

Appropriate Combinations of Technology for Solving Landscape Management Problems— Session G: Recreational Development

Does the Public Notice Visual Resource Problems on the Federal Estate?¹

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Abstract: Results of the 1977 Federal estate are highlighted. The survey of recreation on the Federal estate represents a unique data set which was uniformly collected across all Federal land managing agencies and sections of the country. The on-site sampling procedures utilized in this survey process have never before been applied on such a large scale. Procedures followed and lessons learned are featured together with survey results relevant to public attraction to visual resource quality and instances of landscape degradation.

INTRODUCTION

Visual resources are more and more becoming a part of our environmental ethic, and management of these resources is moving to the forefront. This conference on our national landscape is testimony to this. Unfortunately, this rising interest comes at a time when land management budgets are spread pretty thin. The public mood of tax limitation is accentuated by galloping inflation. As a result, most public land managers are being forced to decrease their management intensity.

This situation could be particularly detrimental to the subject at hand since the nonconsumptive visual resource has historically not received as much management attention as the traditional consumptive resources such as timber, forage and water. As a result, land managers must make a case for the social value of quality visual resources. Simply to say that visual resources are more important now than ever before in this urban world in which we live might not be enough for a budget

officer with a sharp pencil. But a demonstration of how visual quality significantly enhances the recreational experience might build a convincing case for its management.

Since visual resource quality is so subjective, the attitudinal survey is a particularly appropriate tool to measure (1) the social value of quality visual resources, (2) the public's perception of the severity of visual degradation and (3) the success of the management practices to alleviate visual intrusions. As in other areas of land management practice, on-site interviews are being used more and more to accomplish these goals. Public reaction to visual quality is best measured during experiences on the resource area in question. Other approaches such as recalling an experience or reacting in the abstract to visual stimuli, such as photographs, takes the visual resource out of context with the overall experience and invites potential distortion of opinion.

SAMPLING FRAMEWORK

In 1977, information relevant to assessing landscape problems was collected by the Heritage Conservation and Recreation Service (formerly Bureau of Outdoor Recreation) as part of a national survey of people recreating on Federal lands. The Federal estate encompasses one-third of our country's total land area. The study was confined to those Federal lands within the continental United States which are managed at least in part for public outdoor recreation

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activity. A total of 155 Federal areas were included in the summer interview period with a subsample of 35 areas used for the winter and fall seasons. A substantial amount of space in this paper is devoted to describing the sampling techniques, since the conference emphasizes descriptions of techniques used to measure visual quality.

The sampling procedures utilized in this survey process have never before been applied on such a broad scale. A tremendous variety of circumstances was encountered by the 16-member survey team while conducting the personal interviews. For instance, while one interviewer was stationed at a trail head in the Bitterroot Wilderness Area managed by the U.S. Forest Service in Idaho, another was interviewing at New York City Gateway managed by the National Park Service.

Extreme climatic conditions were experienced over the three seasons and sections of the country but, because of the flexibility of the on-site sampling scheme, few days were lost due to inclement weather. Very high response rates were experienced at most areas. The overall response rate was 95.2 percent.

The effectiveness of surveys for assessing public awareness and perception of visual resource values and problems depends largely on the accuracy of the sampling scheme used to select respondents. Testing showed the 1977 national sample of recreators on the Federal estate to be well within conventional standards of confidence (95 percent confidence interval)^{3/}. Not enough interviews were collected at most areas, however, to allow for precise comparison between areas. The lessons learned from putting the sampling procedures to such an extreme test should be most helpful to land managers planning on-site surveys.

In order to draw a representative sample of recreation on the Federal estate, a random multistage probability system was employed. The first step required a scheme to choose specific management areas where the interviewing would take place, and the second step required a scheme for choosing respondents on the designated sites. The discrete land management units were stratified by sections of the country and administering agency, e.g., national parks for the National Park Service and national forests for the U.S. Forest Service. For analytic purposes, most of the areas were selected

from the three largest providers of public recreation, i.e., National Park Service, U.S. Forest Service, and the U.S. Army Corps of Engineers. The number of areas chosen for the other four land managing agencies (U.S. Fish and Wildlife Service, Bureau of Land Management, Bureau of Reclamation, and the Tennessee Valley Authority) was proportional to their annual visitation figures.

Within each Federal agency, land areas were then chosen at random with probabilities proportional to official yearly visitation statistics after first being certified as to the 10 Federal regions. Thus, a park with 2 million visitors annually had twice the chance of being chosen at random than a park with 1 million visitors annually. The use of systematic random sampling techniques with lists stratified by visitation and region ensured that the final sample of areas would be maximally representative of these characteristics in the population.

Once the list of areas was procured, an itinerary was drawn for each member of the survey team which established the order of interviewing and the number of days spent interviewing at each area. The interview time spent per area ranged from 4 to 18 days and reflected the relative annual visitation figures. The order of the summer itineraries was designed to ensure that all sections of the country would be visited more than once during the summer.

The next stage of the sample scheme was to select respondents on the designated areas. The primary objective of the on-site sampling scheme was to collect interviews which accurately reflected the array of recreators utilizing the area. Another primary consideration was to interview people who had been recreating in the area long enough to offer opinions about operation and maintenance of facilities at the area. The roadside interview at exit points common to all area recreators was considered to provide the most accurate results to this end.

In order to facilitate the above concerns, the typical sampling plan during fair weather consisted primarily of roadside interviews along exit routes during hours in which recreators were commonly leaving the area. During fair weather, periods when few recreators were leaving the area, interviews were conducted at sample points where recreation activity was likely to be concentrated: scenic overlooks, visitor centers, beaches, boat launches, trail heads, picnic areas and campgrounds. Time spent at all these sample points was approximately proportional to the percent of total area use occurring there.

^{3/} Complete documentation of survey method and analysis is soon to be published by the Heritage Conservation and Recreation Service, Pension Building, Washington, D.C. 20243.

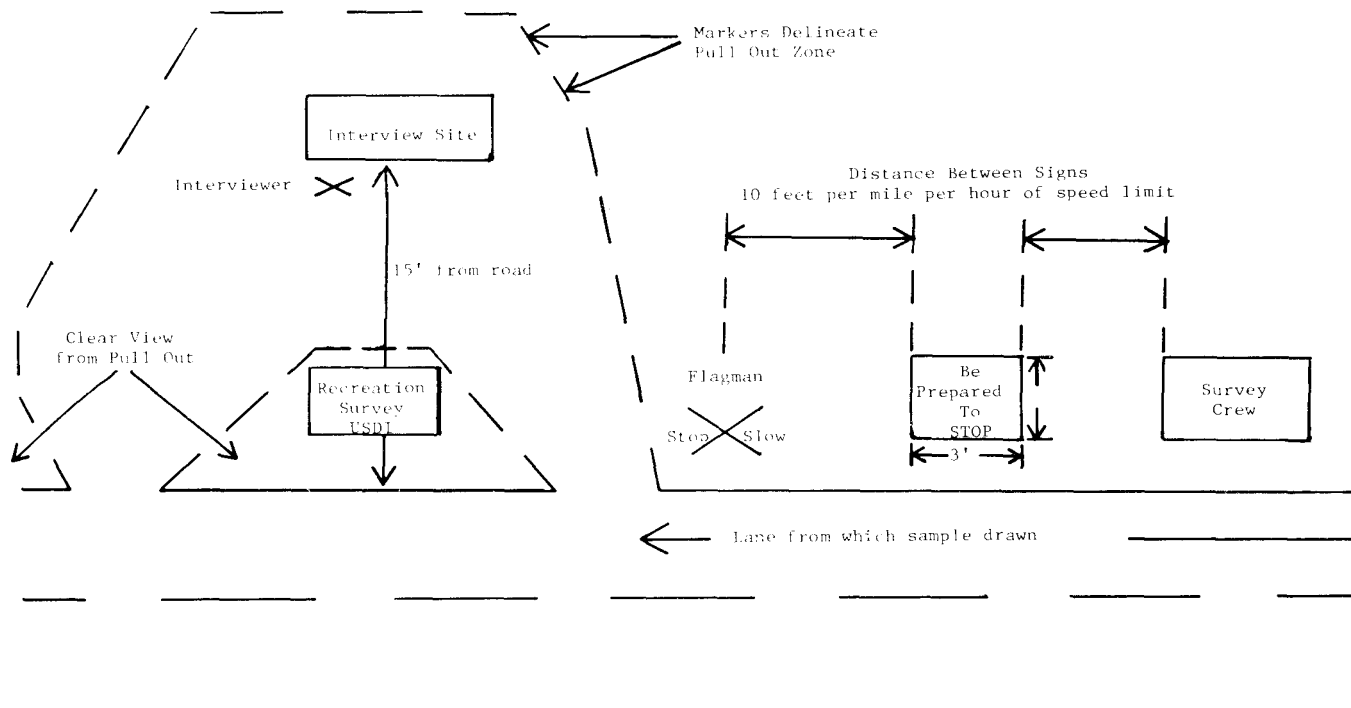


Figure 1--Roadside interviewing layout

A typical area, for example, might have three major access roads and four special facility areas such as a beach, boat launch, camp and picnic ground. If good weather prevailed for the duration of a 4-day interview period at this type of area, the interviewer would probably spend one morning at each of the four special facility areas (assuming each had a similar amount of visitation) and the four afternoons at safe locations along exit lanes of the three access roads. This assumes little morning traffic and equal recreation traffic volume on each access road. In cases where there were many more access roads or recreation facilities than there was time for them to be utilized, an attempt was made to devise as representative a sample as possible under the circumstances.

Figure 1 is a diagram of how a typical roadside setup was conducted. The potential respondent driving down the road first saw the "Slow" sign followed by the "Survey Crew" sign. Then an agency helper holding the "Slow/Stop" sign directed the vehicle either on past or into a special lane that was off the road and delineated by traffic cones. The interviewer stopped the vehicle within view of the "Recreation Survey" sign, proceeded to choose a respondent and conducted the interview. At that point, the designated vehicle had pulled well off the road. Notice the distances provided which are all important safety factors. In many states, permits have to be obtained

for altering traffic flow. The survey team members had to rehearse consistently the procedures designed to maximize safety. Because the survey team could not be supervised closely, this took personal conviction on the part of the interviewers. Thousands of people were stopped along roadsides without any accidents.

The general procedure for choosing a sample point at locations of concentrated activity (other than the roadside situation) called for the interviewers to position themselves at different points for each hour on the location. For instance, a beach scheduled as a 3-hour interviewing location might be divided mentally into three sections: where swimming was concentrated, where sunbathing was concentrated and where people strolled along the water's edge looking for shells. In the case of a campground, the area might be divided by loop drives or proximity to a scenic focal point.

The method for choosing a respondent once the interviewer was positioned on site was simply to approach the nearest person 12 years of age or older, or, when at a roadside, to stop the first car. If the nearest person was in a group, each member was assigned a number counting from left to right. For vehicles carrying more than one person, numbers were assigned to occupants from left to right as one faced toward the front of the vehicle, and front to back. The respondent was then chosen from the group according to a number from the

random numbers table. Only one person was interviewed per group.

During inclement weather, alternative sampling points were available which provided adequate shelter from the elements for both the respondent and the interviewer. Appropriate facilities might include visitor centers, field offices, ranger stations, maintenance garages, or picnic shelters. When possible, facilities used were those where recreators would normally stop and visit, such as a visitor center. When no other alternatives were available, people would be asked to pull off the road and come inside to be interviewed. This approach was, of course, only applicable during relatively mild weather disturbances.

In all sampling circumstances, once on a sampling location, the interviewer would talk to as many people as possible. As soon as one interview was completed, another respondent outside the group associated with the previous respondent was immediately approached, using the described techniques.

The Federal estate survey was conducted by a team of 16 people employed by the Bureau of Outdoor Recreation. A week-long training session was held at the Smoky Mountain National Park to familiarize the team with the detailed procedures for choosing respondents and conducting the interviews. Once the formal instructional period was complete, each member of the survey team was given multiple opportunities to practice the sampling and interviewing techniques, first to other team members and then to the general public. Each practice interview, conducted at various roadside setups and facility developments, was critiqued by the survey coordinator and/or other members of the survey team.

Directions to the survey team could only be expressed as general principles or guidelines for devising specific sampling schemes. The directions could not be completely specific since each area had unique facilities and fluctuating use patterns. Obviously, personnel who developed the on-site procedures gained a thorough knowledge of the recreation facilities available and the recreational use patterns at each area. A checklist of information collected for each area was as follows:

1. Concentrated recreation activity--
type of activity/location/facilities/percent of total visitation/
times of peak activity.
2. Overall recreation use patterns--
type of activity/location/percent
total visitation/times of peak
activity.
3. Access roads carrying recreation
traffic--associated recreation
facilities/time of peak exit
traffic/relative volume of
traffic flow.
4. Suitable roadside interview
sites along the access roads.

Cooperation by managing agency personnel was very good. A substantial amount of their time was needed to convey information necessary to establish the sampling schedule. Agency personnel also helped control traffic and guide the interviewers to selected sample points.

The survey attempted to strike a good balance between principle and practice in order to develop a data base worthy of the survey's purpose and scope. Costs per interview for various aspects of the 1977 Federal Estate Survey process were as follows: \$.22 to train interviewers, \$7.28 to conduct interview, \$3.64 to code and analyze data, and \$1.82 to report the findings.

The multistaged sampling design used in this survey was considered to be a self-weighted data base. The questionnaires were weighted to total population distribution because: (1) areas were chosen in proportion to their annual visitation, (2) more interviewing time was spent at areas with higher visitation and (3) time spent at sampling points for each area was proportional to the percent of total area use occurring there.

In order to test the reliability of the self-weighted sample, two alternative weighting schemes were applied to the data: (1) by the number of people passing the sample point at the time of the interview period and (2) by the total reported visitation for an area during the total number of days of interviewing. A portion of the sensitivity analysis comparing the self-weighted data with these two weighting schemes is shown in Table 1.

The single greatest statistical divergence between roadside and on-site interviews was for the expressed participation in sightseeing (11 percentage points difference). This is one of the few elements which might have logically varied due to the fact that sightseeing is closely associated with vehicular traffic.

FINDINGS

Discussion of survey results presented in this paper is strictly limited to those results directly relevant to assessing visual quality. The key questions in the 1977 Federal Estate Survey relevant to visual resource assessment were as follows:

1. Why did you choose to pursue these activities (identified from response to a previous question) at this area?

2. Have you been satisfied with your experiences during this visit to the area? Why not?
3. What improvements would you like to see made at the area?

Any reference to scenic beauty or visual degradation in the response to these open-ended questions was offered voluntarily by the respondents. No questions were asked which directly solicited public reaction to a specific visual resource condition.

The people who did cite visual resources in their response to these three questions were aware of the visual quality of the landscape. Managers of visual resources should be particularly interested in those recognizing visual degradation. These people provide important insight into the perception of visual resource problems. What appears as a serious visual degradation to a resource specialist may or may not concern the recreator. This perspective would be most helpful to the manager when balancing his financial and human resources between

visual resources needs and other aspects of land management. It is, of course, inappropriate to take survey results too literally and make management choices according to their popularity.

Attraction for Scenic Beauty

Scenic beauty was cited by 1 in 5 Federal estate recreators as the reason for visiting an area. As shown in Table 2, visitors to National Forests were more likely to mention scenic beauty (24 percent) than those visiting areas managed by the National Park Service (18 percent). However, 25 percent of the visitors to major vacation-oriented National Parks (a subset generated from the Park Service sample) indicated scenic beauty was the main reason for their visit. Also, scenic beauty was cited more often (10 percentage points) in the western than the eastern regions of the United States. Three other categories of response to the reason-for-visit question which may have masked scenic quality elements were as follows: "repeat visit" (26 percent), "see specific object" (5 percent) and "group trip" (9 percent).

Table 1--Alternative weighting schemes for Federal estate data
(figures given in percentages)

Sample Question	Response Category	People Weighted ^{1/}	Property Weighted ^{2/}	Self Weight ^{3/}
What is your age?	12-17 years	9	10	10
	18-24	17	15	17
	25-34	26	25	25
	35-44	20	19	19
	45-54	13	13	13
	55-64	9	9	9
	65+	6	6	6
How many years of education have you completed?	1- 8 years	8	8	9
	9-12	46	46	48
	13-16	35	34	33
	17+	11	12	10
Are you satisfied with your experiences here?	Yes	82	83	82
	No	3	5	4
	No opinion, just entered area	15	12	14

^{1/} Weighted by number of people passing the sample point during interview period.

^{2/} Weighted by total reported visitation at the area during the interviewing period.

^{3/} Reflects survey design and is used for all data presented in this paper. In this case, no weighting factor is applied to the data.

Note: Sixteen percent of those adults with up to 8 years of education chose to visit a Federal area due to scenic beauty.

Table 2--Reasons for choosing to visit
a Federal area for recreation
(figures given in percentages)

	Reason for Choosing Area	
	Facilities	Scenery
Managing agency of area:		
National Park Service	11	19
U.S. Forest Service	18	24
Fish & Wildlife	29	13
Corps of Engineers	33	15
Education of those at least 18 years old:		
Up to 8 years	30	16
9, 10, 11 years	27	16
12 years	22	18
13, 14, 15 years	20	20
16 years	17	22
17 and over	16	21

The most striking socioeconomic relationship was comparing education level with the reason for visiting an area. As displayed in Table 2, the higher the level of education achieved, the more likely that "scenic beauty" and the less likely that "good facilities" were offered as the reasons for choosing the area visited.

Dissatisfaction With Visual Degradation

An overwhelming majority of the recreators on the Federal estate were satisfied with their experiences. Of those expressing dissatisfaction, 1 in 10 was concerned with the appearance of the area (table 3). For the 11,549 interviewed during the summer survey season, only 50 people expressed dissatisfaction due to the area is ance and 11 of those were from one area. The response rate was too small to make socioeconomic comparisons.

These results should not necessarily be interpreted to mean that there are no visual resource problems on the Federal estate. Neither does it indicate public acceptance of existing visual resource conditions on the Federal estate. Different types of questions would have to be asked to measure public reaction to the condition of specific visual resources. What it does indicate is that few were dissatisfied with their entire recreational experience due to visual degradation of the landscape. An additional note of caution in interpreting the results is that the question dealt only in absolute terms. The degree of satisfaction versus dissatisfaction was not expressed.

Suggestions for Improvements of Visual Resources

Another way of assessing discontent with visual resources of the Federal estate was to study suggested improvements relating to ungrad-

Table 3--Dissatisfaction with recreation experiences
on the Federal estate (figures given in percentages)

	Entire Federal Estate Population	Federal Estate Agencies			
		NPS	USFS	COE	FWS
Percent dissatisfied	5	3	6	6	11
Percent of dissatisfied users citing following reasons:					
Facilities	56	47	53	59	69
Appearance	10	11	9	10	8
Unruly visitors	7	3	9	8	6
Too expensive	2	3	2	2	2

Note: Dissatisfaction question not asked if respondent was just entering the area.

ing visual quality. As displayed in Table 4, more than one-half of the suggested improvements relate to facilities. People are more likely to offer opinions on facilities than the landscape. This may be due in part to the fact that the majority of recreation activities involves some type of facility. No significant correlation existed between activity participation or socioeconomic characteristics and suggested improvements in the national environment and, therefore, does not help in predicting who is the most likely to be concerned about visual degradation.

Suggestions for improving the natural environment relate primarily to visual quality and are more frequently mentioned at areas managed by the Cor^s of Engineers and U.S. Fish and Wildlife Service. Visitors to Corps of Engineers areas in Texas were the most likely to suggest improving the natural environment (10 to 30 percent). Examples of specific suggestions are provided in Table 5. Recreators living near the area visited are more likely than those driving farther distances to suggest improvements on the natural environment. Also, the more times people visit an area, the more likely they are to cite improvements in the natural environment. Therefore, areas with a large percentage of local and repeat

visitors seem to be more likely to have a degraded scenic quality.

CONCLUSION

Results of the 1977 Federal Estate Survey suggest that scenic beauty is an important drawing card for recreational activity. A vast majority of visitors are generally satisfied with their recreational experiences. Only a few express overall dissatisfaction with their recreational experiences due to visual degradation of the landscape. On the other hand, apparently 1 in 10 suggests improving the natural environment of the Federal estate.

The methodology to conduct this type of effort is generally transferable to area managers. Key skills which should be centralized are the training of interviewers and the analysis and detailed interpretation of results. The principles followed in the sampling design are applicable to any area. The primary critical element up to the discretion of the land manager is the desired reliability of response. The relationship between cost of data procurement versus the value of precise reliability must be carefully studied.

Table 4--Suggested improvements on the Federal estate
(figures presented in percentages)

Suggested Improvements	Entire Federal Estate Population	Federal Estate Agencies			
		NPS	USFS	COE	FWS
Leave area as is: no improvement necessary	41	48	40	34	39
Increase type and/or number of facilities	38	29	39	46	39
Maintenance of area	7	5	9	7	10
Improve natural environment	8	5	5	13	13
Improve signs	2	3	4	1	2
Limit number of visitors	1	2	1	1	*
Improve policing of area	3	2	5	3	1
Fewer rules and regulations	1	1	1	1	2
Provide more information to visitors	1	2	1	*	1
Dissatisfied with fee structure	1	1	1	*	1

Note: Questions not asked of people just entering the area.
* = less than .5 percentage points.

Table 5--Improvements suggested for selected Federal estate areas

Agency	Name of Area
<u>National Park Service</u> Cut shrubs that obstruct view Clean up the cans upriver Too much trash, clean up area Open up more scenic area to vehicle access Clean litter in canals and bays Better identification of natural features Limit commercialism on outskirts of park Make people bring back garbage instead of burying it because the water rises and uncovers it. Bike lanes where you can see the canyon Identification of what you are seeing from the various overlooks Cleaner beach	Acadia N.P. Amestad N.R.A. C & O Canal N.H.P. Dinosaur N.M. Everglades N.P. Glacier N.P. Glacier N.P. Glen Canyon N.R.A. Grand Canyon N.P. Great Smoky Mtns. N.P. Indiana Dunes N.S.
<u>U.S. Forest Service</u> Clean up forest area near the roads and save the pine trees from dying Better public education of campers/picnickers to take pride in this area Eliminate clear cutting from the forest Trim dying trees and selective timber cutting Understory cut back near water Cut dead trees on the beach and the large white pine in center of beach Litter at Jefferson Lake	Bridge - Teton N.F. Coronado N.F. Florida N.F.'s. Galletin N.F. Mississippi N.F. Nicolet N.F. Pike N.F.
<u>Corps of Engineers</u> Would like to see it kept as wild as possible Keep water level stabilized Demolish concrete beach and replace it with sand Get stumps out of water Place has been overdeveloped	Allegheney River System Arkabuta Lake Beaver Lake Benhook Lake Canton Lake