines have been applied (Neal Kingsley, Northeastern FIA Unit, personal communication, 1981). Knowledge about users is generally limited to

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evidence of human intrusions. Classifying recreation areas based on evidence of the type and intensity of human intrusions restricts assessments to judgment of activities and individuals that leave evidence, rather than actual recreational uses. The frequency of evidence on sampled plots can also vary widely among regions, suggesting differences in judgment by field personnel (Rudis 1983), or differences in users or resource attributes (Saunders 1982).

The focus of this study is to begin to address the above needs. Basic information is presented on the socioeconomics of forest use and nonuse in Alabama, the importance of several leisure activities and preferences, and the relative value of several offsite and onsite forest attributes to ROS preferences. Attributes in this study include distance from residence, forest land ownership, distance from other land uses, size of the nearby water body, restrictions to access (i.e. signs and fences), forest type, size, age, vegetative screening, conveniences, and human intrusions.

This study examines where respondents go to pursue leisure activities. As such, conclusions from this examination will more likely be suited to assessing attributes of forest areas used, rather than preferred attributes of forested areas.

Measures appropriate to sample-based extensive timber inventories, and to the relatively dense forests typical of Alabama are discussed. Since developed recreation areas usually are excluded from timber surveys, emphasis in this study is on distinguishing attributes at the "primitive-end" of the recreation opportunity spectrum.

METHODS

The approach in this study questioned household individuals about their leisure activities in forested areas. Sociodemographic information gathered was assessed as to importance in characterizing nonuse, forest use, and forest user preferences. Detailed information was gathered about the most frequent forest-associated leisure activities. Offsite and onsite attributes of the area visited refer to the location where that activity was most recently pursued. Rated preferences for recreation opportunities (based on ROS qualitative descriptions) were used to categorize the spectrum of recreation users. Preferences were based on places where respondents would like to go to pursue their most frequent leisure activity. Comparisons were made between preferences and the areas visited.

The universe consisted of individuals listed in Alabama telephone directories. A total of 2,700 names and addresses were selected at random by county from the latest available telephone directories in proportion to the number of households in each county. Mail was addressed to persons listed in phone directories; respondents were assumed to be heads of households. No attempt was made to sample households without telephones or those with unpublished numbers. The range of responses for leisure activity participation in forested areas by sampled households, coupled with sociodemographic information, was assumed to be similar to households not surveyed. To reduce seasonal bias, 900 names and addresses were selected and survey forms were mailed at three separate times: April 4, 1983; September 6, 1983; and January 2, 1984.

To help assure a large response, a $1 remuneration was included with the initial mailing. Half of the households also received a recent Alabama highway map. Postcard reminders were sent after one week; nonrespondents were mailed a second form after 2 weeks. Where possible, phone calls were made to households if mail was returned "undeliverable as addressed," or if a response was not received after 3 weeks. Individuals were interviewed by phone if forms were returned blank, or if a response was not received after 4 weeks. Attempts to contact nonrespondents were terminated at the end of 5 weeks.

Of the 2,700 households selected, 155 (6 percent) could not be reached by mail or by telephone. A total of 2,181 completed responses was received, representing a return rate of 86 percent out of 2,545 reached (81 percent of 2,700 selected). Due to greater efficiency in contacting potential nonrespondents and selection of households from more recently updated telephone directory listings during the course of the study, response rate improved with each new phase of the survey:

Date of survey	Number selected	Percent completed	Number completed	No answer	Unable to reach
April 4, 1983	900	74	664	174	62
September 6, 1983	900	82	738	101	61
January 2, 1984	900	87	779	89	32
Total	2,700	81	2,181	364	155

Considerable effort was made to obtain responses from all households selected. Nevertheless, there were 519 nonresponses. The potential bias of this outcome was examined with the assumption that responses from those slow to respond—i.e. respondents whose completed forms were received after the first 20 days of each survey phase—represented the views of nonrespondents. Differences in demographics by time of response suggested that nonrespondents were generally nonusers of forested areas (Appendix A).

All respondents were asked about their recent participation in outdoor leisure activities in or near forested areas, their willingness to pay or volunteer time to support related facilities, and their socioeco-

nomic status. Half[1] of the questionnaires contained questions about the most frequent forest-related leisure activity, the most recent location where that activity was pursued, and ROS preferences. An analysis of responses from those who did not complete the section on ROS preferences is presented in Appendix B.

Many respondents reported "fishing" as their most frequent forest-related leisure activity in the first two phases. To increase sample size among other activities, information about respondents' most frequent forest-related activity other than fishing was sought in the third phase. Appendix C contains a copy of the questionnaire.

The analyses consist of cross-tabulation of variables and comparison of selected categories. Chi-square tests of significant differences were performed to test the hypothesis of no association among categories at the 0.05 probability level. Where the hypothesis of no association was rejected, the contingency coefficient with Sakota's modification for table dimensions (Liebetrau 1983) was used to indicate the degree of association. Values of the modified contingency coefficient, mcc, range between 0 (no association) and 1 (perfect association).

Averages have been calculated for selected variables with numerical values (e.g. miles from residence). Where possible, statistical significance of differences was obtained by comparing averages + or −2 standard errors. Cluster analysis (FASTCLUS, Statistical Analysis System 1982) was used to assess the pattern in the rating of ROS preferences.

RESULTS AND DISCUSSION

Forest Users and Nonusers

Demographic information about forest users and nonusers is presented in table 1. Differences between forest use by urban or rural county of residence are not significant ($P(X^2)<.75$). All other differences are significant ($P(X^2)<.01$). The degree of the association is greatest between forest use and age class (mcc=.492).

Most respondents (1,755 or 80 percent) participate in one or more outdoor leisure activities in or near forested areas. The typical forest users are members of a three-person household with a median 1982 gross family income between $20,000 and $29,999 and subscribe to at least one magazine containing outdoor leisure articles. Forest users are usually males (69 percent), in their 40's, have completed 13 years of schooling, and are employed in skilled or semi-skilled positions. Fishing, sightseeing, and picnicking are commonly listed as their most frequent leisure activity associated with forested areas.

Nonusers (426 or 20 percent of the respondents) are typically members of a two-person household with a median 1982 gross family income under $10,000, and do not subscribe to magazines containing outdoor leisure articles. Nonusers are predominantly females (58 percent), in their 60's, have completed 11 years of schooling, and are retired. Watching television and reading are commonly listed as their most frequent leisure activity.

Both forest users and nonusers consider the quality and variety of outdoor recreation facilities in or near forested areas to be good. Support for outdoor leisure facilities in or near forested areas among respondents is common (80 percent). Those indicating support are, on average, willing to spend $33 and willing to volunteer 15 hours per year. More forest users indicate support (82 percent) than nonusers (40 percent). Other differences between forest users and nonusers are not significant (table 2).

Studies that specifically address forest users vs nonusers in the United States are not known. In Sweden, underrepresentation of forest users among older age groups has been noted (Kardell 1985). Underrepresentation of older age groups, females, those with fewer years of education, and lower household income have been noted elsewhere for Alabama residents in a study of fish and wildlife-associated recreation (U.S. Fish and Wildlife Service and U.S. Bureau of the Census (USFWS/BC) 1980). The current study suggests these findings apply as well to recreation use in or near forested areas.

Nonusers of forested areas are more likely to be older. Many nonusers are also retired, are in one or two person households, have less education and household income, and less are willing than forest users to support outdoor facilities in forested areas. Assessments of the recreation use and potential of forested areas should take into account the sociodemographics of the nearby user population. One can conclude that population shifts affect forest use. A shift toward older ages, retirement, and smaller households—related to unmeasured variables (e.g., declining health)—will result in a decline in forest use. A rise in income, professional occupations, or education levels—related to increases in money or time for recreational pursuits—could reduce or reverse this decline.

Leisure Activities

Half of all respondents participate in fishing, sightseeing, and picnicking in or near forested areas. Hunting, boating, and observing nature in or near forested areas are each listed by a third of the respondents. Camping, gathering and collecting activities, and staying overnight at a resort lodge or cabin

[1]The other half included a map of the State and respondents were asked to indicate the county and number of times they recreated in a particular county. Preliminary analyses suggest most respondents traveled to counties adjacent to their county of residence.

Table 1.—*Percent response by demographic characteristics, forest users, and nonusers*[a]

Characteristic	mcc[c]	Respondents	Forest users	Nonusers
Age class	.492	(n=2,160)	(n=1,746)	(n=414)
16–19		2	2	1
20–24		5	6	0
25–29		9	10	5
30–34		10	12	5
35–39		12	14	5
40–49		16	18	6
50–59		16	15	17
60–69		14	13	21
70 or over		16	10	40
Average age		48.4	45.6	60.2
Sex	.308	(n=2,140)	(n=1,723)	(n=417)
Female		36	31	58
Male		64	69	42
Education (years completed)	.361	(n=2,099)	(n=1,720)	(n=379)
less than 6		3	2	7
6, 7, 8		9	7	20
9, 10, 11		14	13	19
12		30	31	27
13, 14		18	19	12
15, 16		16	17	10
17 or more		11	12	5
Average years		12.6	13.0	10.9
Number in household	.342	(n=2,093)	(n=1,714)	(n=379)
1		18	14	35
2		31	30	37
3		20	22	10
4		19	21	10
5		8	9	5
6 or more		4	4	3
Average		2.8	2.9	2.2
Urban/rural residence	[b]	(n=2,181)	(n=1,755)	(n=426)
SMSA county		65	65	66
Not in SMSA county		35	35	34
Occupation	.416	(n=2,142)	(n=1,735)	(n=407)
Professional/technical/ managerial		26	30	12
Factory/service worker		12	13	9
Craftperson/mechanic		9	10	3
Salesperson/buyer		5	5	2
Student		4	5	2
Clerical/secretarial		4	4	3
Farmer		2	2	1
Laborer		1	1	1
Homemaker		8	7	10
Retired		28	22	53
Disabled or unemployed		2	2	3
Household income (before taxes, 1982)	.451	(n=1,900)	(n=1,569)	(n=331)
Under $10,000		26	20	58
10,000–19,999		25	26	20
20,000–29,999		21	23	10
30,000–39,999		13	15	6
40,000–49,999		7	8	2
50,000–59,999		3	4	1
60,000 or over		4	4	2
Average		$22,700	$24,600	$13,800

Table 1.—*Percent response by demographic characteristics, forest users, and nonusers*[a]*—Continued*

Characteristic	$\overline{m}cc$[c]	Respondents	Forest users	Nonusers
Number of outdoor leisure magazine subscriptions	.330	(n=2,038)	(n=1,660)	(n=378)
None		54	48	78
1		26	29	16
2		11	12	4
3		5	6	1
4 or more		3	4	1
Average		0.8	0.9	0.3

[a]Columns may not sum to 100 due to rounding; n=sample size. $P(X^2) < .010$ except where noted.
[b]$P(X^2) < .750$, SMSA = Standard Metropolitan Statistical Area, U.S. Census 1980.
[c]mcc = modified contingency coefficient. Values range from 1 (perfect association) to 0 (no association).

Table 2.—*Average value of the quality, variety, and willingness to support (develop, improve, or maintain) outdoor leisure facilities associated with forested areas for forest users and nonusers*

Opinion	All	Forest users	Nonusers
Quality[a] (−,+2SE)	2.20(2.16, 2.24)	2.19(2.15, 2.23)	2.31(2.11, 2.51)
(sample size)	(1613)	(1496)	(117)
Variety[a] (−, +2SE)	2.43(2.38, 2.48)	2.43(2.38, 2.48)	2.56(2.33, 2.76)
(sample size)	(1502)	(1397)	(105)
Percent[b] willing to support	80	82	40
(sample size)	(1272)	(1200)	(72)
Amount[c] (−, +2SE)	33(30, 36)	33(30, 36)	24(17, 34)
Time[c] (−, +2SE)	15(13, 17)	15(13, 18)	9(4, 21)
(sample size)	(1013)	(984)	(29)

[a]Scale: 1=excellent, 2=good, 3=fair, 4=poor, 5=absent. SE = standard error of the estimate.
[b]$P(X^2) < .000$, mcc = .338
[c]Average only of those indicating support. Log transformations used in computations.

associated with forested areas are common among one-fourth of the respondents. Further details by specific activity are listed in table 3.

One-third of the forest users list fishing as their most frequent leisure activity. Other more traditional forest-related activities, such as hunting and camping, are less frequently listed. Forest users' most frequent leisure activities other than fishing are hunting and sightseeing (table 4).

That water-based activities, primarily fishing, are among the most common recreation activities as well as the most frequent leisure activities associated with forested areas is surprising. Dispersed land-based activities, such as hunting, traditionally are the recreation activities closely associated with forested areas. However, few people hunt; more are involved in fishing (USFWS/BC 1980). Less than 5 percent of Alabama's forests are within 100 yards of permanent water sources (Rudis and others 1984). Apparently the few forested areas near water bodies receive attention from the majority of forest recreation users.

ROS Scores

Forest user preferences for urban to primitive recreation opportunities were derived from respondents' rating of 5 primitive and 6 urban-oriented descriptions. Each description was rated by respondents with a 5-level scale of importance. Answers were assigned values from 1, extremely important, to 5, not at all important. A total preference score was computed only for respondents who rated all descriptions listed. Scores ranged from −19 (−5 for each primitive setting, +1 for each urban setting) to +25 (−1 for each primitive setting, +5 for each urban setting). Scores were grouped into one of five ordered categories, each comprising 20 percent of the responses. Figure 1 illustrates the frequency of scores along the recreation opportunity spectrum, and the divisions made to group individuals into categories.

The scores and categories arrange individual preferences along an established spectrum. Cluster analysis of rated opportunities helps one to understand the

Table 3.—*Percent participation in outdoor leisure activities in or near forested areas (all respondents, sample size=2, 181)*

Activity	Group activity	Individual activity
Fishing	56	
Sightseeing	52	
Picnicking	48	
Hunting	35	
Small game		31
Big game		23
Waterfowl		10
Boating	34	
Motorized		29
Nonmotorized		14
Observing nature	30	
Watching birds, other wildlife, or plants		26
Nature study or photography		14
Camping	28	
Developed, motorized access		25
Backcountry, nonmotorized access		9
Gathering and collecting activities	28	
Staying overnight at a resort lodge or cabin	23	
Other	3	

Table 4.—*Percent Alabama forest users by most frequent outdoor leisure activity in or near forested areas*[a]

Activity	All respondents	All activities April 1983 and September 1983	Except for fishing January 1984[b]
	(n = 856)	(n = 567)	(n = 279)
Fishing	23	32	.....
Sightseeing	19	16	25
Hunting	18	13	29
Camping	10	9	13
Picnicking	9	8	10
Boating	7	6	9
Observing nature	6	7	6
Gathering and collecting	2	2	3
Miscellaneous	8	7	9

[a]Columns may not sum to 100 due to rounding; n=sample size.
[b]An additional 10 respondents indicated that fishing was their only activity associated with forested areas.

spectrum by pulling out underlying "clusters" of individuals with similar answers. Five clusters have been chosen for comparison with the five ROS categories. Suggested behavior is identified on the basis of similar rating (table 5). These response clusters are described below:

Behavior: Rated preferences of recreation opportunities

(1) *Convenience and direction:* "Very much" important is a well-marked area with signs directing users to facilities and activities, having supervision and protection, and where motorized travel is permitted, "Not at all" important is an area where motorized use is not permitted or an area with no evidence of human use.

(2) *Freedom, but with convenience and direction:* "Very much" important is an area free from human restrictions or controls, a well-marked area with signs directing users to facilities and activities, having supervision and protection, and where motorized travel is permitted.

(3) *Indeterminate:* An area where motorized travel

is "somewhat" important and each of the other opportunities is "a little" important. No clear preferences are discernible.

(4) *Isolation, but with some direction:* "Very much" important is an area far from the sights and sounds of others, a large natural area far from human settlements, a well-marked area with signs directing users to facilities and activities, and having supervision and protection.

(5) *Isolation:* "Very much" important is an area with no evidence of human use, being far from the sights and sounds of others, an area where motorized travel is not permitted, a large natural area far from human settlements, and an area free from human restrictions or controls.

It is likely that the range of scores represents one dimension of an array of behaviors. Table 6 lists the

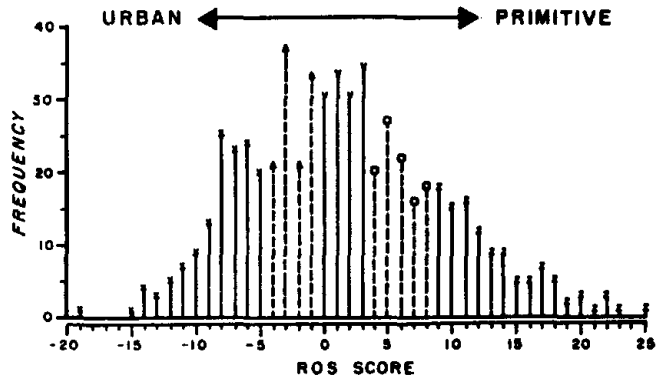

Figure 1.—*Number of responses (frequency) by Recreation Opportunity Spectrum scores. Each symbol marks a category representing 20 percent of responses.*

Table 5.—*Average importance[a] of preferred recreation opportunites by primitive and urban descriptions and response clusters, Alabama forest users*

Recreation opportunity		Response cluster 1	2	3	4	5
(sample size)	(589)	(179)	(100)	(101)	(117)	(92)
Primitive						
Area with no evidence of human use		4.72	3.31	4.31	3.31	1.95
Being far from the sights and sounds of others		3.98	2.83	3.60	2.40	1.60
Area where motorized travel is not permitted		4.63	3.44	4.29	3.13	2.32
Large natural area far from human settlements		3.71	2.66	3.65	2.18	2.11
Area free from human restrictions or controls		4.42	2.14	3.73	4.24	2.19
Urban						
Well-marked area, signs directing users		1.83	1.84	3.58	2.11	3.83
Area where motorized travel is permitted		1.99	2.14	3.30	2.95	3.74
Supervision and protection		1.96	1.83	3.94	2.11	3.80
Small natural area near human settlements		3.14	2.62	3.79	3.54	3.73
Mixing with others engaged in similar activities		3.10	2.63	4.12	3.68	4.25
Being near the sights and sounds of others		3.00	2.90	4.05	4.19	4.42

[a]Scale: 1=extremely, 2=very much, 3=somewhat, 4=a little, 5=not at all.

Table 6.—*Percent response[a] by ROS scores and response clusters, Alabama forest users (n=589)*

Response cluster (#) cluster	ROS score: Urban −19 to −5	−4 to −1	0 to 3	4 to 8	Primitive 9 to 25
(1) Convenience and direction	91	46	4	.....	.....
(2) Freedom/convenience and direction	8	29	33	15	.....
(3) Indeterminate	1	12	31	38	8
(4) Direction/isolation	.....	14	32	41	16
(5) Isolation	.....	.....	....	7	76
(Sample size)	(135)	(112)	(127)	(103)	(112)

[a]Columns may not sum to 100 due to rounding.

proportion of suggested behavior types associated with the categories grouped in this study.

Not surprisingly, the clusters in table 6 loosely correspond with categories described in the ROS Users Guide (U.S. Forest Service 1982): 1-urban, 2-rural, 3-semi-primitive motorized or roaded natural, 4-semi-primitive nonmotorized, 5-primitive. The principal distinction for both the clusters and ROS categories is between users interested in convenience and direction (urban-oriented) and those interested in isolation (primitive-oriented).

Average ROS scores vary with the activity; picnicking is at the urban end of the spectrum and hunting at the primitive end. While differences among some activities are not significant (e.g. among picnicking, camping, fishing, sightseeing, and boating), significant differences are apparent for other activities (e.g., between picnicking and hunting, picnicking and other activities, hunting and sightseeing) (fig. 2). Response frequency for a particular activity varies with ROS category (table 7). Each ROS category contains several respondents from every activity, however.

The relationship between ROS scores and activities is appealing intuitively; hunting more frequently occurs in isolation from people than does picnicking or camping. Management and activity constraints aside, the designation of an area as having a primitive recreation opportunity means that hunting activity is more likely to occur there than camping or picnicking. Regional classification, monitoring, and analyses should bear in mind that isolated areas, although relatively scarce, will be used frequently for only a few activities.

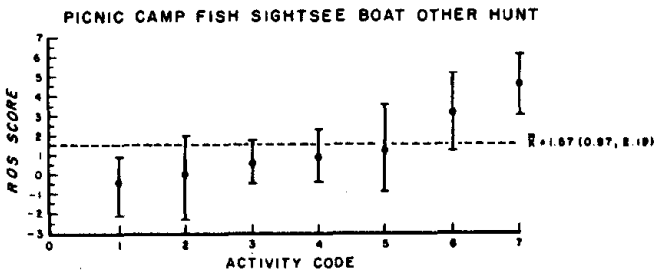

Figure 2.—*Average Recreation Opportunity Spectrum Score (−, +2 standard errors) by most frequent activity (sample size=589, $\bar{\bar{x}}$ = overall mean).*

ROS Categories and Demographics

Significant differences exist among ROS categories when classed by age, sex, and education. Individuals with urban-oriented preferences are generally older and have completed fewer years of schooling than those with primitive-oriented preferences. While the majority of respondents are males, more of the urban-oriented are females (36 percent) than are the primitive-oriented (21 percent females). In other respects, no significant differences exist among ROS categories by income, occupation, number of persons per household, urban/rural county residence, and magazine subscriptions (table 8). As stated earlier, most forest users consider the quality and variety of facilities to be good (table 9). Differences are not significant in the proportion willing to support, or in the level of support of outdoor leisure activities (table 9, fig. 3).[2]

Other studies have shown that young adults, males, and those with some college education form the majority of users in wilderness—i.e., primitive—settings (Boteler 1986). Results in this study regarding preferences are consistent. Primitive recreation opportuni-

[2]Note, however, the limitations of the questionnaire and sample design. The survey was aimed at heads of households and ROS preferences of their most frequent leisure activity; the person who filled out the questionnaire could have been another individual. Variability within ROS categories could be different if all individuals in a household are sampled.

Table 7.—*Percent response[a] by ROS scores and most frequent leisure activity, Alabama forest users ($P(X^2) < .000$, mcc = .176)*

Activity	Sample size	All	ROS score: Urban −19 to −5	−4 to −1	0 to 3	4 to 8	Primitive 9 to 25
Picnicking	52	9 (100)	9 (23)	12 (25)	13 (33)	6 (12)	4 (18)
Camping	65	11 (100)	21 (43)	8 (14)	7 (14)	8 (12)	10 (17)
Fishing	130	22 (100)	22 (23)	23 (20)	29 (28)	17 (13)	18 (15)
Sightseeing	115	20 (100)	21 (24)	21 (20)	22 (24)	18 (17)	15 (15)
Boating	58	10 (100)	10 (24)	12 (22)	7 (16)	10 (17)	11 (21)
Other[b]	67	11 (100)	7 (13)	13 (21)	9 (18)	14 (21)	16 (27)
Hunting	102	17 (100)	10 (14)	13 (14)	12 (15)	28 (28)	27 (29)
Column total (Row total)	589	100 (100)	100 (23)	100 (19)	100 (22)	100 (17)	100 (19)

[a]Rows and columns may not sum to totals due to rounding.

[b]Observing nature, gathering and collecting, and miscellaneous activities, including no one most frequent activity.

Table 8.—*Percent response*[a] *by demographic characteristics and ROS score*

Characteristic	Statistics	All	ROS score: Urban −19 to −5	← −4 to −1	0 to 3	4 to 8 →	Primitive 9 to 25
Age class	$P(X^2) < .000$	(n=587)	(n=135)	(n=111)	(n=126)	(n=103)	(n=112)
16–24	mcc = .344	9	4	5	11	8	18
25–29		13	8	8	11	16	21
30–34		13	13	11	14	9	16
35–39		16	15	20	17	16	14
40–49		21	18	27	21	23	15
50–59		14	19	12	13	14	13
60–69		10	14	13	8	12	3
70 or over		5	10	5	6	4	0
Average age		42.2	46.9	44.0	41.4	42.5	35.1
Sex	$P(X^2) < .025$	(n=579)	(n=135)	(n=109)	(n=123)	(n=102)	(n=110)
Female	mcc = .194	29	36	36	24	28	21
Male		71	64	64	76	72	79
Education (years completed)	$P(X^2) < .017$ mcc = .268	(n=581)	(n=135)	(n=108)	(n=125)	(n=102)	(n=111)
8 or less		6	7	6	8	4	3
9, 10, 11		11	19	7	14	6	5
12		29	29	37	28	28	25
13, 14		21	19	22	18	17	27
15, 16		19	16	14	18	27	21
17 or more		14	10	14	13	18	19
Average years		13.5	12.9	13.3	13.1	14.2	14.2
Number in household	$P(X^2) < .616$	(n=582)	(n=134)	(n=108)	(n=125)	(n=103)	(n=112)
1		12	13	7	12	11	14
2		27	31	25	25	31	22
3		21	21	19	26	17	23
4		24	22	31	20	23	27
5 or more		16	13	17	17	18	13
Average		3.1	3.0	3.4	3.1	3.2	3.1
Urban/rural residence	$P(X^2) < .895$	(n=589)	(n=135)	(n=112)	(n=127)	(n=103)	(n=112)
SMSA[b] county		66	67	68	65	68	63
Not in SMSA county		34	33	32	35	32	38
Occupation	$P(X^2) < .102$	(n=585)	(n=135)	(n=111)	(n=126)	(n=102)	(n=111)
Professional/technical/ managerial		33	32	28	31	32	41
Factory/service worker		14	13	12	17	10	14
Craftsperson/mechanic		11	10	13	11	11	9
Salesperson/clerical		10	11	9	9	11	9
Student		7	2	7	7	5	14
Homemaker		8	10	10	6	9	4
Retired		16	21	16	17	18	6
Other		3	1	5	2	5	4
Household income (before taxes, 1982)	$P(X^2) < .687$	(n=542)	(n=127)	(n=99)	(n=117)	(n=94)	(n=105)
Under $10,000		14	13	15	18	13	9
10,000–19,999		27	26	28	29	22	27
20,000–29,999		25	26	15	27	27	28
30,000–39,999		18	20	18	15	17	18
40,000–49,999		7	6	10	3	7	9
50,000–59,999		5	5	6	4	5	4
60,000 or over		6	4	7	3	9	7
Average		$26,800	$26,200	$28,200	$23,400	$28,600	$28,300

Table 8.—*Percent response*[a] *by demographic characteristics and ROS score—Continued*

Characteristic	Statistics	All	ROS score: Urban −19 to −5	−4 to −1	0 to 3	4 to 8	Primitive 9 to 25
Number of outdoor leisure magazine subscriptions	$P(X^2) < .136$	(n=570)	(n=127)	(n=109)	(n=125)	(n=99)	(n=110)
None		44	45	41	54	36	42
1		28	34	26	20	33	28
2		15	10	15	18	16	15
3		13	11	18	9	14	15
Average		1.0	0.9	1.2	0.9	1.2	1.1

[a]Columns within each characteristic may not sum to 100 due to rounding.
[b]SMSA = Standard Metropolitan Statistical Area, U.S. Census 1980.

Table 9.—*Average value (±2 standard errors) of the quality, variety, and willingness to support (develop, improve, or maintain) outdoor leisure facilities associated with forested areas by ROS score*

Opinion	All	ROS score: Urban −19 to −5	−4 to −1	0 to 3	4 to 8	Primitive 9 to 25
Quality[a]	2.3 ± .1	2.1 ± .2	2.3 ± .2	2.1 ± .2	2.4 ± .2	2.4 ± .2
(Sample size)	(548)	(123)	(99)	(121)	(97)	(108)
Variety[a]	2.6 ± .1	2.4 ± .2	2.5 ± .2	2.4 ± .2	2.7 ± .2	2.7 ± .2
(Sample size)	(539)	(122)	(100)	(114)	(97)	(106)
Percent willing to support[b]	86	84	86	84	87	89
(Sample size)	(488)	(106)	(87)	(109)	(83)	(103)

[a]Scale: 1=excellent, 2=good, 3=fair, 4=poor, 5=absent
[b]$P(X^2) < .811$

ties are preferred by a plurality of younger individuals, males, and those with more schooling; urban recreation opportunities are preferred by a plurality of older individuals, females, and those with fewer years of schooling.

The degree of recreation activity specialization is correlated with age (Jackson and Peyton 1986). Individuals less experienced and specialized in a particular activity—generally younger individuals—are goal-oriented (e.g., the trophy buck, the highest mountain peak) (Jackson and Peyton 1986). The solitude and survival experience of primitive recreational opportunities may be more suited to their desires. Those more experienced and specialized in an activity—generally older individuals—are interested in companionship and in the participation experience. With reduced physical abilities at advanced ages, older, more experienced individuals may be more interested in the convenience and direction of urban opportunities.

ROS Categories and Forest Attributes

Findings reported here reflect a typical outing to pursue one's most frequent leisure activity. Ideas for classifying forest areas used by a spectrum of user types are explored as alternatives to the ROS standards (U.S. Forest Service 1982) that may not apply in Alabama. Areas where less frequent leisure activities are pursued, or where preferred opportunities exist may be much farther away and more difficult to reach. Ownership, distance from nonforest land uses, and onsite forest attributes may be different as well.

Distance from Residence.—Users travel about 20 miles from their residence, or slightly less than 1 hour away, and at an average speed of 26 miles per hour (fig. 4). The majority of users travel mostly by car (60 percent) (table 10), and consider the area very easy to reach (62 percent) (table 11).

Primitive-oriented users (ROS score 9 or greater) travel an average of 12 miles from their residence and

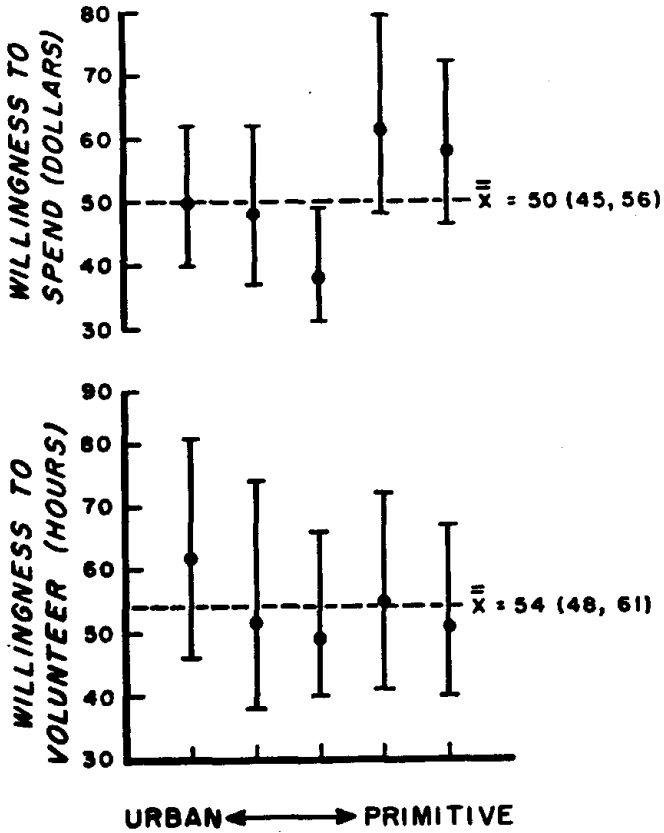

Figure 3.—*Average willingness to support outdoor leisure facilities associated with forested areas among supporters (−, +2 standard errors) by ROS category (sample size=488).*

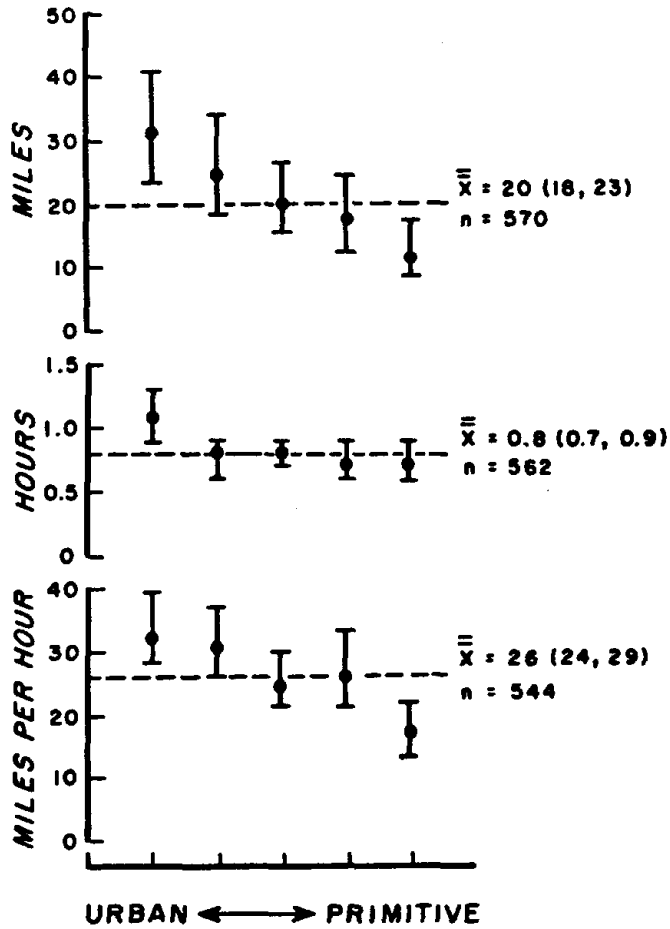

Figure 4.—*Average distance traveled from residence in miles, hours, and miles per hour (−, +2 standard errors) by ROS category. (n=sample size).*

Table 10.—*Percent response[a] by major mode of transportation and ROS score ($P(X^2)<.000$, mcc=.284)*

		ROS score				
Mode of transportation	All	Urban −19 to −5	◄ −4 to −1	0 to 3	4 to 8 ►	Primitive 9 to 25
	(n=579)	(n=132)	(n=109)	(n=127)	(n=102)	(n=109)
Auto	60	70	61	60	58	48
Truck, van or motor home	25	22	28	28	20	28
On foot	6	2	1	3	14	13
Other[b]	9	6	9	9	8	12

[a]Columns may not sum to 100 due to rounding.
[b]Includes motorcycle, train or bus, boat, airplane, bicycle, and no major mode indicated.

Table 11.—*Percent response[a] by ease of travel and ROS score ($P(X^2)<.026$, mcc=.209)*

		ROS score				
Ease of travel	All	Urban −19 to −5	◄ −4 to −1	0 to 3	4 to 8 ►	Primitive 9 to 25
	(n=580)	(n=134)	(n=106)	(n=127)	(n=103)	(n=110)
Difficult or somewhat difficult	8	3	4	13	9	11
Somewhat easy	31	26	34	31	29	34
Very easy	62	71	62	56	62	55

[a]Columns may not sum to 100 due to rounding.

take more time to reach their destination (17 miles per hour) than urban-oriented users (ROS score −5 or less), with 31 miles and 33 miles per hour, respectively (fig. 4). One plausible hypothesis is that urban-oriented users place greater importance on being physically distant from one's residence to achieve the sense of "getting away from it all" or "timelessness" (Tuan, 1977:122) desired by vacationers. Primitive-oriented users may place greater importance on being temporally distant—i.e., using slower modes of transportation (table 10) and somewhat more difficult travel routes (table 11)—or may place greater importance on other attributes to achieve the sense of "getting away from it all."

Ownership.—Forested areas in public ownership are not used as much by primitive-oriented users (36 percent) as by urban-oriented users (52 percent) (table 12). In Alabama, only 5 percent of the forests are publicly owned (Rudis and others 1984); only 10 percent of all Midsouth forests (Alabama, Arkansas, Louisiana, Mississippi, Tennessee, east Oklahoma, and east Texas) are publicly owned (Rudis 1986). With public forests one is more likely to encounter the directions and conveniences desired by individuals at the urban-end of the spectrum—signs directing users, adjacent resort development, etc.—than forests in private ownership.

On private land, 43 percent of forest users pursue leisure activities on land owned by themselves, friends, or relatives; 27 percent use land owned by someone else, and 29 percent do not know the owner. Differences by ROS categories are not significant (table 13).

Distance from Nonforest Land Uses.—Respondents indicate that the majority of use occurs near roads (59 percent within 1/4 mile of roads), near water bodies (58 percent within 100 yards of water bodies), far from farms (53 percent 1/2 mile or more from farms), and quite far from urban areas (51 percent 3 miles or more from urban or built-up land) (table 14).

Roads.—The median distance from roads for primitive-oriented users is 1/2 mile, while for others the distance is shorter. If midpoints are used to compute average values, separation of other categories from the "most primitive" is achieved at 3/4 mile (fig. 5a). (Note that "3 miles or more" = 3.5 miles, and "don't know" = no answer.)

This distance is considerably shorter than that suggested in ROS studies in the western United States. There are several reasons for this. Other studies (Brown and others 1978; Lee and others 1983) use the

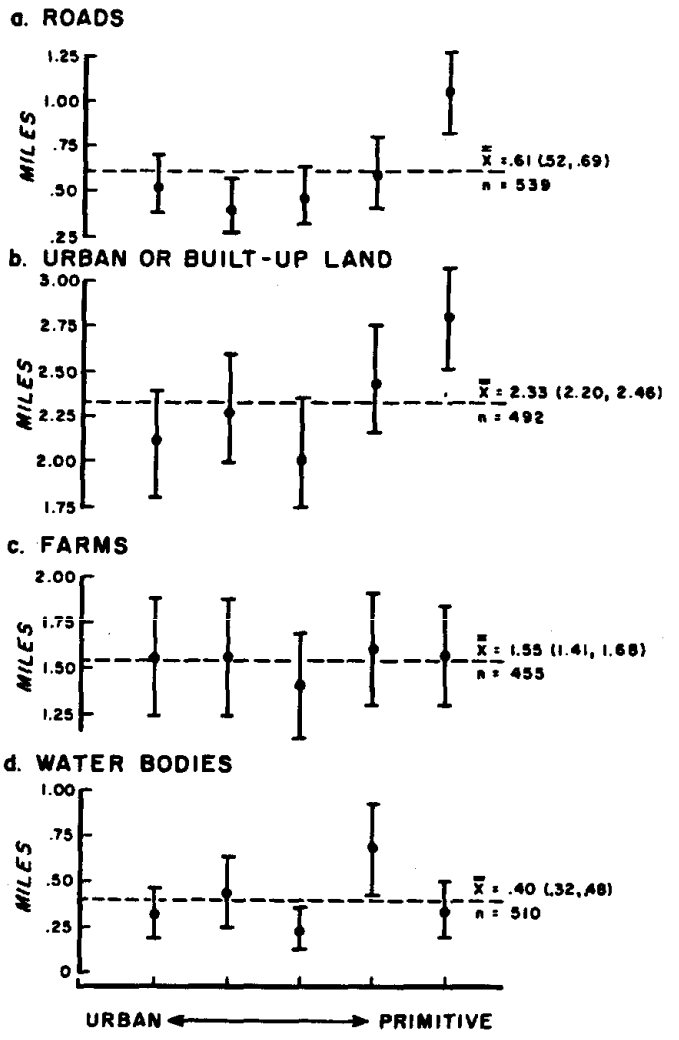

Figure 5.—*Average distance from nonforest land uses (−, +2 standard errors) by ROS category (n = sample size).*

Table 12.—*Percent response*[a] *by ownership of most recent site visited and ROS score ($P(X^2) < .001$, mcc = .266)*

Ownership	All	ROS score: Urban −19 to −5	−4 to −1	0 to 3	4 to 8	Primitive 9 to 25
	(n=578)	(n=133)	(n=109)	(n=125)	(n=102)	(n=109)
Public agency	48	52	54	59	36	36
Farmer	11	7	8	9	14	19
Other private	28	29	23	18	36	34
Don't know	13	13	15	14	14	11

[a]Columns may not sum to 100 due to rounding.

distance identified by planners or recreation users at on near a selected site. The distance in this study represents an average of the maximum distance traveled and reported by users for a site recently visited. The preferred distance for any given site could very well be different.

Another reason is that vegetative screening and landscape conditions in Alabama are unlike those in the West. Brown and others (1978) suggested three miles as a minimum road distance standard to obtain a primitive recreation experience for backcountry areas in Colorado. This suggestion has also been incorporated into the ROS Users Guide (U.S. Forest Service 1982). In Oregon, Lee and others (1983) recommended 2 miles for semi-arid and sparsely vegetated mountain areas. The more densely vegetated

Table 13.—*Percent response[a] by type of association with private owner of most recent site visited and ROS score ($P(X^2)<.127$)*

		ROS score				
		Urban ←			→	Primitive
Private owner association	All	−19 to −5	−4 to −1	0 to 3	4 to 8	9 to 25
	(n=296)	(n=66)	(n=49)	(n=52)	(n=63)	(n=66)
Self, friend or relative	43	38	31	42	49	53
Someone else	27	27	35	19	27	29
Don't know	29	35	35	38	24	18

[a]Columns may not sum to 100 due to rounding.

Table 14.—*Percent response[a] by distance from nonforest land uses and ROS score*

			ROS score				
			Urban ←			→	Primitive
Nonforest land use/distance	Statistics	All	−19 to −5	−4 to −1	0 to 3	4 to 8	9 to 25
Roads	$P(X^2)<.005$	(n=566)	(n=128)	(n=106)	(n=124)	(n=99)	(n=109)
100 feet	mcc=.306	24	33	22	29	22	11
100 yards		19	19	25	19	17	14
1/4 mile		16	13	17	19	18	17
1/2 mile		14	13	16	11	16	17
1 or 2 miles		16	14	11	12	14	27
3 miles or more		6	5	3	4	6	13
Don't know		5	3	6	6	6	3
Farms	$P(X^2)<.009$	(n=569)	(n=128)	(n=108)	(n=123)	(n=101)	(n=109)
100 feet	mcc=.297	8	9	4	11	8	9
100 yards		8	6	11	8	8	8
1/4 mile		11	11	13	7	9	13
1/2 mile		11	9	10	11	15	10
1 or 2 miles		17	9	15	18	19	25
3 miles or more		25	24	26	20	29	28
Don't know		20	32	21	24	13	7
Urban or built-up land	$P(X^2)<.008$	(n=560)	(n=125)	(n=104)	(n=121)	(n=100)	(n=110)
100 feet or 100 yards	mcc=.283	8	11	8	11	7	3
1/4 mile		9	7	5	13	11	6
1/2 mile		7	11	9	8	3	5
1 or 2 miles		13	12	18	10	13	13
3 miles or more		51	43	45	44	56	67
Don't know		12	15	15	14	10	5
Water bodies	$P(X^2)<.368$	(n=545)	(n=126)	(n=100)	(n=115)	(n=97)	(n=107)
100 feet		42	46	39	47	38	40
100 yards		16	15	21	17	11	15
1/4 mile		14	13	12	13	12	21
1/2 mile		9	10	8	7	10	11
1 or 2 miles		6	6	6	6	7	6
3 miles or more		6	4	7	2	12	5
Don't know		6	6	7	8	8	3

[a]Columns may not sum to 100 due to rounding.

and comparatively level topography characteristic of Alabama's forests (Rudis 1983) is more likely to require a shorter distance to achieve a sense of isolation from the sights and sounds of man.

Recreation site selection is a complex process based not only on user preferences but on familiarity and importance of activities desired, knowledge or skill held by the user, and available opportunities (McCool and others 1985). User familiarity may provide an additional reason for finding a shorter distance from roads in the current study. For Alabama forest users, personal knowledge of pristine environments and the range of available opportunities that provide primitive recreational experiences may be more limited than that for recreation users in Colorado (Brown and others 1978) or Oregon (Lee and others 1983). In the Midsouth, 0.6 percent of the forests are 3 miles or more from roads (Rudis 1986). Less than 10 percent of Alabama's forested land is 1/2 mile or more from roads; less than 4 percent is 1 mile or more from roads (Rudis and others 1984).

Farms.—The median distance from farms is 1 or 2 miles for all forest users, regardless of preferences. More of the urban-oriented users are unaware of the location of farms, compared with primitive-oriented users. Without the "don't know" response, a plot of average distances suggests no significant differences by ROS categories (fig. 5c).

Urban or Built-Up Land.—The median distance from urban or built-up land is 3 miles for users at the primitive-end of the spectrum and 1 or 2 miles for users at the urban-end of the spectrum. With computation of midpoints, distinguishing several of the ROS categories is relatively weak. Separation of the extremes is achieved at 2.5 miles (fig. 5b).

Forests distant from urban or built-up land are used more by primitive-oriented users than urban-oriented users. The ROS Users Guide (U.S. Forest Service 1982) does not distinguish primitive opportunities on the basis of a distance from urban or built-up land. The amount, distribution, and degree of evidence of man-made structures are important ROS criteria, however. A fixed distance from urban and built-up land can provide a more simplified, logical basis for distinguishing primitive use areas for sample-based inventories in the South.

Water.—Most forest users visit sites within a short distance of water; 81 percent visit sites within 1/2 mile of water bodies. Water is a focal point of outdoor recreation activities in general (Cordell and Hendee 1982), so one should not be surprised that activities in or near forested areas are also associated with water. Alabama forests near water bodies constitute a small percentage of the total forest land resource, however. Only 11 percent of forests are within 900 feet of water sources 1/8 acre or more in size or 40 feet or more in width (Rudis and others 1984). Differences by ROS categories are not significant (fig. 5d). Apparently the limited forest area near water is used extensively for leisure activities, regardless of preferences.

Size of Nearby Water Body.—Associated with ROS categories is the size of the nearby water body. Thirty-seven percent of the primitive-oriented users are near large rivers, lakes, or coastal areas, compared with 59 percent of urban-oriented users. More of the primitive-oriented users (33 percent) use areas near small streams or creeks, than do urban-oriented users (14 percent) (table 15).

Forests near large water bodies are relatively scarce—less than 5 percent of forested land is within 900 feet of water bodies 1 acre or more in size, or 120 feet or more in width. Such areas require a greater distance to reach but are more likely to have the directions and conveniences desired by urban-oriented users—e.g., resort development, signs directing users, etc.—than forests near smaller water bodies.

Restrictions.—The majority of respondents do not notice any restrictions to public use on the land they use. Most frequently noted are signs (51 percent), followed by fences (47 percent) (table 16). Fences are noticed less frequently by those that score in the middle ROS category (35 percent) than those at the urban-end (51 percent) or primitive-end (67 percent) of the spectrum.

Onsite Forest Attributes.—The majority of users pursue leisure activities inside forests (53 percent), in mixed pine-hardwood stands (52 percent), and in stands greater than 40 acres in size (51 percent). Users predominate in stands with limited vegetative screening (36 percent) and in moderately-aged stands (majority of trees 1/2 shoulder width, 41 percent) (table 17).

More primitive-oriented users (69 percent) seek recreation inside the forest than urban-oriented users do (46 percent). The association between ROS category and forest size and tree diameter is due to the proportion of "don't know" anwers. Perhaps because fewer urban-oriented users pursued activities inside forests, more responded with "don't know" answers regarding forest size and the diameter of trees.

Forest type and vegetative screening are interrelated: more pine stands have limited screening, while more bottomland stands have abundant screening. Of the two attributes, the one most significantly associated with the ROS is vegetative screening (mcc=.339). A plurality of urban-oriented users seek areas in stands with limited vegetative screening (47 percent), while a plurality of primitive-oriented users seek areas in stands with intermediate vegetative screening (43 percent).

The amount of vegetative screening has been shown to affect user selection of campgrounds (Hancock 1973), and in rating scenic quality (Brown and Daniel 1984). Others (Brown and others 1978, U.S. Forest

Table 15.—*Percent response*[a] *by size of water body near most recent site visited and ROS score* ($P(X^2) < .005$, *mcc* = .256)

Size of water body	All	ROS score: Urban −19 to −5	−4 to −1	0 to 3	4 to 8	Primitive 9 to 25
	(n=545)	(n=125)	(n=104)	(n=120)	(n=92)	(n=104)
Stream or creek (100 feet wide or less)	24	14	17	30	27	33
Pond (1 acre or less)	10	13	9	5	8	14
Small river or lake (100 feet - 1/4 mile wide)	17	14	18	20	18	16
Large river, lake, or coastal waters (greater than above)	49	59	56	45	47	37

[a]Columns may not sum to 100 due to rounding.

Table 16.—*Percent response*[a] *by restriction from public use of most recent site visited and ROS score*

Restriction	$P(X^2)$	All	ROS score: Urban −19 to −5	−4 to −1	0 to 3	4 to 8	Primitive 9 to 25
Notice anything?	.337	(n=567)	(n=130)	(n=106)	(n=118)	(n=102)	(n=111)
Yes		35	33	31	34	33	34
No		58	58	58	60	62	53
Don't know		7	9	10	6	5	4
Restriction noticed		(n=198)	(n=43)	(n=33)	(n=40)	(n=34)	(n=48)
Signs	.362	51	63	42	55	47	46
Fences	.002[b]	47	51	24	35	50	67
Posted, no hunting	.052	43	23	52	45	53	46
No trespassing or keep out	.461	33	33	21	30	38	40
Hunt club—members only	.644	25	19	30	25	32	23

[a]Columns may not sum to 100 due to rounding.
[b]mcc = .399.

Service 1982) have postulated that screening can alter the recreation experience. Forests with limited screening, those with a wider field of view, are more convenient to walk through, and are therefore more likely to be used by people with urban-oriented preferences. Forests with more dense vegetation limit the perception of human noise (Mulligan and others 1982) and the visibility of human intrusions. Such forests are more isolated from the sights and sounds of man and are, therefore, more likely to be used by individuals at the primitive-end of the spectrum.

ROS Categories and Other Preferences

Forest users were questioned about other preferences to examine the relative importance of selected conveniences and human intrusions, and to assess the consistency of ROS categories against the desire for conveniences and dislike of human intrusions. Results are as follows:

Conveniences.—More than half of the users prefer to have drinking water available (69 percent) and a map of the trails and roads (51 percent). As expected, the majority of urban-oriented users prefer to have several conveniences: drinking water, flush toilets, electric hook-ups or outlets, a grocery store nearby, and garbage collection; pit toilets, hot water, and organized activities are of lesser importance (table 18). Two-thirds of the primitive-oriented users (64 percent) prefer few or no conveniences. The number of conveniences desired by ROS categories declines with urban-to-primitive orientation of users (fig. 6).

Human Intrusions.—Most of the forest users dislike the presence of old bottles and rusted cans. Other dislikes, in order of importance, are trash or garbage, logging activity, user fees, grazing by livestock, and clearcut areas (table 19). As expected, urban-oriented users are not as negative about their dislikes of

Table 17.—*Percent response*[a] *by onsite forest attributes of most recent site visited and ROS score*

Attribute/subcategory	Statistics	All	ROS score: Urban −19 to −5	−4 to −1	0 to 3	4 to 8	Primitive 9 to 25
Location relative to a forest		(n=558)	(n=127)	(n=103)	(n=123)	(n=97)	(n=108)
	P(X²)<.004						
Outside	mcc=.231	47	54	52	48	48	31
Inside		53	46	48	52	52	69
Vegative screening	P(X²)<.000	(n=582)	(n=133)	(n=111)	(n=126)	(n=101)	(n=111)
Limited	mcc=.339	36	47	42	35	31	22
Intermediate		30	20	22	26	43	43
Abundant		21	16	20	23	16	32
Don't know		13	17	16	16	11	3
Type of forest vegetation	P(X²)<.023	(n=582)	(n=132)	(n=111)	(n=127)	(n=101)	(n=111)
Mostly pines	mcc=.245	17	19	21	15	9	20
Pine/hardwood mix		52	49	50	50	64	45
Mostly hardwoods or upland hardwoods		8	8	5	11	8	7
Bottomland hardwoods		15	11	13	16	14	24
Don't know		8	13	11	8	5	4
Forest size	P(X²)<.000	(n=576)	(n=131)	(n=109)	(n=124)	(n=101)	(n=111)
Less than 10 acres	mcc=.299	11	8	10	13	16	9
10-40 acres		18	18	18	17	20	17
Greater than 40 acres		51	40	50	48	53	68
Don't know		20	34	22	22	11	6
Diameter of majority of trees	P(X²)<.001	(n=580)	(n=133)	(n=111)	(n=125)	(n=101)	(n=110)
Wrist or smaller	mcc=.284	7	6	5	8	7	9
1/2 shoulder width		41	38	38	42	41	47
Shoulder width		25	19	21	23	33	30
Larger or mixed		9	14	13	5	3	10
Don't know		18	23	24	22	17	4

[a]Columns may not sum to 100 due to rounding.

human intrusions. Urban-oriented users are less negative about the presence of trash or garbage, logging activities, and user fees, and somewhat more negative about grazing activity (fig. 7). Dislikes of clearcut areas are inconsistent in direction relative to ROS categories, suggesting the word "clearcut" has connotations that vary with user preferences.

Findings above suggest that the direction of the association between ROS categories and preference for conveniences and dislike of human intrusions are generally consistent with the logic of the standards in the ROS Users Guide (U.S. Forest Service 1982). The magnitude of the differences is less than one would expect, however, which suggests that preference for some conveniences (e.g., a map) and dislike of some intrusions (e.g., old bottles, rusted cans) may not directly correspond with ROS preferences.

CONCLUSIONS AND SUMMARY

Recreational use of forested areas is limited to a particular segment of society. Among forest users, ROS preferences have been shown to be related to the age, sex, and schooling of respondents; to the respondent's most frequent leisure activity; to forest attributes of the most recent site visited associated with that activity; to preferences for conveniences, and to dislikes of human intrusions.

Tentative classification guidelines or hypotheses generated from this study of Alabama residents are provided to help assess a forest's recreation value in terms of frequency of use:

1. Forest use depends on the younger individuals in the population. Support for facilities is less among nonusers than among users. Forests sur-

Table 18.—*Percent response by convenience preferred and ROS score*

Convenience	mcc[a]	All	ROS score: Urban −19 to −5	−4 to −1	0 to 3	4 to 8	Primitive 9 to 25
Convenience		(n=571)	(n=130)	(n=109)	(n=124)	(n=98)	(n=110)
Drinking water	.461	69	88	81	68	63	42
Map of trails and roads	[b]	51	55	55	52	51	42
Garbage collection	.386	47	67	54	44	40	25
Flush toilets	.564	45	72	60	47	29	12
Grocery store nearby	.488	44	66	59	42	31	16
Electric hook-ups or outlets	.559	40	70	46	46	22	10
Pit toilets	.262	25	25	28	31	32	9
Hot water	.421	25	44	26	29	15	5
Organized activities	.305	18	30	17	22	14	5
Few or no conveniences	.595	26	7	15	16	35	64

[a]Tests of significance performed on ROS score categories by preference and lack of preference for each listed convenience. Except where noted, $P(X^2) < .000$.

[b]$P(X^2) < .245$, contingency coefficient not applicable.

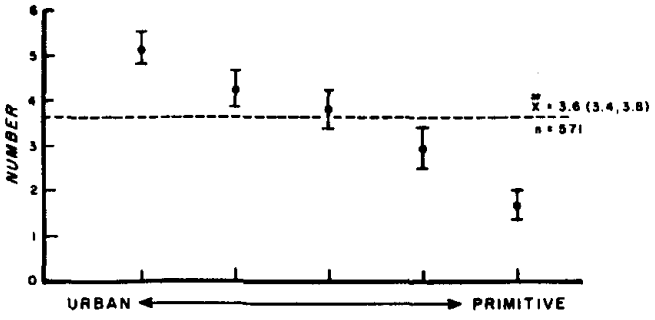

Figure 6.—*Average number of conveniences preferred (−, +2 standard errors) by ROS category.*

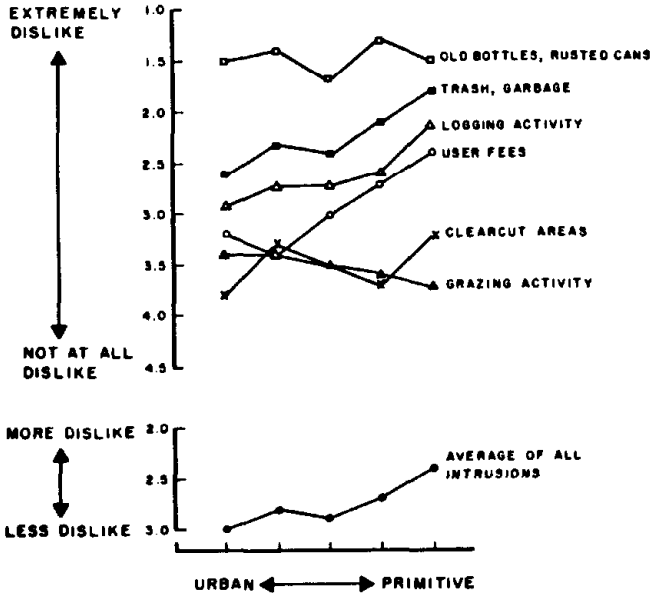

Figure 7.—*Average rating of human intrusions by ROS category. Category means that differ by more than 0.3 are significantly different at the 95 percent confidence level.*

rounded by older persons (e.g. those in retirement communities) will receive limited direct use and will receive less support from that segment of the population.

2. Water-based activities are the most common and most frequent leisure activities associated with forested areas. Areas adjacent to water bodies have the most use, regardless of user preferences. Most use occurs near roads and far from urban areas and within one hour of one's residence.
3. Half of the use associated with forested areas occurs inside forests, in mixed pine-hardwood stands, and in large forest stands. More use occurs in stands with limited screening, and of moderate age.
4. Forests with conveniences and without negative intrusions (such as old bottles and rusted cans) are preferred by more than half of the users.
5. Recreation Opportunity Spectrum (ROS) preferences represented in this study can be translated into forest recreation user preferences ranging from individuals interested in conveniences and direction, to those interested in freedom, and to those interested in isolation. User activities are aligned along the ROS as well: picknicking at the urban-end and hunting at the primitive-end of the spectrum.

Table 19.—*Average rating[a] (±2 SE) of dislike of human intrusions by type of intrusion*

Intrusion	Sample size	Average (± 2 SE)
Old bottles, rusted cans	573	1.5 ± .1
Trash, garbage	569	2.2 ± .1
Logging activity	565	2.6 ± .1
User fees	563	2.9 ± .1
Grazing by livestock	569	3.5 ± .1
Clearcut areas	561	3.5 ± .1
All intrusions	541	2.7 ± .1

[a]Scale: 1=extremely dislike, 2=very much dislike, 3=dislike somewhat, 4=dislike a little, 5=do not dislike.

6. Primitive recreation opportunities are preferred more by younger individuals, males, and those with more schooling; urban recreation opportunities are preferred more by older individuals, females, and those with less schooling. As demographic-related changes (increased leisure time, declining health) occur within society, so too will the use of forested areas for different recreation opportunities.
7. Forests near residences receive more use by primitive-oriented individuals, who substitute slower modes of travel or other forest attributes to achieve the sense of getting away from it all. Urban-oriented individuals use forests farther from their residences.
8. Given the nature of Alabama's public forest land (i.e., a limited land area, generally with adjacent resort facilities, conveniences, signs directing users, etc.), forests with urban-oriented users are more likely to be public forests. Private land is more likely to be used by primitive-oriented individuals.
9. Forests with primitive-oriented users are concentrated at 3/4 mile or more from roads and 2.5 miles or more from urban areas, and predominate at smaller water bodies. More of the forest acreage with primitive-oriented users predominate inside forest stands and in stands with intermediate screening.
10. More of the primitive-oriented users prefer few or no conveniences and are more negative about human intrusions than are urban-oriented users. The magnitude of the differences are less than expected, however, suggesting some conveniences and intrusions are not strictly tied to the recreation opportunity spectrum.

Further examination of the data and comparison with forest user and nonuser studies are needed to establish more quantifiable, predictive relationships between areas used frequently and those used infrequently. Previous reports of sample-based extensive forest inventory data (Rudis 1983, Saunders 1979, 1982) have shown that the proportion of forests with evidence of use are positively associated with nearness to water, roads, populated areas, and limited vegetative screening for selected regions. Reexamination of this data may provide one way of corroborating findings.

Forests used by Alabama residents represent the direct value of areas used for recreation. Forests not used have indirect recreation value, as some provide essential needs for wildlife and aesthetics or represent preferred but rarely experienced opportunities. As such, these classification guidelines should be used with caution. One should recognize also that standard guidelines, whether those suggested above or those in the ROS Users Guide (U.S. Forest Service 1982), favor certain segments of the population, recreation activities, and landscapes. Modification of standards is needed to account for the different mix of users, activities, and physical resources in a given region.

LITERATURE CITED

Boteler, R. N. 1986. Eastern/western wilderness use and users. *In*: Kulhavy, D. L., and Conner, R. N., eds. Wilderness and natural areas in the eastern United States: a management challenge. 1985 May 13–15; Nacogdoches, TX. Nacogdoches, TX: Center of Applied Studies, School of Forestry, Stephen F. Austin University: 212–217.

Brown, P. J.; Driver, B. L.; Berry, J. K. 1980. Use of the recreation opportunity planning system to inventory recreation opportunities on arid lands. *In*: Arid land resource inventories: developing cost efficient methods. Gen. Tech. Rept. WO-28. Washington, D.C.: U.S. Department of Agriculture, Forest Service: 123–128.

Brown P. J.; Driver, B. L.; McConnell, C. 1978. The opportunity spectrum concept and behavioral information in outdoor recreation resource supply inventories: background and application. *In*: Integrating inventories of renewable natural resources: Proceedings of the workshop. Gen. Tech. Rept. RM-55. 1978 January 8–12; Tucson, AZ; Ft. Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Exp. Stn.: 73–84.

Brown, T. C.; Daniel, T. C. 1984. Modeling forest scenic beauty: concepts and application to ponderosa pine. Research Paper RM-256. Ft. Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Exp. Stn. 35 p.

Buist, L.; Hoots, T. A. 1982. Recreation opportunity spectrum; approach to resource planning. J. For. 80: 84–86.

Burnett, G. W.; Conklin, D. G. 1979. Inventorying recreation potentials on dispersed tracts. J. For. 77: 765–768.

Clark, R. N. 1982. Promises and pitfalls of the ROS in resource management. Australian Parks and Recreation; May issue: 9–13.

Clark, R. N.; Stankey, G. H. 1979. The recreation opportunity spectrum: a framework for planning, management, and research. Gen. Tech. Rept. PNW-98. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Exp. Stn. 32 p.

Cordell, H. K.; Hendee, J. C. 1982. Renewable resources recreation in the United States; supply, de-

mand, and critical policy issues. Washington, D.C.: American Forestry Association. 88 p.

Doman, A.; Ennis, R.; Weigel, D. 1981. North Central Forest Experiment Station: Renewable resource evaluation field manual. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Exp. Stn.: 20–21.

Green, D. F. 1979. Can potential recreation areas be inventoried in the office? J. For. 77: 670–672, 691.

Hancock, H. K. 1973. Recreation preference: its relation to user behavior J. For. 71: 336–337.

Jackson, R. M.; Peyton, B. 1986. The developmental impact of age and years of experience on recreational values and behaviors. *In*: First national symposium on social science in resource management: program abstracts. CPSU/OSU 86-4. 1986 May 12–16; Corvallis, OR; Corvallis, OR: National Park Service and Department of Resource Recreation, Oregon State University: 226.

Kardell, L. 1985. Recreation forests-a new concept? Ambio 14(3): 139–147.

Labau, V. J. 1984. A review of nontimber data collection and information reported by the Forest Inventory and Analysis Projects in the United States. *In*: Schlatterer, E. and Lund, H.G.; eds. Proceedings of the inventory integration workshop, 1984, October 15–19; Portland OR; Washington, DC: U.S. Department of Agriculture, Forest Service, Range and Timber Management Staffs: 59–63, 153–165.

Lee, M. E.; Brown, P. J.; Manfredo, M. J. 1983. User utilization of planning criteria for inventorying and monitoring recreation resources. *In*: Bell, J. F. and Atterbury, T., eds. Renewable resource inventories for monitoring changes and trends. 1983 August 15–19; Corvallis, OR; Corvallis, OR: Oregon State University; College of Forestry: 318–322.

Liebetrau, A. M. 1983. Measures of association. Beverly Hills, CA: Sage Publications, Inc. 95 p.

McCool, S. F.; Stankey, G. H.; Clark, R. N. 1985. Choosing recreation settings: processes, findings, and research direction. *In*: Gen. Tech. Rept. INT-184. Proceedings-Symposium on recreation choice behavior. 1984 March 22–23; Missoula, MT. Ogden, UT: Intermountain Forest and Range Exp. Stn.: 1–8.

McClure, J. P.; Cost, N. D.; Knight, H. A. 1979. Multiresource inventories—A new concept for forest survey. Research Paper SE-191. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Exp. Stn. 68 p.

Mulligan, B. E.; Goodman, L. S.; Faupel, M.; Lewis, S.; Anderson, L. M. 1982. Interactive effects of outdoor noise and visible aspects of vegetation on behavior. *In*: Southeastern Recreation Research Conference 1980–81 Proceedings. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Exp. Stn.: 265–280.

Northeastern Forest Inventory and Analysis Unit. 1984. Field instructions for Southern New England. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Exp. Stn.: 59–61.

Rudis, V. A. 1983. Dispersed recreation inventory on commercial timberland. *In*: Bell, J. F. and Atterbury, T., eds. Renewable resource inventories for monitoring changes and trends. 1983 August 15–19; Corvallis, OR. Corvallis, OR: Oregon State University; College of Forestry: 214–218.

Rudis, V. A. 1986. Emerging patterns in the distribution of roadless forested areas in the Midsouth. *In*: Kulhavy, D. L., and Conner, R. N., eds. Wildernesss and natural areas in the eastern United States: a management challenge. 1985 May 13–15; Nacogdoches, TX. Nacogdoches, TX: Center for Applied Studies, School of Forestry, Stephen F. Austin University: 265–270.

Rudis, V. A.; Rosson, J. F.; Kelly, J. F. 1984. Resource. Bull. SO-98. Forest resources of Alabama. U.S. Department of Agriculture, Forest Service, New Orleans, LA: Southern Forest Exp. Stn. 55 p.

Saunders, P. R. 1979. Results of a multiresource inventory: analysis of undeveloped rural recreation sites in South Carolina. *In*: Selected reprints from the 1979 workshop on forest resource inventories; 1979 July 22–27, Fort Collins, CO; Washington, D.C.; Government Printing Office: 43–51.

Saunders, P. R. 1982. Characteristics of nondeveloped forest recreation from multiresource inventory plots in South Carolina. *In*: Southeastern Recreation Research Conference 1980-1981 Proceedings. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Exp. Stn.: 13–26.

Stankey, G. H.; Brown, P. J.; Clark, R. N. 1983. Monitoring and evaluating changes and trends in recreation opportunity supply. *In*: Bell, J. H. and Atterbury, T. eds. Renewable resource inventories for monitoring changes and trends. 1983 August 15–19; Corvallis, OR; Corvallis, OR: Oregon State University; College of Forestry: 227–230.

Statistical Analysis System. 1982. FASTCLUS. In: SAS user's guide: Statistics, 1982 Edition. Cary, NC: SAS Institute Inc.: 433–448.

Tuan, Y. F. 1977. Space and place. Minneapolis, MN: University of Minnesota Press. 235 p.

U.S. Fish and Wildlife Service and U.S. Bureau of the Census (USFWS/BC). 1980. 1980 National survey of fishing, hunting, and wildlife-associated recreation: Alabama. Washington, D.C.: U.S. Department of the Interior. 75 p.

U.S. Forest Service. 1982. ROS Users Guide. Washington, D.C.: U.S. Department of Agriculture, Forest Service. 38 p.

Appendix A—Hard to Reach Responses

Respondents whose forms were completed and received within 10 days of each survey phase are predominantly forest users. With additional time, responses from nonusers of forested areas increased (table A1). Hard-to-reach respondents, those whose forms were received after the first 20 days of each survey phase, are more likely to be of lower socioeconomic status (fewer years of education completed, fewer in professional occupations, and lower incomes), female, and less likely to subscribe to outdoor leisure magazines (table A2). Forms received between 10 and 20 days are somewhat less likely to be from SMSA counties, but forms from hard-to-reach respondents are as likely to come from SMSA counties as the earliest returns.

If one views the 519 nonrespondents as similar to hard-to-reach respondents, then responses from those of higher socioeconmic status, males, and those who subscribe to outdoor leisure magazines are overrepresented. Greater weight given to the hard-to-reach respondents (to have them represent all nonrespondents) results in a 1 percent decline in overall forest use, and similarly minor changes in percent participation by activity. The differences among ROS categories by time of response are not significant ($P(X^2) < .408$).

Table A1.—*Percent response by forest users, nonusers, and time period returned ($P(X^2) < .000$, mcc = .181)*

	Time period returned		
Type of respondent	First 10 days	Second 10 days	Remaining days
(sample size)	(849)	(705)	(627)
Forest users	85	82	73
Nonusers	15	18	27

Table A2.—*Percent response[a] by demographic characteristics and time period returned*

		Time period returned		
Characteristic	Statistics	First 10 days	Second 10 days	Remaining days
Age class	$P(X^2) < .052$	(n=842)	(n=696)	(n=622)
16–19		1	1	3
20–24		3	6	6
25–29		7	10	11
30–34		10	11	10
35–39		12	12	12
40–49		17	16	14
50–59		16	15	16
60–69		16	14	12
70 or over		16	16	16
Average age		49.8	47.8	47.2
Sex	$P(X^2) < .000$	(n=834)	(n=692)	(n=614)
Female	mcc=.198	31	33	47
Male		69	67	53
Education (years completed)	$P(X^2) < .000$	(n=820)	(n=675)	(n=604)
less than 6	mcc=.153	1	3	4
6, 7, 8		8	9	11
9, 10, 11		11	13	18
12		31	32	28
13, 14		17	19	16
15, 16		17	16	14
17 or more		15	9	9
Average years		13.1	12.6	12.1

Table A2.—*Percent response[a] by demographic characteristics and time period returned—Continued*

Characteristic	Statistics	Time period returned		
		First 10 days	Second 10 days	Remaining days
Number in household	$P(X^2)<.032$	(n=817)	(n=669)	(n=607)
1	mcc=.098	17	17	22
2		32	34	27
3		20	20	18
4		21	17	19
5		8	8	10
6 or more		3	4	4
Average		2.8	2.8	2.8
Urban/rural residence	$P(X^2)<.002$	(n=849)	(n=705)	(n=627)
SMSA[b] county	mcc=.109	69	60	67
Not in SMSA county		31	40	33
Occupation	$P(X^2)<.000$	(n=841)	(n=685)	(n=616)
Professional/technical/ managerial	mcc=.167	32	23	22
Factory/service worker		10	12	13
Craftsperson/mechanic		7	11	9
Salesperson/buyer		5	6	3
Student		3	5	5
Clerical/secretarial		4	4	5
Farmer		2	2	2
Laborer		1	2	1
Homemaker		5	8	10
Retired		29	26	26
Disabled or unemployed		1	2	3
Household income (before taxes, 1982)	$P(X^2)<.000$	(n=753)	(n=618)	(n=529)
Under $10,000	mcc=.188	20	25	36
10,000–19,999		23	27	26
20,000–29,999		23	21	18
30,000–39,999		16	15	8
40,000–49,999		8	6	6
50,000–59,999		4	3	2
60,000 or over		5	3	4
Average		$25,700	$22,600	$19,400
Number of outdoor leisure magazine subscriptions	$P(X^2)<.000$	(n=797)	(n=648)	(n=593)
None	mcc=.150	47	55	62
1		27	28	23
2		14	10	7
3		7	4	4
4 or more		4	3	3
Average		1.0	0.7	0.6

[a]Columns may not sum to 100 due to rounding.
[b]SMSA=Standard Metropolitan Statistical Area, U.S. Census 1980.

Appendix B—Incomplete ROS

Responses

A total preference score could not be computed for 267 respondents (31 percent of the 856 respondents) who did not complete the section on ROS preferences. Thirty-nine percent of the 267 respondents were hard-to-reach (responses received after the first 20 days of each survey phase). Many of these respondents failed to complete other parts of the questionnaire as well. A few individuals (about 30) were interviewed by telephone, were extremely reluctant to respond, and were not pressured to respond to this section or to other detailed questions on forest characteristics, preferences, or opinions about facilities.

Those who did not complete the section on ROS preferences (ROS "incompletes") are, on average, 9 years older, have one-year's less schooling, and earn $6,000 less than those who completed this section. Occupational status is more likely to be retired (35 percent), and less likely to be professional/technical/managerial (15 percent), than those who completed this section (16 percent retired, 33 percent professional/technical managerial). ROS incompletes are also most likely to be from one and two person households and female respondents (table B1). Differences among ROS categories by quality and variety of outdoor leisure facilities are not significant. The proportion of support for outdoor leisure facilities is about the same (86 percent); however, the amount of support is significantly lower for ROS incompletes (table B2). More of the ROS incompletes are engaged in "other" activities, i.e. observing nature, gathering and collecting activities, etc.; less are engaged in boating (table B3).

Data are examined by characteristics of the most recent site visited (tables B4-B12). Significant differences are found between completion of the ROS section and characteristics of the site, principally distance from nonforest land uses and onsite forest attributes (tables B9, B12). A larger proportion of ROS incompletes have responded with "don't know" to many of these questions. Of those who notice restrictions, ROS incompletes are less likely to notice signs (table B11).

Comparison of preferences for conveniences suggests fewer ROS incompletes are interested in a map, and they are more interested in having some conveniences than those who completed the ROS section (table B13). ROS incompletes are slightly more sensitive to grazing by livestock (table B14).

The finding that most ROS incompletes prefer some conveniences suggests that their ROS preferences are somewhere in the middle of urban and primitive settings. If one can assume that older age, being female, and completion of fewer years of schooling are associated with more urban-oriented preferences, then ROS incompletes score closer to the urban end of ROS preferences.

Not including ROS incompletes may create a bias in the analysis. Addition of ROS incompletes is likely to increase differences in the same direction along the ROS spectrum regarding sociodemographics and support for outdoor leisure facilities. Except as noted above, the bias in conclusions regarding ROS associations with characteristics of the site visited is believed to be negligible. (Imputation of ROS categories from answers to other sections of the questionnaire—e.g., preference for conveniences—would add to the complexity of computations without significantly altering conclusions.)

Table B1.—*Percent response*[a] *by demographic characteristics and completion of ROS section*

Characteristic	Statistics	All respondents	ROS section	
			Not completed	Completed
Age class	$P(X^2)<.000$	(n=851)	(n=264)	(n=587)
16–24	mcc=.406	8	7	9
25–29		11	6	13
30–34		12	9	13
35–39		15	11	16
40–49		18	13	21
50–59		15	17	14
60–69		12	17	10
70 or over		10	20	5
Average age		44.9	50.9	42.2
Sex	$P(X^2)<.002$	(n=839)	(n=260)	(n=579)
Female	mcc=.151	33	40	29
Male		67	60	71
Education (years completed)	$P(X^2)<.000$	(n=840)	(n=259)	(n=581)
8 or less	mcc=.291	8	13	6
9, 10, 11		12	16	11
12		32	37	29
13, 14		19	14	21
15, 16		17	12	19
17 or more		13	8	14
Average years		13.1	12.2	13.5
Number in household	$P(X^2)<.002$	(n=837)	(n=255)	(n=582)
1	mcc=.199	14	19	12
2		29	34	27
3		20	18	21
4		23	19	24
5 or more		14	11	16
Average		3.0	2.7	3.1
Urban/rural residence	$P(X^2)<.251$	(n=856)	(n=267)	(n=589)
SMSA[b] county		65	62	66
Not in SMSA county		35	38	34
Occupation	$P(X^2)<.000$	(n=847)	(n=262)	(n=585)
Professional/technical/ managerial	mcc=.380	27	15	33
Factory/service worker		14	15	14
Craftsperson/mechanic		10	9	11
Salesperson/clerical		9	7	10
Student		6	3	7
Homemaker		8	9	8
Retired		22	35	16
Other		4	7	3
Household income (before taxes, 1982)	$P(X^2)<.000$	(n=762)	(n=220)	(n=542)
Under $10,000	mcc=.332	19	33	14
10,000–19,999		27	27	27
20,000–29,999		22	15	25
30,000–39,999		16	13	18
40,000–49,999		6	4	7
50,000–59,999		5	4	5
60,000 or over		5	5	6
Average		$25,200	$21,100	$26,800
Number of outdoor leisure magazine subscriptions	$P(X^2)<.124$	(n=825)	(n=255)	(n=570)
None		46	51	44
1		28	29	28
2		14	11	15
3 or more		12	9	13
Average		1.0	0.9	1.0

[a]Columns may not sum to 100 due to rounding.
[b]SMSA=Standard Metropolitan Statistical Area, U.S. Census 1980.

Table B2.—*Average value of the quality, variety, and willingness to support (develop, improve, or maintain) outdoor leisure facilities associated with forested areas by completion of ROS section*

Opinion	All respondents	ROS section	
		Not completed	Completed
Quality[a] (−, +2SE)	2.22 (2.16, 2.29)	2.14 (2.01, 2.26)	2.26 (2.18, 2.34)
(sample size)	(761)	(213)	(548)
Variety[a] (−, +2SE)	2.51 (2.44, 2.58)	2.40 (2.27, 2.53)	2.55 (2.47, 2.63)
(sample size)	(726)	(187)	(539)
Percent willing to support[b]	86	86	86
(sample size)	(630)	(142)	(488)
Dollars[c] (−, +2SE)	48 (38, 47)	27 (21, 35)	48 (43, 54)
Hours[c] (−, +2SE)	18 (15, 22)	10 (7, 15)	22 (18, 27)
(sample size)	(542)	(122)	(420)

[a]Scale: 1=excellent; 2=good; 3=fair; 4=poor; 5=absent.
[b]$P(X^2) < .964$.
[c]Average only of those indicating support. Log transformations used in computations.

Table B3.—*Percent response[a] by most frequent leisure activity and completion of ROS section ($P(X^2) < .000$, mcc = .211)*

Activity	Sample size	All respondents	ROS section	
			Not completed	Completed
Picnicking	74	9	8	9
		(100)	(30)	(70)
Camping	87	10	8	11
		(100)	(25)	(75)
Fishing	194	23	24	22
		(100)	(33)	(67)
Sightseeing	161	19	17	20
		(100)	(29)	(71)
Boating	62	7	2	10
		(100)	(6)	(94)
Other[b]	120	14	20	11
		(100)	(44)	(56)
Hunting	158	18	21	17
		(100)	(35)	(65)
Column total	856	100	100	100
(Row total)		(100)	(31)	(69)

[a]Rows and columns may not sum to totals due to rounding.
[b]Observing nature, gathering and collecting, and miscellaneous activities, including no one most frequent leisure activity indicated.

Table B4.—*Average distance traveled from residence by completion of ROS section*

Unit of measure[a]	All respondents	ROS section	
		Not completed	Completed
Miles (Sample size)	19 (n=765)	15 (n=195)	20 (n=570)
(−, +2SE)	(17, 21)	(12, 19)	(18, 23)
Hours (Sample size)	0.8 (n=753)	0.8 (n=191)	0.8 (n=562)
(−, +2SE)	(0.7, 0.9)	(0.6, 0.9)	(0.7, 0.9)
Miles per hour (Sample size)	25 (n=725)	23 (n=181)	26 (n=544)
(−, +2SE)	(23, 27)	(19, 27)	(24, 29)

[a]Logarithmic transformation used in computations.
SE = standard error of the estimate.

Table B5.—*Percent response[a] by major mode of transportation and completion of ROS section ($P(X^2) < .179$)*

Mode of transportation	All respondents	ROS section	
		Not completed	Completed
	(n=784)	(n=205)	(n=579)
Auto	60	61	60
Truck, van or motor home	26	27	25
On foot	7	8	6
Other[b]	8	4	9

[a]Columns may not sum to 100 due to rounding.
[b]Includes motorcycle, train or bus, airplane, bicycle, and no major mode indicated.

Table B6.—*Percent response[a] by ease of travel and completion of ROS section ($P(X^2) < .730$)*

Ease of travel	All respondents	ROS section	
		Not completed	Completed
	(n=787)	(n=207)	(n=580)
Difficult or somewhat difficult	8	9	8
Somewhat easy	30	28	31
Very easy	62	64	62

[a]Columns may not sum to 100 due to rounding.

Table B7.—*Percent response[a] by ownership of most recent site visited and completion of ROS section ($P(X^2) < .168$)*

Ownership	All respondents	ROS section	
		Not completed	Completed
	(n=778)	(n=200)	(n=578)
Public agency	46	40	48
Farmer	11	12	11
Other private	29	35	28
Don't know	14	13	15

[a]Columns may not sum to 100 due to rounding.

Table B8.—*Percent response[a] by type of association with private owner of most recent site visited and completion of ROS section ($P(X^2)<.406$)*

Private owner association	All respondents	ROS section	
		Not completed	Completed
	(n=410)	(n=114)	(n=296)
Self, friend, or relative	44	46	43
Someone else	26	21	27
Don't know	30	33	29

[a]Columns may not sum to 100 due to rounding.

Table B9.—*Percent response[a] by distance from nonforest land uses and completion of ROS section*

Land feature/distance	Statistics	All respondents	ROS section	
			Not completed	Completed
Roads	$P(X^2)<.019$	(n=758)	(n=192)	(n=566)
100 feet	mcc=.158	22	17	24
100 yards		18	17	19
1/4 mile		17	20	16
1/2 mile		15	17	14
1 or 2 miles		15	11	16
3 miles or more		6	7	6
Don't know		6	11	5
Farms	$P(X^2)<.011$	(n=753)	(n=184)	(n=569)
100 feet	mcc=.165	9	11	8
100 yards		8	9	8
1/4 mile		11	14	11
1/2 mile		10	10	11
1 or 2 miles		17	18	17
3 miles or more		22	12	25
Don't know		22	27	20
Urban or built-up land	$P(X^2)<.035$	(n=733)	(n=173)	(n=560)
100 feet or 100 yards	mcc=.143	8	6	8
1/4 mile		9	10	9
1/2 mile		7	6	8
1 or 2 miles		14	19	13
3 miles or more		48	40	51
Don't know		14	19	12
Water bodies	$P(X^2)<.021$	(n=724)	(n=179)	(n=545)
100 feet	mcc=.160	40	34	42
100 yards		15	13	16
1/4 mile		14	12	14
1/2 mile		10	12	9
1 or 2 miles		7	8	6
3 miles or more		6	7	6
Don't know		8	14	6

[a]Columns may not sum to 100 due to rounding.

Table B10.—*Percent response[a] by size of water body near most recent site visited and completion of ROS section ($P(X^2) < .126$*

Size of water body	All respondents	ROS section	
		Not completed	Completed
Stream or creek	(n=727)	(n=182)	(n=545)
(100 feet wide or less)	24	24	24
Pond			
(1 acre or less)	11	16	10
Small river or lake			
(100 feet - 1/4 mile wide)	17	14	17
Large river, lake, or coastal waters			
(greater than above)	48	46	49

[a]Columns may not sum to 100 due to rounding.

Table B11.—*Percent response[a] by restrictions from public use of most recent site visited and completion of ROS section*

Restriction	$P(X^2)$	All respondents	ROS section	
			Not completed	Completed
Notice anything?	.127	(n=758)	(n=191)	(n=567)
Yes		33	29	35
No		59	61	58
Don't know		8	10	7
Item noticed		(n=253)	(n=55)	(n=198)
Signs	.004[b]	46	29	51
Fences	.247	45	38	47
Posted, no hunting	.566	44	47	43
No trespassing or keep out	.811	33	35	33
Hunt club, members only	.806	25	24	25

[a]Columns may not sum to 100 due to rounding.
[b]mcc=.256.

Table B12.—*Percent response*[a] *by forest attributes of most recent site visited from land features and completion of ROS section*

Attribute/subcategory	Statistics	All respondents	ROS section	
			Not completed	Completed
Location relative to a forest	$P(X^2)<.391$	(n=716)	(n=158)	(n=558)
Outside		48	51	47
Inside		52	49	53
Vegetative screening	$P(X^2)<.000$	(n=779)	(n=197)	(n=582)
Limited	mcc=.207	36	36	36
Intermediate		27	17	30
Dense		21	21	21
Don't know		16	26	13
Type of forest vegetation	$P(X^2)<.000$	(n=781)	(n=199)	(n=582)
Mostly pines	mcc=.181	17	17	17
Pine/hardwood mix		49	43	52
Mostly hardwoods or upland hardwoods		9	11	8
Bottomland hardwoods		14	11	15
Don't know		11	19	8
Forest size	$P(X^2)<.001$	(n=771)	(n=195)	(n=576)
less than 10 acres	mcc=.169	12	13	11
10–40 acres		17	13	18
Greater than 40 acres		49	41	51
Don't know		23	33	20
Diameter of majority of trees	$P(X^2)<.006$	(n=773)	(n=193)	(n=580)
Wrist or smaller	mcc=.153	7	8	7
1/2 shoulder width		39	31	41
Shoulder width		24	21	25
Larger or mixed		9	10	9
Don't know		21	30	18

[a]Columns may not sum to 100 due to rounding.

Table B13.—*Percent response and average number of conveniences preferred by completion of ROS section*

Convenience preferred	$P(X^2)$[a]	All respondents	ROS section	
			Not completed	Completed
Convenience		(n=732)	(n=161)	(n=571)
Drinking water	.363	68	65	69
Map of trails and roads	.005[b]	48	39	51
Garbage collection	.827	47	46	47
Flush toilets	.552	46	48	45
Grocery store nearby	.183	45	50	44
Electric hook-ups or outlets	.383	40	37	40
Pit toilets	.428	26	28	25
Hot water	.347	24	21	25
Organized activities	.953	18	18	18
Few or no conveniences	.001[c]	23	14	26
Average number of conveniences ±2 SE		3.6±.2	3.5±.2	3.6±.2

SE=Standard error of the estimate.

[a]Chi-square test performed on ROS section completed and not completed by preference and lack of preference for each listed convenience.

[b]mcc=.148.

[c]mcc=.173.

Table B14.—*Average rating[a] (±2 SE) of dislike of human intrusions by type of intrusion and completion of ROS section*

Intrusion	All respondents	ROS section	
		Not completed	Completed
Old bottles, rusted cans (sample size)	1.5±.1 (725)	1.6±.2 (152)	1.5±.1 (573)
Trash, garbage	2.2±.1 (711)	2.2±.3 (142)	2.2±.1 (569)
Logging activity	2.6±.1 (700)	2.6±.3 (135)	2.6±.1 (565)
User fees	3.0±.1 (695)	3.0±.3 (132)	2.9±.1 (563)
Grazing by livestock	3.4±.1 (706)	3.0±.3 (138)	3.5±.1 (569)
Clearcut areas	3.5±.1 (691)	3.3±.3 (130)	3.5±.1 (561)
All intrusions	2.7±.1 (648)	2.7±.2 (107)	2.7±.1 (541)

[a]Scale: 1=extremely dislike, 2=very much dislike, 3=dislike somewhat, 4=dislike a little, 5=do not dislike.

Appendix C—Questionnaire

The following questionnaire is the long form used for the January 1984 survey. The short form contained Part A: question 1, Part B, and Part C. The phrase "other than fishing" in Part A question 2a was omitted in the April 1983 and September 1983 phases.

(Note: Part A: questions 2b and 2c were used with the short form to assess frequency of participation by season. The short form also contained questions on the frequency of participation by distance from residence and counties visited by season. Results are not available at this time.)

PART A - OUTDOOR LEISURE ACTIVITIES

OMB. No. 0596-0077

Expires 3-31-84

1. Which of the following do you do currently*

IN OR NEAR FORESTED AREAS?

(Check all that apply)

- Birdwatching, observing other wildlife or plants . . . . . []
- Picnicking . . . . . []
- Hunting waterfowl (geese, ducks, etc.) . . . . . []
- Camping at developed sites (motorized access). . . . . []
- Non-motorized boating (canoeing, kayaking, sailing, tubing, etc.) . . . . . []
- Backcountry camping (non-motorized access) . . . . . []
- Hunting big game (deer, etc.) . . . . . []
- Motorized boating. . . . . []
- Hunting small game (turkey, other upland birds, rabbits, squirrels, etc.) . . . . . []
- Fishing. . . . . []
- Gathering and collecting activities (mushrooms, berries, nuts, firewood, etc.) . . . . . []
- Sightseeing (viewing scenery, natural, historic sites, man-made features). []
- Staying overnight at a resort lodge or cabin . . . . . []
- Nature study or photography. . . . . []
- Other (specify)_____

IF YOU DO NOT CURRENTLY* DO ANYTHING IN OR NEAR FORESTED AREAS, WRITE IN YOUR MOST FREQUENT LEISURE ACTIVITY _____ AND SKIP TO PART B.

*Currently - in the past 2 years.

2. (a) Other than fishing, WHICH ONE OF THE ABOVE is your MOST FREQUENT LEISURE ACTIVITY?

Please specify _____

(b) ABOUT HOW MANY TIMES (OCCASIONS) did you do this activity between Labor Day and New Year's Day (September 6, 1983 and January 1, 1984)? _____

(c) When was the LAST TIME you participated in this activity?. . . . . Month_____Year____

Now I would like some information about the LOCATION WHERE YOU LAST DID your MOST FREQUENT leisure activity (QUESTION 2a).

3. ABOUT HOW MANY MILES was it FROM YOUR HOME? . . . . . _____miles

4. HOW DID YOU GET THERE? (If more than one, put an "x" by major one.)

Bicycle	[]	Camper or motor home	[]
Automobile.	[]	On foot.	[]
Motorcycle.	[]	Train, bus, streetcar,or	
Truck or van	[]	other surface transportation. . .	[]
Boat.	[]	Airplane	[]

5. HOW LONG does it take to travel from your home directly to this area by the the major type of transportation listed in question 4 ?. . . . . ____ hours

6. In your opinion, HOW EASY is it for you to get there? (Check one)

Very difficult.	[]	Somewhat easy.	[]
Somewhat difficult.	[]	Very easy.	[]

7. WHO WAS IN CHARGE of the land? (Check one)

U.S. Forest Service (e.g. National Forest Land) . . . . . []

Other public agency (e.g. TVA, State Park, etc.). . . . . []

Service organization

(e.g. Church, YMCA, Boy Scouts, other non-profit agency). . . . . []

Farmer, group of farmers. . . . . []

Private industry or other individuals . . . . . []

Don't know. . . . . []

IF YOU DON'T KNOW, who would you GUESS was in charge of the land?

Public agency. . . . . []

Private industry . . . . . []

Other private landowner. . . . . []

8. If this land was PRIVATELY OWNED, who owned it? (Check one)

Yourself, friend, neighbor, or relative . . . . . []

Timber or other wood products company . . . . . []

Company or individual whose business is supplying leisure facilities (e.g. private campgrounds, Alabama Power Company Areas). . . []

Private company whose business is not supplying leisure facilities or wood products

(e.g. employer-sponsored recreation areas). . . . . []

Someone else. . . . . []

Don't know. . . . . []

9. About HOW FAR were you FROM a ROAD? (Check one. If engaged in activities on foot, check the MAXIMUM distance traveled from a known road.)

100 feet. . . . . []	1/2 mile . . . . . []
100 yards . . . . . []	1 or 2 miles . . . . . []
1/4 mile. . . . . []	3 miles or more. . . . . []
	Don't know . . . . . []

About HOW FAR AWAY were you FROM the following land forms (Questions 11-13):

10. FARMS, or OTHER CULTIVATED FIELDS? (Check one)

100 feet. . . . . []	1/2 mile . . . . . []
100 yards . . . . . []	1 or 2 miles . . . . . []
1/4 mile. . . . . []	3 miles or more. . . . . []
	Don't know . . . . . []

11. URBAN, or BUILT UP LAND? (Check one)

(A concentration of shops, stores, a residential subdivision, or factories. NOT farm buildings, powerlines, or roadways.)

100 feet. . . . . []	1/2 mile . . . . . []
100 yards . . . . . []	1 or 2 miles . . . . . []
1/4 mile. . . . . []	3 miles or more. . . . . []
	Don't know . . . . . []

12. A BODY OF WATER? (Check one)

(e.g. stream, river, pond, lake or coastal bay)

100 feet. . . . . []	1/2 mile . . . . . []
100 yards . . . . . []	1 or 2 miles . . . . . []
1/4 mile. . . . . []	3 miles or more. . . . . []
	Don't know . . . . . []

13. If you were near a water body, about HOW LARGE was it? (Check one)

Small stream or creek no wider than 100 feet. . . . . []

Pond (no larger than a football field). . . . . []

Small river or lake

(no more than 1/4 mile at its widest point) . . . . . []

Large river or lake . . . . . []

Coastal waters (salt water) . . . . . []

14. WHERE did you do MOST of your leisure activities IN RELATION TO A FOREST?

(Check one)

Outside (e.g. in a field, along the forest edge). . . . . []

Inside (e.g. along a wooded trail). . . . . []

15. DID YOU NOTICE any indication that the land was restricted from public use?

(Check one) Yes [] . .No [] . .Don't Know []

If YES, what did you notice?

(Check all that apply)

Fences. . . . . []

Signs . . . . . []

No Hunting, "Posted". . . . . []

Hunt club-members only. . . . . []

No trespassing or keep out. . . . . []

Now, I would like for you to THINK ABOUT WHAT THE FOREST LOOKED LIKE. If you don' know or can't remember - DON'T GUESS! - Check the "don't know" box.

16. KIND OF FOREST VEGETATION (Check one)

I. OPEN, few shrubs or tree branches at eye level. EASY TO SEE other persons or wildlife, e.g., at 50 feet. EASY TO WALK through the forest, on or off trails . . . . . []

II. DENSE, NOT EASY TO SEE, NOT EASY TO WALK through the forest, except on trails . . . . . []

INTERMEDIATE, between I. and II. . . . . []

Don't know . . . . . []

17. TYPE OF FOREST (Check one)

MAINLY PINES - evergreen, with needle-like leaves . . . . . []

MAINLY HARDWOODS - generally deciduous (without leaves in winter) . . []

MIXTURE OF PINES AND HARDWOODS. . . . . []

Don't know. . . . . []

18. IF HARDWOODS, what was the ground like? (Check one)

Bottomlands - usually WET, often flooded in Spring. . . . . []

Uplands - usually DRY, rarely flooded . . . . . []

Don't know. . . . . []

19. FOREST SIZE (Check one)

Small, EASY TO REACH OPPOSITE FOREST EDGES, less than 10 acres. . . . []

Large, NOT ABLE TO REACH OPPOSITE FOREST EDGES, 40 acres or more. . . []

Intermediate in size, between 10 and 40 acres . . . . . []

Don't know. . . . . []

20. TREE SIZE/FOREST AGE

At chest level, THE SIZE (DIAMETER) of the MAJORITY OF TREE TRUNKS WERE: (Check one)

SMALLER than your WRIST. . . . . []

ABOUT as wide as your WRIST. . . . . []

HALF as wide as your SHOULDERS . . . . . []

ABOUT as wide as your SHOULDERS. . . . . []

WIDER than your SHOULDERS. . . . . []

Don't know . . . . . []

For the following, THINK OF A PLACE YOU WOULD LIKE TO GO to pursue your MOST FREQUENT LEISURE ACTIVITY (Question 2a).

21. HOW IMPORTANT is having EACH OF THE FOLLOWING ACTIVITIES OR FACILITIES IN THE VICINITY? (NOT necessarily at your site, but in the general area.)

(CHECK ONE FOR EACH ROW OF BOXES)

	LEVEL OF IMPORTANCE				
	extremely	very much	some what	a little	not at all
Supervision and protection.	[]	[]	[]	[]	[]
Mixing with persons not traveling with you, but engaged in similar activities	[]	[]	[]	[]	[]
Large natural area far from human settlements.	[]	[]	[]	[]	[]
Small natural area near human settlements.	[]	[]	[]	[]	[]
Well-marked area, signs directing users to facilities and activities . .	[]	[]	[]	[]	[]
Area free from human restrictions or controls	[]	[]	[]	[]	[]
Being far from sights and sounds of other people*	[]	[]	[]	[]	[]
Area where motorized travel is possible .	[]	[]	[]	[]	[]
Area with no evidence of human use. . . .	[]	[]	[]	[]	[]
Area where motorized travel is not permitted.	[]	[]	[]	[]	[]
Being near sights and sounds of other people*.	[]	[]	[]	[]	[]

* Other people - persons not directly associated with you or your activities.

22. WHICH of the following conveniences would you PREFER to have at this place?

(Check all that apply)

Garbage collection. . . . []	Pit toilets. . . . []	Grocery store nearby . . . . . []
Electrical hook-ups or outlets . . . . . []	Map of the trails and roads. . . . []	Organized activities for outdoor appreciation. . . []
Drinking water. . . . . []	Hot water. . . . . []	
Very few or no conveniences . . . . . []		Flush toilets . . . []

23. HOW MUCH would you DISLIKE having EACH OF THE FOLLOWING IN THE VICINITY?

(CHECK ONE FOR EACH ROW OF BOXES)

	extremely dislike	very much dislike	dislike somewhat	dislike a little	do not dislike
User fees	[]	[]	[]	[]	[]
Trash, garbage.	[]	[]	[]	[]	[]
Logging activity.	[]	[]	[]	[]	[]
Grazing by cattle, other livestock. . . .	[]	[]	[]	[]	[]
Clearcut areas.	[]	[]	[]	[]	[]
Old bottles, rusted cans.	[]	[]	[]	[]	[]

Part B - OUTDOOR LEISURE FACILITIES

Now I would like to ask you about OUTDOOR LEISURE FACILITIES ASSOCIATED WITH FORESTED AREAS.

1. What is YOUR OPINION of THESE FACILITIES?

	excellent	good	fair	poor	absent
The QUALITY is (check one)	[]	[]	[]	[]	[]
The VARIETY is (check one)	[]	[]	[]	[]	[]

I would like YOUR OPINION of OUTDOOR LEISURE FACILITIES IN OR NEAR FORESTED AREAS you would like to see developed, improved, or maintained.

2. PLEASE CIRCLE, OR WRITE IN, the annual amount of money you would be willing to spend and amount of time you would be willing to volunteer for EACH OF THE FOLLOWING FACILITIES:

(FOR EACH ROW, INDICATE AN AMOUNT IN DOLLARS AND IN HOURS.)

Facilities IN OR NEAR FORESTED AREAS	Annual amount (dollars)					Annual volunteer time (hours)				
Bicycle or jogging trails	$0	$1	$5	$25	$__	0	4	8	40	__ hours
Fishing areas	0	1	5	25	__	0	4	8	40	__
Nature trails	0	1	5	25	__	0	4	8	40	__
Greenbelts along roadways	0	1	5	25	__	0	4	8	40	__
Woodlands, nature preserves	0	1	5	25	__	0	4	8	40	__
Camping areas with limited facilities (drinking water and pit toilets). .	0	1	5	25	__	0	4	8	40	__
Hunting areas (game management areas).	0	1	5	25	__	0	4	8	40	__
Camping areas with full facilities (electrical hookups, hot water, flush toilets, etc.).	0	1	5	25	__	0	4	8	40	__
Hiking trails	0	1	5	25	__	0	4	8	40	__
Public access to lakes, rivers. . . .	0	1	5	25	__	0	4	8	40	__
Picnic areas.	0	1	5	25	__	0	4	8	40	__
Camping areas with no facilities. . .	0	1	5	25	__	0	4	8	40	__
Wildlife refuges.	0	1	5	25	__	0	4	8	40	__
Other (specify) _____					$_____					_____ hours

PART C - DEMOGRAPHICS

Now I would like to ask you a few questions to help statistically compare your responses with the general population.

THESE QUESTIONS WILL NOT BE USED TO IDENTIFY YOU PERSONALLY IN ANY WAY.

1. *Into which AGE GROUP do you fall?*

. . . . . .16-19 []	30-34 []	50-59 . . .[]
. . . . . .20-24 []	35-39 []	60-69 . . .[]
. . . . . .25-29 []	40-49 []	70 or over.[]

2. What is your sex? (Check one) . . . . . .Female []

. . . . . .Male []

3. Circle the highest grade (or year) of schooling you have completed.

Elementary less than 6 6 7 8 High school 9 10 11 12

College 1 2 3 4 5 6 7 8 or more

4. Including yourself, HOW MANY PERSONS are there in your household?

(Circle one) 1 2 3 4 5 6 7 8 or more persons

5. WHERE DO YOU LIVE?

State _____

County _____

6. What is your primary OCCUPATION? (Check one)

Retired. . . . . []

Homemaker. . . . . []

Craftsperson/mechanic. . . . . []

Clerical/secretarial . . . . . []

Professional/technical/managerial. . . . . []

Factory or service worker. . . . . []

Farmer . . . . . []

Student. . . . . []

Salesperson/buyer. . . . . []

Other (please specify)_____

7. Do you or members of your household subscribe to any of the following magazines? (Check all that apply)

National Wildlife	[]	Mississippi Game and Fish . . .	[]
Sports Afield	[]	Camping Journal	[]
Florida Wildlife.	[]	Southern Outdoors	[]
Outdoor Life.	[]	Alabama Conservation.	[]
Backpacker	[]	Field and Stream.	[]
Audubon Magazine.	[]	Southern Living	[]

Another magazine similar to those above (specify) _____

No, do not subscribe to any of the above. . . . . []

8. Which best describes your family's total income for 1982? (Please check the approximate amount before deductions for taxes, bonds, dues, etc.)

Under $10,000	[]	$40,000 - 49,999.	[]
$10,000 - 19,999.	[]	$50,000 - 59,999.	[]
$20,000 - 29,999.	[]	$60,000 - 69,999.	[]
$30,000 - 39,999.	[]	$70,000 or over	[]

- - - THAT'S IT! THANK YOU VERY MUCH! - - -

Rudis, Victor A. Recreational use of forested areas by Alabama residents. 1987. Research Paper SO-237. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station; 37 p.

Findings are presented from a 1983–84 survey of forest recreation use by Alabama residents. Relationships are explored among demographics of forest users and nonusers. Suggested are hypotheses for use in classifying regional forest inventory data in terms of recreation use and user categories associated with a range of preferences.

Keywords: recreation opportunity spectrum, forest inventories, forest user demographics, outdoor recreation, leisure activities, nonusers.