User Evaluation of Campgrounds on Two Michigan National Forests

Robert C. Lucas

The Problem

Recreational areas vary widely in amount of use; some places are crowded, while others are only lightly visited. For example, the most popular Minnesota State Park campground received 14 times as much use per unit as the least popular in 1961 (Minnesota Outdoor Recreation Resources Commission 1965). Some Superior National Forest campgrounds in Minnesota received more than six times as many group visits per unit as others in 1961 (Lucas 1964), and more than five times as many in 1967.[1] Better selection of sites for recreational development, based on a better understanding of the reasons for uneven visitor distribution, could improve public enjoyment and operating efficiency.

Objective

The main objective of this study was to determine how variation in recreational use among campgrounds is related to characteristics of the campground sites and to people's ideas about them. Variation among sites within campgrounds is not included. Although use of campgrounds, picnic areas, beaches, and access points to lakes and streams on the Huron and Manistee National Forests in Michigan's Lower Peninsula was investigated, the study emphasized campground use; therefore, this paper will make only incidental references to other recreation uses.

[1] *Lime, David W. A spatial analysis of auto-camping in the Superior National Forest of Minnesota: models of campground selection behavior. (Ph.D. thesis on file at University of Pittsburgh.)*

Study Approach

The key to understanding the role of factors related to recreational use distribution lies in understanding people's perception of their environment. We assume people choose recreation sites from among those they know about on the basis of how desirable they think the places are for their purposes, and their view of the time, effort, and cost of visiting them. People vary in their knowledge, purposes, standards of desirability, and willingness to make the effort to use particular locations.[2] Some people study maps and plan trips all winter; others jump in the car with a vague destination and pull into the first place they see. We assume the pattern of total use is a composite of decisions arrived at in many different ways.

Therefore, I will first explain how observed differences in campground use relate to characteristics of existing sites.[3] Most of the factors that we would expect to influence use distribution fall into one of three

[2] *The fact that half the Huron-Manistee campers in 1962 were visiting these forests for the first time suggests a greater than normal role for chance in location choices. This low level of prior experience may not be unusual, however; one-third of the campers on the Huron National Forest were newcomers in 1966 (Krejcarek, Don E. An analysis of family campers' socioeconomic characteristics, preferences, and attitudes toward fees on the Huron National Forest. Unpubl. M.S. thesis, Mich. State Univ.)*

[3] *This general approach is also used in a recent study of use of New York State Parks in the Adirondack region (Shafer and Thompson 1968).*

categories — resource characteristics at the site, the facilities there, and its relative location or accessibility. No fees were charged at any of the sites at the time of the study, and regulations were identical except for two locations where campers were turned away when the campground was full.

Second, I will analyze visitors' attitudes concerning the resources at the site, the type and quality of facilities, crowding and user conflicts, general satisfaction, and sources of information about the area. Resource quality ratings made as part of the National Forest Recreation Survey or NFRS (USDA Forest Service 1959) will be compared to visitors' ratings of the same resources.

The Study Area

The Huron and Manistee National Forests are located where the urbanized, industrialized Midwest ends and the northwoods begin (fig. 1). More than 90 percent of Michigan's people live south of the two National Forests; thus these Forests are in the front lines facing the northward flow of recreationists.

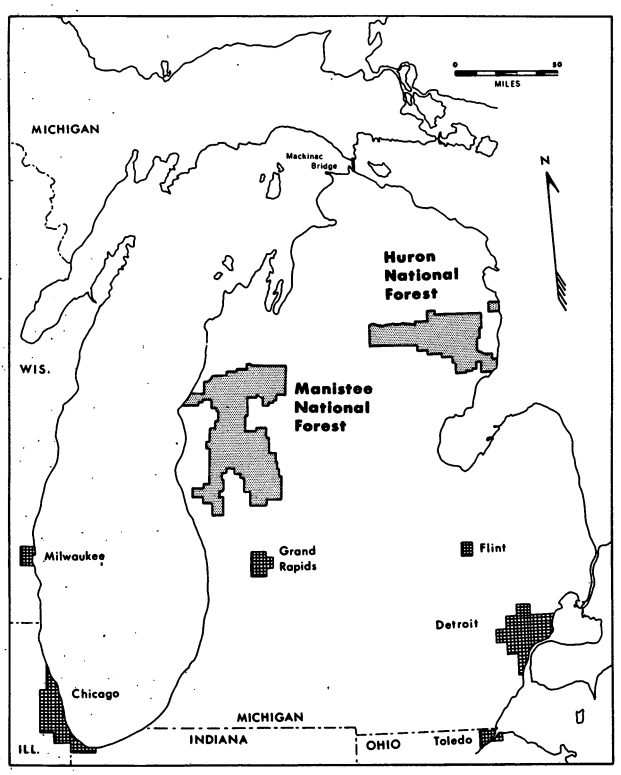

Figure 1. — The location of the Huron and Manistee National Forests.

The two Forests have similar recreational resources. Both are on sandy glacial deposits, sometimes rolling or hilly, but primarily a plain (University of Michigan 1967). Small lakes are common. Streams are numerous and many support trout (the Coho salmon fishery developed after this study). Second-growth forests of mixed deciduous and coniferous trees cover most of the area. Both Forests had substantial recreational facilities. There were 22 campgrounds, many with picnic areas, and eight separate picnic areas in 1962 when the fieldwork for the study was carried out. A dense network of roads crisscrossing both Forests made access generally easy, but hiking trails were limited. Official Forest Service recreation-use estimates show that the Huron-Manistee was among the most visited National Forests in 1962.

State Parks are fairly abundant near the Forests, especially along the Lake Michigan shore. There are several State Forests in the region, but they had little recreational development. Summer home and small resort development was extensive, but private campgrounds were few and small.

Study Methods

The Sample

The study was conducted from April 28 through September 14, 1962. This included all of the trout-fishing season. The camping season was divided into four 5-week periods.[4] Each campground was checked seven times during a 5-week period, each time on a different day of the week. Thus, each campground was checked a total of 28 times during the season. All checks were made between 1:00 p.m. and 9:00 p.m. Occupied sites were tallied, and one-fourth (as nearly as possible, but at least one) of them were selected as samples using random numbers. If there were one through five groups in the campground, one group was interviewed; if six through nine groups, two were interviewed, and so on. Occupied but unattended sample sites were revisited before leaving the area, and again later in the day if possible, before a substitute was randomly chosen. None of the campers

[4] *For a more detailed explanation of sample date selection see King, David A. Sampling and length-of-stay bias adjustment; for a fuller treatment of sampling see Lucas, Robert C. The distribution of recreational use on the Huron-Manistee National Forests. (Unpublished reports on file at N. Cent. Forest Exp. Sta., St. Paul, Minn.)*

refused to be interviewed. This procedure produced 597 interviews, which means that 13 percent of the estimated number of groups visiting the area were interviewed.

The group spokesman, generally the head of the household, answered for the group. Whether interviewing the spokesman comes closer to revealing the group consensus (which we assume determines the group's decisions) than interviewing each individual is not known.

The interview data were affected by length-of-stay bias like all other on-site recreation surveys. Groups staying a longer time were overrepresented relative to those staying more briefly. This effect was removed by a computer program that weighted interviews (Lucas and Schweitzer 1965).

Use Estimates

Estimates of numbers of visitors and man-days of use at each location were made from the use tallies. Three sample campgrounds were checked 4 days each, every hour from 11:00 a.m. to 9:00 p.m., and ratios of overnight use to hourly use were used to adjust the observed use totals. For example, a campground with 18 sites occupied at 5:00 p.m. on a Friday would be estimated to have had 19.6 overnight groups. These adjusted estimates were then expanded for each location.

The minimum acceptable precision for recreation-use estimates given in the Forest Service Manual is ± 25 percent at the 67-percent confidence level. Estimates for 17 of 22 campgrounds met this standard. The five that did not received light use — less than half as much use per unit as the average for all campgrounds.

Resource and Location Variables

The resource variables were provided by the National Forest staff from the 1959-1960 inventory data (NFRS), supplemented when necessary.

Each location was classified in the NFRS as to location relative to water (USDA Forest Service 1959). There were six categories:

1. Accesible to a lake or reservoir (10 acres or more).
2. Accessible to a pond (under 10 acres).
3. Accessible to a river navigable for boats and canoes.
4. Accessible to a river navigable only by canoes.
5. Accessible to a small stream (nonnavigable).
6. Not accessible to a body of water.

There were no campgrounds in categories 2 and 6.

The NFRS ratings of the beach, fishing, boating water, canoeing water, and occupancy site quality (outstanding, good, fair, unsatisfactory, absent) were treated as equally spaced points on a scale, as they were in the inventory, and were assigned numbers 1, 3, 5, 7, and 9.

Relative location was measured in terms of road miles over normal travel routes:

1. Shortest distance to the Great Lakes.
2. Distance to the nearest State highway.
3. Distance to the nearest paved highway.
4. Distance to the nearest campground (whether National Forest, State Park, or other).
5. Average distance to the three nearest National Forest campgrounds (a measure of clustering).
6. Distance to Flint or Grand Rapids, Michigan, whichever was closest. This was a measure of relative distance from the main population of potential visitors, which was concentrated heavily in southern Michigan (King 1965, p. 3-5).

Recreational Use: Amount and Distribution

Campground use accounted for half of the total estimated man-days of recreation on the two Forests. Camper length of stay averaged 4.6 days. About 18 percent of all camping was at undeveloped spots, either within existing campgrounds but not at established units, or at lakes or streams having no developed campground. Only developed campgrounds were included in the locational analysis.

The Huron campgrounds fall in two clusters — four closely spaced sites in the western half of the Forest, and five more widely spaced sites in the east (fig. 2). The western cluster was somewhat more uniform in total man-days of use. The Manistee had about one-fourth more camping than the Huron, and had both the most- and the least-used campgrounds (fig. 3). All but three of the 13 Manistee campgrounds were located in the northern half of the Forest. The campgrounds with the greatest use were also in the north, with Sand Lake the center of the cluster and by far the most used.

Because the campgrounds varied in size, capacity had to be taken into account. Therefore figures 2 and 3 show use in terms of groups-nights per unit. (A campground with every developed unit occupied every night would equal 100 percent.) This is probably the unit of measurement most needed for resource planning.

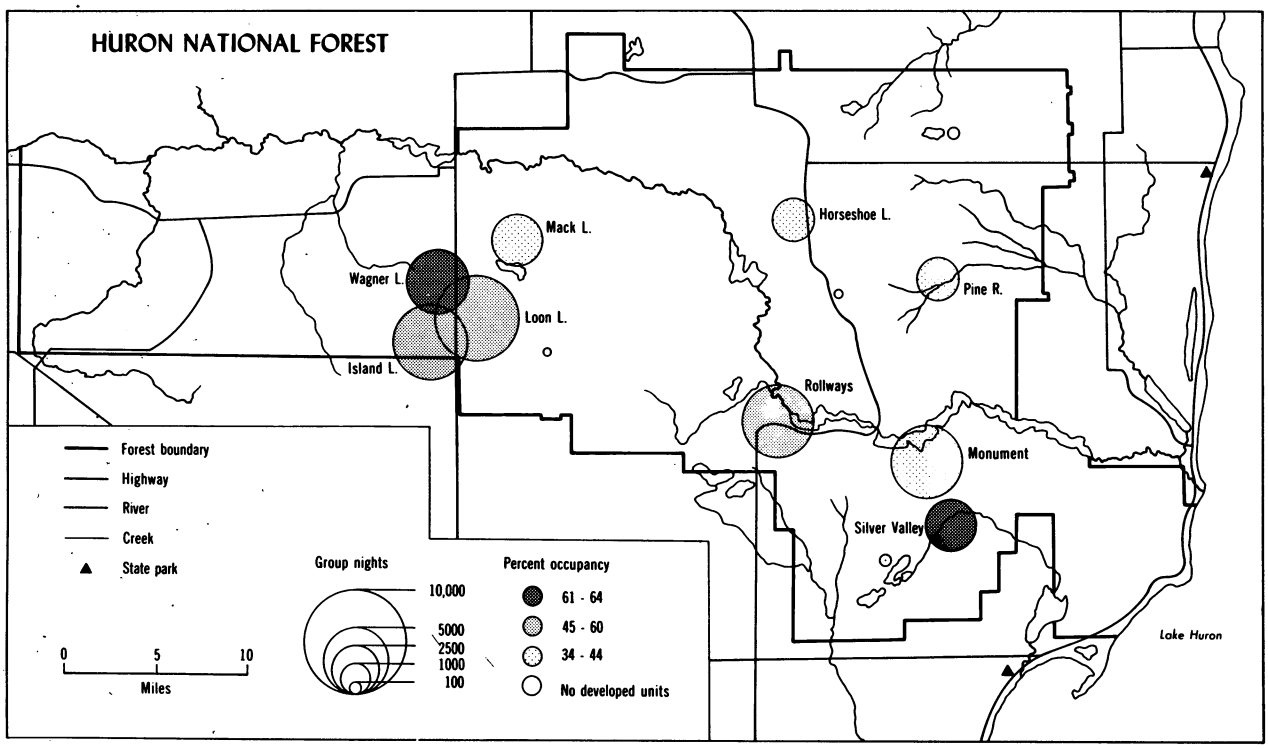

Figure 2. — Camping use, Huron National Forest, April 28-September 14, 1962.

Again, the Manistee had both more use and more variable use. Occupancy ranged from 40 to 97 percent on the Manistee compared with 34 to 64 percent on the Huron. The map shows no obvious pattern of occupancy rates. Heavily used campgrounds were found both on lakes and on streams, both along highways and in out-of-the-way places, and in the north and south.

Variables Related to Use Distribution

After examining each independent variable through simple correlations or class means, and on scatter diagrams, multiple regression was used to determine the variables useful in combination for estimating use, and how well they would estimate use.

Analysis of Variables Singly

Only one readily measured campground variable — creek location — appeared useful for estimating appeal when factors were considered singly (table 1). Use of campgrounds located near creeks averaged only 39 percent of capacity, compared to 58 to 71 percent for those near lakes or rivers.

The correlation of 0.40 (table 1) shown for the NFRS canoeing rating is somewhat misleading. There was little difference in use among outstanding, good, and fair canoeing locations; the big difference was between the places with canoeing opportunities and those without — the creek locations again.

Visitor rating of the fishing was strongly related to use — but this is difficult to apply directly in planning for new developments. The overall rating by visitors also was moderately associated with use per unit.

A few other variables were associated with use in the direction suggested by location theory (Haggett 1966) or common recreation planning assumptions, but not to any important extent: stream width, the length of beach at the site,[5] fishing quality, an im-

[5] *If only the locations with beaches are considered, the relationship is stronger. Beach quality as measured for NFRS is weakly related to use, but less than beach length. Length and quality are closely correlated ($r = 0.79$). Most of the difference on the quality rating is between places with beaches and those without, and simple presence of a beach is almost as good an estimator as quality.*

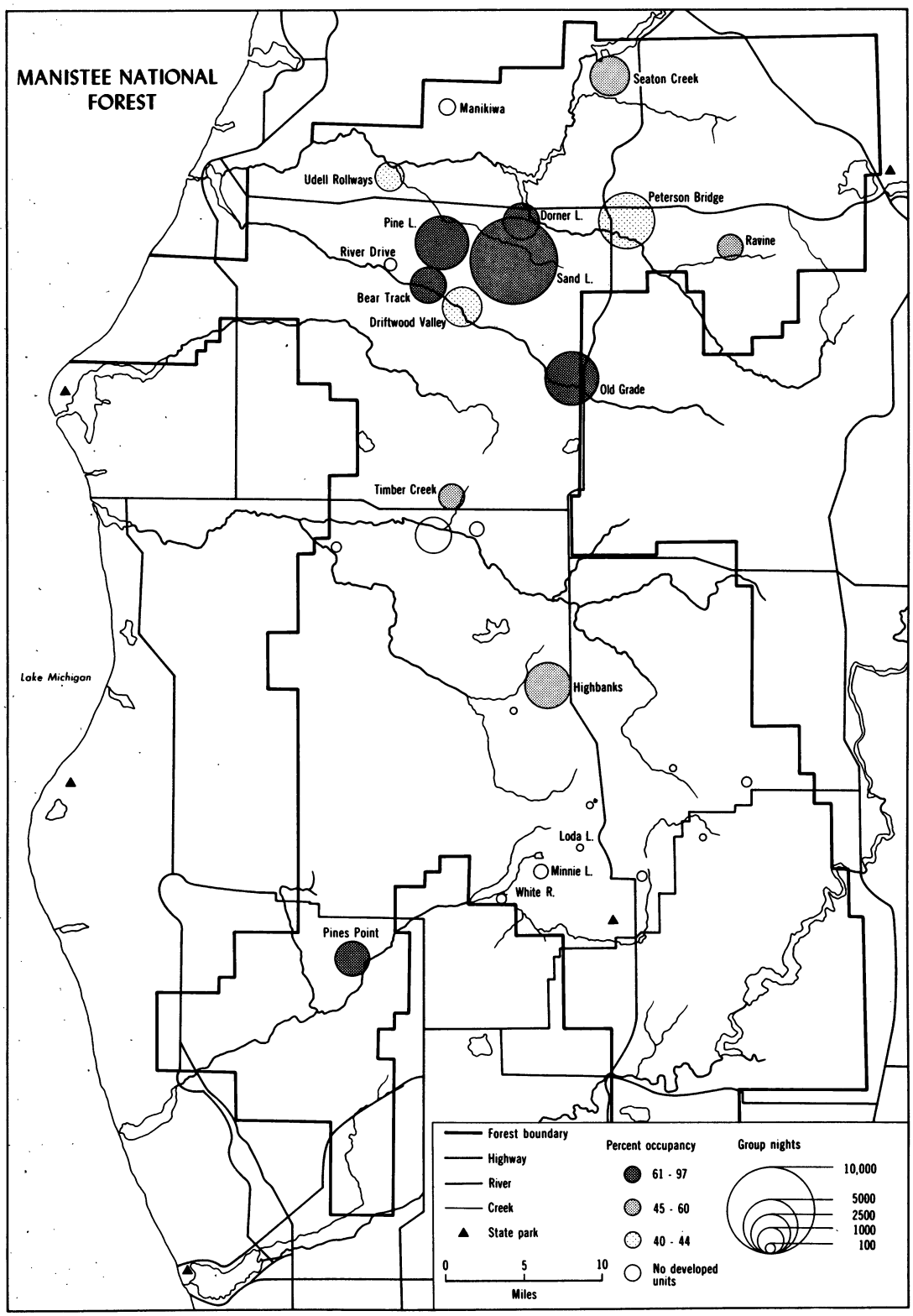

Figure 3. — Camping use, Manistee National Forest, April 28-September 14, 1962.

Table 1. — *Association of campground characteristics with group nights of camping per developed unit (22 locations)*

Characteristic	Simple correlation[1]		Average use as a percent of capacity
Physical resource features:			
Lake	--		58
Large river (boat-navigable)	--		71
Small river (canoeable)	--		66
Creek (unnavigable)	--		39
Size of lake, acres	-0.16		--
Width of stream, tenths of chains	.15		--
Size of lake or width of stream, relative to the mean for lakes or streams	-.16		--
Yards of beach	.32		--
Presence of beach	--		62
Absence of beach	--		54
Resource quality rating:[2]	Visitors'	NFRS	
Beach	.07	.24	--
Fishing	* .62	.31	--
Boating	.15	.05	--
Canoeing	.27	* .40	--
Occupancy site	.19	-.12	--
Resource composite at site	* .40	--	--
Development:			
Presence of developed boat access	--		65
Absence of developed boat access	--		52
Number of campground units	-.19		--
Huron	--		48
Manistee	--		63
Relative location:			
Distance to nearest paved road	.18		--
same, inverse (1/Distance + 1.0)[3]	-.21		--
Distance to State or Federal highway	.23		--
same, inverse (1/Distance + 1.0)	-.25		--
Distance to Flint or Grand Rapids	-.03		--
same, inverse	.07		--
same, inverse of distance squared	.09		--
Distance to Great Lakes	-.26		--
same, inverse	.18		--
Distance to nearest campground	-.23		--
same, inverse	.13		--
Average distance to three nearest Forest Service campgrounds	-.04		--
same, inverse	.21		--

1/ Pearson product-moment correlations are reported for campground characteristics measured on interval scales or on ordinal scales for which an assumption of equal intervals seemed acceptable. Average use as a percent of capacity for all campgrounds sharing a given characteristic is reported for characteristics in the form of nominal data.

2/ The higher the quality, the smaller the coded value. "Outstanding" = 1, "Good" = 3, etc., and "None" = 9. However, for ease in interpretation, signs have been reversed, so a positive correlation indicates a positive association of use and quality.

3/ The 1.0 was added because some distances were zero, which would lead to an inverse equal to infinity.

* = Significantly different from zero at 0.10 level.

proved boat access, proximity to Lake Michigan or Lake Huron, and campground clustering.

Some of the relations between independent variables and use were unexpected: lake size was negatively related to use although the range in size of lakes was small, and several small lakes had good beaches that were lacking at the large lakes; boating quality as estimated for NFRS was negatively related to use; campground size was weakly negatively related to use (except for one large, popular campground the negative correlation would have been stronger); distance to paved roads or to main highways was negatively related to use (the more accessible places were used less); and distance from the population concentrations to the south was positively related to use. Although the two Forests seem similar, the Manistee appears more attractive to campers.

Analysis of Variables in Combination

Most of the variables contributed little in accounting for use, and all but four were finally dropped from the multiple regression analysis. As a group, these four independent variables — campground size, yards of beach, type of water location, and the inverse of distance from the Great Lakes — accounted for 69

percent of the variation in use per unit[6] in the following equation:

$$Y_1 = 2.85 - 0.25X_{13} + 0.36X_{15} + 5.90X_{37} + 3.61X_{38} + 4.30X_{40} + 68.51X_{41}$$

R^2 = 0.69. Standard error of estimate of Y = 1.87 (mean of Y_1 = 7.95, standard deviation = 2.85), where

Y_1 = Estimated group nights per campground unit, in tens

X_{13} = Number of campground units

X_{15} = Yards of beach, in tens

X_{37} = Dummy variable, 1 = canoeable river location

X_{38} = Dummy variable, 1 = boat-navigable river location

X_{40} = Dummy variable, 1 = lake location (creek locations would be 0 for all three of these variables)

X_{41} = The inverse of road distance to the nearest Great Lake in miles (1/D)

The overall relationship is fairly strong, more so than for the variables singly, with an F-value larger than required for significance at the .01 level. The average discrepancy between observed and "predicted" use per unit for each campground was 17 percent. The difference exceeded 30 percent for three campgrounds (use was overpredicted) and the largest error was 53 percent.

The larger the campground, the less use per unit it received, on the average. This agrees with findings in part of the Superior National Forest (Lucas 1964) and with results from several Colorado National Forests.[7] This suggests that larger campgrounds are not necessarily more attractive because of their greater size, or because they generate more word-of-mouth advertising. It is possible, however, that the larger campgrounds are somewhat newer, and are not as well known yet.

[6] *The same variables related to* total *group nights for the 140-day season accounted for 90 percent of the variation, with number of units and yards of beach dominant in this case (these two variables alone had an* R^2 *of 0.87). The average discrepancy between observed and predicted* total *use for each campground was 15 percent.*

[7] *Personal communication with Wendell Beardsley, Intermountain Forest and Range Experiment Station, Logan, Utah.*

The type of waterbody was moderately related to use. Greatest use was indicated for canoeable rivers, followed closely by lakes, then by larger, boat-navigable rivers, with creeks far behind. These relative weights were consistent no matter what other variables were included in the equations.

The amount of beach had a strong positive relation to use. The presence or absence of a beach was less strongly related than yards of beach.

Accessibility to Great Lakes shoreline was not very important. For example, a campground 20 miles from one of the Great Lakes would be predicted to have about 2 percent more use than one 40 miles away. (Distance to the Great Lakes varied from 8 to 46 miles.) I hypothesized that campgrounds closer to the Great Lakes would have greater use, but there is doubt if a causal relationship exists. There is no way of telling from the other data collected what the role of the Great Lakes shoreline might be. I do not know if many visitors were driving the scenic routes close to the Lakes, or combining stays at State Parks on the Great Lakes with camping on the National Forests, or perhaps overflowing from State Parks.

The equation containing only campground size and length of beach accounts for 25 percent of the variation in use per unit. If type of water location is added to campground size and beach length, 48 percent of the variation in use per unit is accounted for. If water locations are classified only as "creeks" and "other," R^2 is 0.45.

The "net effects" (Cooley and Lohnes 1962) or "coefficients of separate determination" (Mills 1955) indicated the following contributions by each variable to reducing the variance in use per unit:

Variable	*Contribution to* R^2	*Percent contribution*
Type of waterbody	0.29	42.0
Yards of beach	.20	29.0
Number of CG units	.10	14.5
Inverse of Great Lakes distance	.10	14.5
Total	.69	100.0

Some of the omitted variables were weakly related in the expected direction, but a few seemed backwards in their relation to use — at least at first glance. The presence of an established boat access was associated with greater use, but in combination with the variables included in the final equation, it did not improve use estimates. Most of the NFRS quality

ratings were slightly associated positively with use. Fishing quality came the closest to making a contribution. This does not mean that resource quality is irrelevant in explaining or predicting campground use. In fact, there was an improvement in estimates when the visitors' average composite rating of each site's resources was added to the final equation. Visitors' ratings of fishing also were associated with use, but all these visitor ratings were omitted because they would not be applicable to planning for potential sites.

The effect of the distance variables based on remoteness from paved roads or State highways was weak, and actually the opposite of what I expected based on general location theories. Distance from the area's main source of visitors to the south also seemed reversed. The more distant campgrounds were used *more,* not less. (The effect was small, however.) It is doubtful if the range of 70 miles in distance between the closest and farthest places was perceived as very important by most visitors. Greater distance to the campgrounds also means "up north," because the visitors almost all live to the south (King 1965). It is possible that the appeal of the northwoods is stronger than the friction of distance within the two National Forests. The proportion of residents in each county who visit the Forests does decline with increasing distance from the study area (King 1965), but it appears that the variation in remoteness within the Forests lies below some threshold of perceived importance in terms of cost or effort. Within the Forests, distance seems to act like a lure rather than as a cost or friction as it does in most human activity. Between home and the Forest boundary, distance assumes its normal role of a cost or deterrent. The decision to make the trip to the general area apparently is made in a different frame of reference than the choice of a specific destination within the Forests. This finding of a two-level distance effect is consistent with results of an earlier study of the Superior National Forest (Lucas 1964).

The campground clustering variable added nothing to the equation's predicting ability.

Much of the difference in use between the Huron and the Manistee was apparently due to differences in campground resource features between the two Forests, judging from the small effect of a dummy variable for Forest.

Finally, the difference between observed and predicted use as a percent of observed use was mapped for any indications of overlooked effects or variables. At four campgrounds discrepancies were 25 percent or more, all overpredicted. All four of these overpredicted locations had below-average use. They have no apparent common characteristic of location, development, or resources to suggest why they are less popular than would be expected.

In summary, campground use could be fairly well predicted on the basis of a combination of physical resource features — type of water body and amount of beach — and size of development. Quality ratings, as measured, were not important, except perhaps for fishing. Distance from population concentrations or main roads seemed unimportant.

Campground use is clearly not a simple function of a few dominant characteristics. One feature apparently can offset the lack of another in a complex and variable way — for example, beaches seem to be an important attraction, but there are popular campgrounds without beaches. There seems to be no simple shortcut to forecasting the drawing power of campground sites. Useful estimates probably will need to be based on environmental features considered in combination.

It might be added that what makes a popular campground does not necessarily make a popular picnic area. Total group picnic visits and total group nights camping, in places with opportunities for both, had a correlation coefficient of 0.44, but picnic visits and camping, with both on a use *per unit* basis, were negatively associated (—0.42). (Both correlations were significant at the 0.05 level.) The variables related to picnicking use were also different than for campground use. For example, beaches were not an important factor in picnic area use. However, site quality, paved road access, and capacity were all significantly related to picnic use per unit with an R^2 in multiple regression of 0.53. A convenient, adequate place appears to be all that most people are after for such a brief, undemanding type of recreation as picnicking.

Visitor Attitudes

Some visitor attitudes are directly related to the use-distribution analysis, while others are important in relation to future use patterns and to visitor satisfaction.

General Satisfaction

The vast majority of visitors to the Huron and Manistee National Forests liked what they found very much. This high level of satisfaction may not always be recognized by administrators because the dissatisfied person is likely to complain, while the overwhelm-

Table 2. — *Campers' satisfaction related to years of National Forest camping experience*
(In percent)

Years of experience	N (weighted for length of stay bias)	Answer to question: Do you think your group will visit this location again? Yes	No	Maybe	If answer was "no" or "maybe," the group: Was not satisfied with the site	Liked the site, but felt it too hard to reach	Liked the site, but preferred to visit new areas	Other
0	259	77	3	20	2	4	11	5
1	61	83	--	17	--	--	13	4
2-4	114	88	1	11	3	--	5	4
5-9	51	94	--	6	2	--	--	4
10+	99	98	--	2	--	2	1	1
All campers	584	84	1	15	2	2	8	4

ing majority quietly enjoy the area. Recreation surveys thus can be useful in putting complaints in a more balanced, objective picture. All the sample groups were asked if they thought their group would visit that particular location again. Only 1 percent said no, and most of these were seeking new places to see rather than dissatisfied.

Camper satisfaction was directly related to years of experience in National Forest camping (table 2). This was to be expected because the person who preferred a different type of area would be unlikely to keep camping on the National Forests. Some of the newcomers were exploring and testing, and would not be back (although about three-fourths of the first-timers thought they would return).

In future research, the attitudes of these "dropouts," and perhaps all first-year visitors, could well be separated. Any specific type of recreational area will be rejected or disliked by some people because areas and people both vary. It seems misleading to give equal weight to evaluations by people who are seeking a different type of area or experience. By analogy, a Chinese restaurant would do well to ignore the opinion about the food expressed by someone who ate there by mistake while seeking an Italian restaurant.

Visitors were also asked if there was anything about the location that they especially liked or disliked. Campers liked the lack of crowding and "just everything" (table 3). The only fairly common dislikes were related to the type, condition, or absence of facilities. Picnickers were even more satisfied than campers, 78 percent voicing no dislikes.

Variation in camper experience showed little relation to likes or dislikes. Tent campers and trailer campers had similar likes, but trailer campers had somewhat more dislikes — 42 percent compared with 31 percent for tent campers. Trailer campers complained more about facilities, and 5 of 176 trailer groups complained about *lack* of crowding, compared with only 1 of 302 tent groups.

Table 3. — *Campers' likes and dislikes*
(In percent)[1]

Answer to question: Is there anything about this place you particularly like or dislike?	Likes	Dislikes
Nothing	1	66
Everything	30	*
Scenery	12	*
Lack of crowding	33	1
Beach	9	2
Fishing	4	4
Facilities	7	17
Cleanliness or dirtiness[2/]	4	4
Remote, hard to reach	1	--
Crowded	--	6

1/ Percents total more than 100 because some people gave more than one answer. N(weighted) = 593.
2/ Likes apply to cleanliness, dislikes apply to dirtiness.
* = Less than 0.5 percent.

Resources

The amount of recreational use was not closely associated with resource quality as measured in the NFRS inventory, but was associated with visitors' ratings; thus it is is apparent that NFRS resource ratings and visitors' ratings differ. Some of the differences are substantial (tables 4-8). Two-thirds of

Table 4. — *Visitors' rating of beach quality compared with NFRS rating*

NFRS rating1/	Locations2/	Visitors' rating of resource3/ Higher	Same	Lower
	Number	Percent	Percent	Percent
Outstanding	0	--	--	--
Good	4	38	48	15
Fair	6	81	18	1
Unsatisfactory	11	99	1	--
All ratings	21	68	26	6

1/ N(weighted) = 232.
2/ Number of locations at which interviews were obtained (tables 4-8).
3/ Percentages are based on group responses, corrected for length of stay bias, and only for visitors who said they had actually used the resource (tables 4-8).

Table 5. — *Visitors' rating of fishing quality compared with NFRS rating*

NFRS rating[1]	Locations	Visitors' rating of resource		
		Higher	Same	Lower
	Number	Percent	Percent	Percent
Outstanding	21	--	16	84
Good	17	11	35	54
Fair	7	39	38	23
Unsatisfactory	0	--	--	--
All ratings	45	7	26	67

1/ N(weighted) = 355.

Table 6. — *Visitors' rating of boating water quality compared with NFRS rating*

NFRS rating[1]	Locations	Visitors' rating of resource		
		Higher	Same	Lower
	Number	Percent	Percent	Percent
Outstanding	4	--	24	76
Good	16	29	54	17
Fair	12	84	1	15
Unsatisfactory	0	--	--	--
All ratings	32	28	48	24

1/ N(weighted) = 141.

Table 7. — *Visitors' rating of canoeing water quality compared with NFRS rating*

NFRS rating[1]	Locations	Visitors' rating of resource		
		Higher	Same	Lower
	Number	Percent	Percent	Percent
Outstanding	2	--	72	27
Good	9	32	24	44
Fair	0	--	--	--
Unsatisfactory	0	--	--	--
All ratings	11	15	50	35

1/ N(weighted) = 42.

Table 8. — *Visitors' rating of site quality compared with NFRS rating*

NFRS rating[1]	Locations	Visitors' rating of resource		
		Higher	Same	Lower
	Number	Percent	Percent	Percent
Outstanding	0	--	--	--
Good	39	64	33	3
Fair	9	92	8	0
Unsatisfactory	0	--	--	--
All ratings	48	67	31	2

1/ N(weighted) = 833.

the visitors gave beaches (table 4) and site quality (table 8) a higher rating than did NFRS, and two-thirds gave fishing (table 5) a lower rating.

If the places considered better by the planner are also thought to be better by the potential user, it matters little what adjective is chosen, at least if the planner is only trying to compare locations with regard to one resource. He still could make misleading evaluations of resource combinations, however. A more serious problem is presented by the visitors' reversal of NFRS ratings. This is the case with boating water ratings (table 6). Seventy-six percent of the visitors gave a lower rating to boating sites rated as outstanding by NFRS, and 84 percent gave a higher rating to sites rated only fair by NFRS.

To get a further view of the relative importance of the different resource elements, the visitors' overall site ratings were correlated with their ratings of a number of resource elements (table 9). The overall rating question was presented as referring to "the whole area all together — the surroundings, fishing water, water for boating, and so on — except the facilities." The strongest association was with the visitors' ratings of the general surroundings, or essentially "scenery." Fishing was also important. Beach quality was positively associated with overall quality, but weakly. Boating quality — as judged by visitors who said they had boated — had a slight negative association with overall site quality, for which there is no apparent explanation.

Table 9. — *Correlations of visitors' average site resource rating[1] with their average overall, composite site rating*

Type of resource	Number of locations	Correlation coefficient
Beach (places with beaches)	21	0.26
Fishing (all developed sites)	30	* .51
Boating (all developed sites)	30	-.24
Canoeing (all streams)	45	* .29
General site environment ("scenery") (all developed sites)	30	* .60

1/ Based only upon responses of visitors who used the resource element.
* = Significantly different from zero at 0.05 level.

Facilities and Layout

At least three-fourths of the campers were satisfied with every type of facility checked, and tent sites, tables, and roads scored over 90 percent approval. (Picnickers were even more satisfied with facilities.) Toilets, boat launching areas, signs, and fireplaces drew the most complaints from campers.

Table 10. — *Campers' use of facilities and reasons for nonuse*
(In percent)

Type of facility[1]	Use and evaluation of facility				
	Used	Not used: No interest	Not used: Unaccept.	Not available: Desired	Not available: Not desired
Water supply	97	3	--	--	--
Toilets	96	4	--	--	--
Tent or trailer site	92	6	*	2	--
Fireplace	71	20	*	7	2
Firewood	90	8	--	2	*
Table	85	8	--	7	*
Boat launching area[2]	27	28	*	14	32
Signs and information	99	1	--	*	*
Rentals (boats, etc.)	3	9	--	22	66
Campground roads	99	1	--	--	--
Hiking trails	40	47	--	9	4

1/ N(weighted) = 594.
2/ Data on boat launching areas are reported only for lakes and large, boat-navigable rivers. For lakes and large rivers, N(weighted) = 468.
* = Less than 0.5 percent.

Hardly any campers said that they had not used some facility because it was unsatisfactory (table 10). However, substantial numbers of campers failed to use some facility because of their lack of interest in it. About half of the campers were not interested in available hiking trails, but about two-thirds of the people at campgrounds without trails said they would like them. Except for boat ramps and rentals, missing facilities were generally desired.

More experienced campers expressed somewhat more satisfaction with toilets, fireplaces, firewood, and signs and information than those with fewer years of camping.

In general, visitors were also highly satisfied with the number of individual family units, their spacing, screening vegetation, and amount of use. Over two-thirds of the camping groups said they liked the size of the campground they were using (table 11). Thirty percent said the campground was too small, and only 2 percent said they felt it was too large. The people who felt more sites were needed may have been reacting more to difficulties in finding a spot than to the small campground environment itself. Tent campers seemed to be the type most in favor of small campgrounds. The variation in attitude among campers with different amounts of experience was small.

It appears that the campers who preferred large campgrounds usually wound up in the large campgrounds, and vice-versa. The larger the campground, the more campers who wanted it larger still (table 11). The very small campgrounds (3 to 6 units) had the most satisfied customers, and the customers with the least enthusiasm for expansion. The campers in small campgrounds (7 to 11 units) were the only ones who expressed some feeling that the campgrounds were already too big.

Spacing between campground units, which averaged about 100 feet, received 90 percent approval. Only 6 percent of the groups said the spacing was too wide, while 4 percent said it was too close. Again, tent campers (the largest group) preferred more privacy than trailer campers. One trailer camper out of seven felt too much room was left between camping spots.

Over 90 percent of the campers approved of the screening vegetation between units. Only 1 percent thought the vegetation was too dense, but 7 percent felt there was too little. Again, the trailer campers seemed to want less privacy. Attitude toward screening vegetation was not related to camping experience. Screening seems more important than spacing —

Table 11. — *Campers' opinions of the number of units in the campground, by shelter type and campground size*

Camping group characteristic	N(weighted)	Opinion of number of units: Too few	About right	Too many
		Percent	Percent	Percent
Shelter type:				
Tent	323	27	69	4
House trailer	185	34	64	1
Tent trailer	54	20	80	--
Pickup camper	7	46	54	--
Station wagon	7	54	46	--
Other	17	38	62	--
Campground size:				
Very small (8) (3-6 units)	97	22	76	2
Small (8) (7-11 units)	195	25	70	5
Medium (6) (16-22 units)	286	35	64	1
All camping groups	594	30	68	2

Table 12. — *Campers' opinions on number of units, spacing, and number of other campers by forest*
(In percent)

Forest	N(weighted)	NUMBER OF UNITS			
		Too few	About right	Too many	No opinion
Huron	257	35	65	1	--
Manistee	337	26	71	3	--
Forest	**N(weighted)**	**SPACING BETWEEN UNITS**			
		Too close	About right	Too far	No opinion
Huron	257	2	89	8	1
Manistee	337	6	91	3	--
Forest	**N(weighted)**	**NUMBER OF OTHER CAMPERS**			
		Too many	About right	O.K. with more	No opinion
Huron	250	3	73	24	--
Manistee	334	12	75	13	--

about twice as many campers wanted more screening as wanted more distance between units. The obvious physical relation between distance and screening effect may not have been recognized clearly by the visitors. Actually, as spacing gets tighter, screening probably drops at an increasing rate as trampling from one unit overlaps that from the next.

If the large number of experienced campers who were new to National Forest camping were "graduating" from State Parks, it does not appear that they were applying State Park standards to the National Forest campgrounds. Most Michigan State Park campgrounds are much larger, have more closely spaced units, and have less screening. But the campers who were new to the National Forests tended to favor small campgrounds with widely spaced units more than the oldtimers. The future effect of increasing camping experience is difficult to predict from a single study. The newcomers may shift toward the views of more experienced people as they grow older, or their views could represent a shift in taste. Future research focused on attitudes will have to cope with this problem, and repeated surveys over time seem necessary.

The Manistee campers were less inclined to favor campground enlargement and clearly preferred wide spacing of units (table 12). This may be related to the big-city origin of many of the Huron campers, which draws more from the Detroit metropolitan area. If differences like this exist between two such similar Forests, it emphasizes again the need for caution in applying study results from one area directly to another.

Recreational Use

There was no significant amount of complaining about too many people on beaches, in boats, canoes, or on fishing streams. In fact, a majority said more canoeing would have been acceptable to them.

There was some negative reaction to the number of campers (last section of table 12), especially on the Manistee, where 12 percent of the groups said the campground was too full. Part of this was because the Manistee had several campgrounds that were more fully occupied than did the Huron (figs. 2 and 3). However, Manistee campers objected to crowding of *every* type much more than Huron campers, which is consistent with the difference between the visitors' to the two Forests in terms of attitudes on campground size and spacing.

Water skiing seems to cause friction some places, but on the Huron only 5 percent of visitor groups complained about water skier numbers at campgrounds where it took place and 28 percent said they could tolerate more. The Manistee campers were a bit touchier (9 percent complained), but even here the situation does not seem bad, especially when one recalls the refuge from water skiing available at the campgrounds on small lakes and streams.

Type of shelter and years of experience in National Forest camping were both unrelated to crowding attitudes.

Sources of Information

Campers found out about the campground they were using primarily by talking with friends and acquaintances (43 percent). The same result has appeared in many other outdoor recreation studies. The

free Forest Service map-brochure (4 percent), stories by outdoor writers in newspapers or magazines (1 percent), and tourist information booths (1 percent) were no match for "a guy at the plant," "my neighbor," and so on. However, some of the press releases and maps may still be crucial as the *original* source of new information that is then dispersed through the person-to-person network. The second most common reason, however, was "drove by and dropped in" (19 percent), a sort of random search, and this is probably where most of the new knowledge comes from. Third most important were road maps (10 percent). This stresses the importance of getting all State highway and oil company maps to show public recreation sites.

Management Implications

The most obvious implication of the study is that the recreation resource management on the Huron and Manistee National Forests is doing a good job of satisfying the public. It is hard to imagine any program receiving much more complete approval than the recreational management of these areas. There are opportunities for improvement, of course, and some change and much growth will be necessary, but there seems to be no need for major shifts in design of areas or facilities, or in their operation.

Capacity and use, however, are not well balanced. A national motel chain would be concerned if some of its motels were almost full every night while others had two-thirds of their rooms empty. Too much capital would be tied up in poor producers, and too many potential customers would be turned away from the full motels. An analogous situation exists in the Huron-Manistee campgrounds. It should be added, however, that the variation in campground occupancy for these Forests was less than that reported for any of the other areas studied, perhaps due to the great accessibility and heavy use pressure in Lower Michigan.

The question of desirable campground size is not completely analogous to the motel situation, however, because it must be answered in terms of somewhat different management objectives. The larger campgrounds received less use per unit than small ones. This means that smaller campgrounds produced more recreation per unit, and maybe even more per dollar of input, depending upon the economies of scale of campground construction and operation. (One study of this question in three Colorado National Forests indicated no relationship between campground size and construction costs, and only a slight tendency for operation and maintenance costs per unit to decline as campground size increased (Beardsley 1967).) But, unlike the motel, the objective is not to get maximum use per campground unit. Too much use hastens physical deterioration, reduces freedom of choice by visitors, and also raises costs of maintenance, according to the study by Beardsley (1967). The goal is some optimum level of use, with only moderate variation from campground to campground.

It appears that the occupancy rate may be lowered somewhat by enlarging campgrounds; supply does not necessarily create its own demand in treadmill fashion. However, the problem still is one of assessing a location's attractiveness, and matching the size of the development to it.

Because of variation in peoples' desires and in areas' potentialities, diversity in campground size seems both necessary and desirable. Unless small campgrounds can be shown to be substantially more costly per man-day of use, it would appear to be a mistake to eliminate them. On the other hand, there seems to be a distinct desire for, and acceptance of larger campgrounds by most campers.

Diversity is also supported by the differences in attitudes that showed up between users of the two superficially similar Forests. Areas that look much alike may still attract rather different people. A standard pattern of development does not seem appropriate here, and even less so nationwide.

The visitors indicated no serious problem of overuse or use conflicts. If the capacity of the campgrounds keeps pace so that most campers can find a place, and if diversity of size and setting is maintained within the system, camper satisfaction with the number and types of other users should remain high.

Picnic area locations should apparently be chosen independently of campground locations. The range of possible locations for "successful" picnic areas seems much wider than for campgrounds. A reasonably attractive spot near a highway seems sufficient for most picnic areas.

A better flow of information between land managers and the public about recreational areas and opportunities seems desirable. Many people apparently wound up in the type of place they preferred, but largely without help from official Forest Service maps and brochures. More effort here could pay real dividends — the extensive person-to-person communication network can greatly multiply the transmission of knowledge distributed by the Forest Service. Better knowledge of available alternatives could produce

more uniform and efficient use, and increase public satisfaction. Information helpful in choosing a campground might include number of family units, kind of fish, size of lake, presence or absence of water skiing, navigability of streams, miles of hiking trails, and even type of water supply and toilets (some of this information is already provided). This information would require more frequent revising of maps, but it could be worth it. It would be desirable to have Forest Service recreation opportunities fully and accurately reported on highway maps; these maps were used by far more Huron-Manistee campers than were the Forest Service maps. The large number of campers who found campgrounds by just driving and looking emphasizes the importance of adequate signing.

Finally, the study results show that the expense and effort of detailed resource quality measurement seem a doubtful investment at this time. This is especially true of summary quality ratings. We do not yet know enough to measure recreation resource quality in terms meaningful to use potential. The resource data that best accounted for recreational use were usually straightforward physical resource measurements, such as yards of beach, rather than quasi-objective quality ratings. Directly measured, raw data have several advantages: First, there is little doubt about comparability. Lake size, shoreline material, slope, and tree species, for example, are fairly objective measures. Second, direct, physical data are flexible and adaptable; as knowledge about the significance of various resource elements becomes available, the data can be interpreted or scaled. This is also true for some future type of recreation as unforeseen now as water skiing was 30 years ago or as snowmobiling was 15 years ago. This adaptability is maximized by keeping data in the original units — for example, "a 114-acre lake," not "a lake between 100 and 250 acres." Such data lend themselves to later classification or combination without remeasurement. Much of this information can be recorded best on maps or map overlays, which can indicate relative location; for example, maps can show whether a sand beach is in front of a stand of big pine or across the lake in a way that even the most complex tables never can.

Future Research

Further study of the relation of recreational use to recreation area characteristics appears worthwhile. Even a modest improvement in evaluating the drawing power of recreation sites nationwide could increase efficiency enough to save millions of dollars each year for the National Forests alone. For many reasons, campground use should have top priority for future study: it is the major use at developed sites, the major investment (at least for the Forest Service), and a fixed investment.

An unanswered question relating to use measurement is the stability of use patterns from year to year. Total use may fluctuate in response to weather, but I would expect that the relative use distribution would remain about the same. (Of course, gradual changes are to be expected as roads change and new areas are built.) Past experience suggests stability, and data for Superior National Forest campgrounds for 1961 and 1967 show similar rankings in use.

Another use question, not included in this study, concerns visitor distribution *within* campgrounds. This has been studied somewhat[8] (Love 1964), and work is now in progress at the North Central Forest Experiment Station. The pulling power of the campground site as a whole and the attractiveness of units within the campground are obviously interrelated.

Campground use should be measured separately for each type of shelter, such as tent, trailer, tent trailer, motor home, and pickup camper. Some of these types of campers probably differ significantly in their evaluations of locations. For example, trailer campers stayed much closer to paved roads than other campers in the Colorado study (Beardsley 1967). It might be possible to predict each type of use better than the total use. This could also be useful in campground design because there is some variation in requirements for the various types of campers.

The most obvious location factor that appears important and was inadequately measured in this study is scenic attractiveness. Subjective expert ratings, perhaps by a panel of landscape architects, more objective measurement of elements thought to be scenically important, and interviews in depth to probe reactions to scenery should be tried and compared.

It is likely that important location factors have been overlooked. A thorough study of the location choice process is needed. We know much of the information for such choices comes from friends. What qualities do these friends notice and report? How accurate is their information? What do they distort, and how? How conscious is the location

[8] *LaPage, Wilbur F. A study of campsite selection among visitors to a small, Forest Service campground. (Unpublished report on file at Northeast. Forest Exp. Sta., Upper Darby, Pa.)*

choice? How often are places looked over and passed up? Why? How aware are people of alternatives? How are distance and travel viewed — as a cost, or as part of the fun? Study of the choice process might uncover new variables, redefine existing ones, or confirm interpretations based on relating use patterns to location characteristics.

An analytical approach, such as discriminant analysis, which could simply classify possible development sites as "below average," "average," or "above average" might be preferable to numerical use predictions. This could conform better to the realities of the complex, multifactor relationships, and avoid an impression of more precision than is warranted. Such a general classification would still be a substantial improvement in present predicting abilities and could be very helpful in resource planning.

Several key attitudes require more analysis. A recreation program that ignores quality is certain to be a failure, and efforts to better measure quality should have top priority. This will require imaginative research design, drawing upon psychology and sociology. Again, even a small improvement in knowledge could pay handsome returns in increased recreational output for the American public.

Another important attitude that still is not well understood concerns campground size. The main problem is a confusion of utilitarian and esthetic viewpoints. A camper wants to find a spot to camp when he pulls in, and he wants there to be enough units to provide one for him (and probably some to spare). He may also have some ideal size range in mind, assuming getting a space would not be a problem. But he may answer overly simplified questions about campground size from either viewpoint. The average size of public campgrounds is growing rapidly, but with little knowledge of what this implies in terms of use, quality, or economic efficiency.

Finally, recreation research needs to do much more time-series or trend analysis.[9] How are participation and attitudes changing over time, for individuals and for the public generally?

These questions must be answered if recreation resource management is ever going to aspire to do more than struggle to catch up.

[9] *The major effort of this sort has been by Wilbur LaPage of the USDA Forest Service, Northeast. Forest Exp. Sta.*

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