NORTH CENTRAL FOREST EXPERIMENT STATION

Research Note NC-264

1992 FOLWELL AVE. ST. PAUL, MN 55108 FOREST SERVICE-U.S.D.A.

1981

ON-SITE SOCIAL SURVEYS AND THE DETERMINATION OF SOCIAL CARRYING CAPACITY IN WILDLAND RECREATION MANAGEMENT[1]

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ABSTRACT.—It has been suggested that on-site surveys of users fail to measure crowding accurately because long time users who knew the area before the "crowds" came tend to feel the most crowded, and thus do not return. Such "displaced" users would not be included in current on-site survey samples. Results from a limited test at the Sylvania Recreation Area in Michigan do not support this "displacement thesis." However, further research is needed in other settings to test this hypothesis more fully.

KEY WORDS: Wilderness areas, social carrying capacity, social surveys, displacement, crowding.

As use continues to intensify in backcountry recreation areas, wildland managers are under increasing pressure to establish user limitation levels, or "carrying capacities," and somehow to arrive at and justify these levels through objective analysis. "Social carrying capacity" commonly is defined as that aspect of total carrying capacity concerned with the number of other people users can tolerate and still maintain a quality experience.

Numerous studies of social carrying capacity have pointed to the weak relation between perceived crowding and satisfaction (Heberlein 1977, Randal 1977, Shelby and Nielson 1975, Lee 1975). Heberlein (1977) suggested two important processes which may contribute to this weak relation. First, old time users who knew an area before the "crowds" came tend to feel the most crowded, and thus do not return. Since these sensitive past users are no longer in the area, current on-site social surveys cannot measure their dissatisfaction. Second, many of the current users are there for the first time and have no previous experience with the area. Therefore, they tend to accept whatever level of density they experience as normal. For the purpose of discussion, we will call these two processes the "displacement effect" and the "uninitiated newcomer effect." Heberlein suggests that, as a result of these two processes, indicators from on-site social surveys will show continued high levels of satisfaction and unconcern about overcrowding as actual use and density continue to increase. Heberlein indicates that these dynamics invalidate on-site social surveys of perceived crowding and satisfaction. But do the "displacement effect" and the "uninitiated newcomer effect" really exist, or are they pronounced enough to invalidate on-site survey measures?

[1]*This research was funded by the North Central Forest Experiment Station, USDA Forest Service.*

There is some empirical evidence supporting the "uninitiated newcomer effect" (Vaske *et al.* 1980, Nielson *et al.* 1977). However, there is no direct evidence available regarding the displacement thesis. Heberlein and co-workers have provided indirect evidence that the displacement phenomenon may exist. In a study of the Apostle Islands they found early users of the area perceived more environmental damage and viewed increases in the number of users negatively (Vaske *et al.* 1980). There was no measure of actual displacement from the area, but researchers did find certain islands were avoided by long term users who perceived more crowding. Similar "avoidance" behavior was noted in a study of Bois Brule River users (Heberlein and Vaske 1977). While this evidence is suggestive, avoidance behavior within an area is different than complete displacement and does not constitute a direct test of the displacement thesis. This paper reports one attempt to directly measure the displacement thesis in a study of backcountry users at the Sylvania Recreation Area in the Ottawa National Forest in Michigan.

STUDY METHODS

The study is composed of two surveys. The first survey was an on-site survey of users conducted in the summer of 1978. The second was a phone survey of past users of the area. Each of these surveys was used to test the above hypotheses in different ways.

In the on-site survey, a sample of 321 backcountry campers were interviewed at the Sylvania Recreation Area during July and August of 1978. Interviews were conducted during the morning and afternoon. One of these two time frames was selected randomly for each day of the 2 month period except Wednesday. A 100 percent sample was taken during each randomly selected time frame. Interviewers were placed at the two major access points (Clark Lake and Crooked Lake) to interview campers as they returned from their backcountry trips. A proportional sample also was selected from the registration cards of people who camped on Whitefish Lake, an area which has a separate remote access point that is not used frequently. These users were interviewed by phone within 10 days after their trip.

On-site surveys of current users would not be sufficient to test Heberlein's theories. Thus, a major part of this study consists of a phone survey of past users of the area. From the registration cards from the 1973 season, a random sample of users was selected. Extensive efforts were made to locate anyone who had moved. Out of a total sample of 520 persons, 301 (57 percent) were interviewed. Of the remaining 219 persons, 168 (32.2 percent) had no phone or could not be located, and 49 (9.4 percent) were located but could not be reached. There were two refusals (0.4 percent).

THE STUDY AREA

The Sylvania area is managed as a multiple use backcountry recreation area by the U.S. Forest Service. It currently is proposed for wilderness designation in the RARE II proposals by the Forest Service. This 20,000 acre backcountry is a unique area with very clear oligotrophic northern lakes. Use is limited in the backcountry to 87 designated sites. These sites are developed with latrines to insure minimum impact on the water quality. With these technological improvements, social carrying capacity is a more restrictive factor than ecological carrying capacity in the area.

We should note that the Sylvania Recreation Area may be a special case for testing the displacement thesis. Although we can distinguish early users from newcomers there, the time span involved is shorter than in many backcountry areas, since the Sylvania area was established in 1968. The displacement thesis thus needs further testing in areas with a longer history of use.

We asked in what years (1967-1978) individuals had visited the area, which permitted us to categorize users into various temporal user types. "Old timer dropouts" were defined as persons who came to the area in 1973 and at least one previous year, but who had not returned in the last 5 years. "One timers" were defined as those who came in 1973 only and had not come either before or since that year. "Recent regulars" were defined as those who came in 1973, 1974, and at least 1 year since then. "Long time regulars" were defined as persons taking at least one trip before 1973, during 1973 and 1974, and one trip between 1975 and 1978.

We asked "old timer dropouts" and "one timers" who had not returned to the area their reasons for not coming back. The responses were put into categories including "overcrowding." This allowed us to assess the importance of crowding as a reason for not returning in relation to other factors. A direct question also was asked of all respondents about overcrowding during the 1973 trip. This question was: "During your 1973 trip(s) would you say the backcountry was 'very overcrowded,' 'somewhat overcrowded,' 'not crowded,' or 'don't know'?"

Since we were asking people to remember events from 5 years ago, recall accuracy might have been a problem. Thus, we attempted to measure recall accuracy on some aspects to see how much this might affect results. We knew that all respondents had

come in 1973, but when we called these individuals we said only that we were interviewing "past" users. We then asked what years they had visited Sylvania and checked to see if they accurately recalled their 1973 visit. Sixty-five percent of the respondents remembered the exact year of their visit, while 89 percent remembered within 1 year of the correct year. Thus, while there may be some distortion due to recall problems, recall accuracy was fairly good, at least to the extent we were able to measure it.

RESULTS

If Heberlein's notions about the "displacement effect" and the "uninitiated newcomer effect" are correct, we should expect the following:

1. Old timer dropouts should have felt more overcrowded than other users.
2. Newcomers should feel less crowded than old timers.
3. Persons who have not revisited the area since 1973 should tend to list overcrowding as the most important reason for not returning.

Table 1 presents data to test the first two expectations from the phone survey of 1973 users. The two newcomer types, the "one timer" and the "recent regular," showed a slight tendency to be bothered less by crowding than did the two types of old timers. However, the precentage differences are small and are not significant statistically. In comparing the two types of old timers, we found the regulars (those who came before and after 1973) felt more crowded in 1973 than did the old time dropouts (table 2). Contrary to what we expected from the displacement thesis, old timers who came back after 1973 actually felt more crowded in 1973 than old timers who did not return. In conclusion, there are no sharp differences between "old time dropouts" and "uninitiated newcomers" in their perception of crowding, and perception of crowding is not associated with old time users dropping out.

These findings from the phone survey of 1973 users are valuable because they reflect the attitudes of those who did not return after 1973. However, one drawback of the 1973 data is that the use levels during that year were quite low, therefore, the proportion of persons feeling crowded also was low. In the survey of 1973 users, only 11.5 percent of the sample felt crowded. The displacement phenomena may occur only at higher densities where more users feel crowded. That is, there may be a threshold of crowding beyond which the displacement process becomes more pronounced.

Table 1.—*Perception of crowding by temporal user type (from the phone survey of 1973 users)*

Temporal user type[1]	Perception of crowding: Over-crowded	Not over-crowded	Don't know	Total
One timer	(7)	(81)	(0)	(88)
	8%	92%	0%	100%
Old timer dropout	(3)	(24)	(0)	(27)
	11%	88.9%	0%	100%
Long time regular	(8)	(43)	(0)	(51)
	15%	84%	0%	100%
Recent regular	(5)	(40)	(1)	(46)
	10.8%	87%	2.2%	100%
Other	(6)	(60)	(1)	(67)
	8.9%	86.9%	1.4%	100%

[1]Definition of Categories: "One Timer"—1973 only; "Old Timer Dropout"—1973 and at least one previous year; "Long Time Regular"—at least one trip before 1973, during 1973, 1974, and one trip between 1975 and present; "Recent Regular"—at least one trip each in 1973 and 1974, and one trip between 1975 and present.

Table 2.—*Reasons for not returning by perception of crowding*

Reasons for not returning[1]	Perception of crowding: Crowded	Not crowded	Total
No time	(2)	(26)	(28)
	16.7%	21.7%	21%
Crowding	(1)	(1)	(2)
	8.3%	0.8%	1.5%
Litter	(0)	(1)	(1)
	0%	0.8%	0.8%
Moved farther away	(1)	(4)	(5)
	8.3%	3.3%	3.8%
New children in family	(0)	(14)	(14)
	0%	11.7%	10.6%
Gone elsewhere for recreation	(4)	(45)	(49)
	33.3%	37.5%	37.1%
Other	(4)	(29)	(33)
	33.3%	24%	25%
Total	(12)	(120)	(132)
	100%	100%	100%

[1]Includes both One Timers and Old Timer Dropouts.

We can test this partially from the on-site survey of 1978 users. In the on-site survey of 1978 users, densities were higher and more people felt crowded (22.1 percent). The 1978 survey data does not allow us to detect directly those who did not return after 1978. However, we do have a surrogate measure. Respondents were asked whether they planned to return to

the Sylvania area in the next 5 years. While this does not predict behavior precisely, a vast majority of respondents had definite future plans. Only two (0.6 percent) respondents answered the question "don't know."

Table 3 presents the results for the relation between crowding and intent to return. The displacement thesis would predict those who felt crowded would be less likely to say they would return. Here again the data do not support the displacement thesis. There is no relation between feeling crowded and the intent to return. Very few persons plan not to come back. Of those who felt crowded, the vast majority still plan to return, suggesting that crowding will not create further displacement. This further refutes the displacement thesis and possibly expands it to somewhat higher density levels.

Table 3.—*Relation between perceived crowding and intention to return to Sylvania (from the on-site survey of 1978 users)*

Intention to return or not to return to Sylvania	Perception of crowding		
	Crowded	Not crowded	Total
Definitely will return	(54)	(190)	(244)
	77.1%	76.9%	77.0%
Might return	(14)	(53)	(67)
	20.0%	21.5%	21.1%
Probably won't return	(1)	(2)	(3)
	1.4%	0.8%	0.9%
Definitely won't return	(1)	(0)	(1)
	1.4%	0%	0.3%
Don't know	(0)	(2)	(2)
	0%	0.8%	0.6%
Total	(70)	(247)	(317)
	100%	100%	100%

IMPLICATION

This study found that, at the Sylvania Recreation Area, older users who have not returned to the area since 1973 do not have siginficantly greater perceptions of crowding than other users, and that newcomers in 1973 did not feel significantly less crowded than older users. Persons who did drop out, did not do so because of crowding. These findings were supported from results of the 1978 survey which involved higher densities and a greater degree of perceived crowding.

We must, of course, be cautious in generalizing these findings. It is possible the dynamics Heberlein identifies may be present in other areas or at still higher levels of use. The displacement thesis should be tested in other areas, especially those with higher densities and longer histories of use. What may emerge from these cumulative findings from different areas, are hypotheses about conditions under which the displacement phenomenon will be more or less pronounced.

Rather than abandoning social survey measures of social carrying capacity, perhaps the results need only be used more sensitively. For instance, where surveys show great variability in perception of crowding, establishing a single uniform carrying capacity may not be advisable, especially where the "uninitiated newcomer effect" may raise average capacity. Rather, managers should think in terms of establishing "variable use level capacities" through spatial or temporal zoning. In situations where the displacement phenomena may be more pronounced, the extent of "old timer dropout" concern about crowding should be assessed and incorporated to help determine low density zones.

LITERATURE CITED

Heberlein, T. A. 1977. Density, crowding, and satisfaction: sociological studies for determining carrying capacities. *In* River recreation management and research symposium Proceedings. U.S. Department of Agriculture Forest Service, General Technical Report NC-28. p. 67-76. U.S. Department of Agriculture Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota.

Heberlein, T. A., and J. J. Vaske. 1977. Crowding and visitor conflict on the Bois Brule River. Technical Report, Office of Water Resources Project #A-006-WAS. The University of Wisconsin-Madison.

Lee, R. 1975. The management of the human components in the Yosemite National Park ecosystem. 134 p. College of Natural Resources, University of California, Berkeley.

Nielson, J. M., B. Shelby, and J. E. Hass. 1977. Sociological carrying capacity and the last settler syndrome. Pacific Sociological Review 20(4):568-581.

Randal, J. 1977. The Windshield Experience: Visitor density, perceived crowding, and satisfaction in a drive through Dunes Park. 18 p. Paper presented at the annual meetings of the Rural Sociological Society.

Shelby, B., and J. M. Nielson. 1975. Use levels and user satisfaction in the Grand Canyon. 36 p. Human Ecology Research Service Incorporated, Boulder, Colorado.

Vaske, J. J., M. P. Donnelly, and T. A. Heberlein. 1980. Perceptions of crowding and resource quality by early and more recent visitors. Leisure Sciences 3(4):367-381.

U.S. Government Printing Office: 1981 766 875/188 Region No. 6