



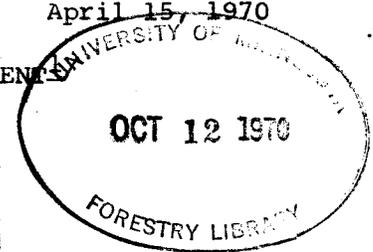
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THE TWIN CITIES CAMPER AND THE STATE PARK ENVIRONMENT

T. L. Brown and L. C. Merriam, Jr.^{2/}



Introduction

It is of primary importance to successful state park planning and management to understand the various interactions between the state park visitor and the park environment. How naturalistically oriented is the state park visitor? To what degree is a state park used for naturalistic purposes, and to what degree is it used primarily for other purposes? To what degree do answers to these questions vary among Minnesota state parks? A study of Twin Citians who camp in three Minnesota state parks, conducted in 1968 by the authors, provides insight into these questions.

Previous Research and Study Objectives

Previous research by West (3) at St. Croix State Park, Minnesota, indicates that an important value of state park camping is that of family social interaction. West found that the family bond was strengthened primarily by mutual family social interaction, rather than by interaction with the natural environment.

Wright (4) was a pioneer in the development of a scale for measuring the naturalistic orientation of the wilderness visitor. A slight modification of a number of his scale items was sufficient to apply the naturalistic orientation scale to state and local park visitors. One portion of the present study deals with the description of Twin Citians who camp in the three parks studied, and the values gained from the state park camping experience. It then compares these users with picnickers at two Minneapolis-St. Paul municipal parks as to user characteristics and the park experience. This was the subject of a previous research note (2).

The second portion of the study measures the naturalistic orientation of visitors to the three state parks, and compares this with the orientation of picnickers in two

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^{2/} Research Assistant and Professor, respectively, School of Forestry, University of Minnesota.

Twin Cities municipal parks. It then examines characteristics which distinguish the park visitor of high naturalistic orientation from the park visitor of low naturalistic orientation. The study also examines activities in which campers participate during the park visit. From these data, a number of implications can be made concerning the importance of the park environment to the state park camper.

Study in Brief

The study areas included Scenic, St. Croix, and Whitewater State Parks, Minnehaha Park in Minneapolis, and Phalen Park in St. Paul. The state parks are located in different geographical regions of the state, and each differs widely from the other two regarding topography, forests, geology, water resources, and therefore, overall natural environment.

Interviewing for the study was performed during the period of June 14 through August 31, 1968. Based on a random sampling design, 306 state park interviews were obtained, 100 each at Scenic and Whitewater Parks, and 106 at St. Croix Park. A total of 143 city park interviews were obtained, 100 at Minnehaha and 43 at Phalen.

The naturalistic orientation scale is a typical Likert scale. It consists of 20 items which measure two dimensions: (1) how one defines a natural area, and (2) the degree to which one values natural areas. Each scale item is a statement concerning a natural area (i.e., "water skiing is a good activity to do on a lake in a natural area"). The interviewee is asked to indicate one of five possible responses to each item: strongly agree, agree, undecided, disagree, or strongly disagree. For each item, the most naturalistic response (either strongly agree or strongly disagree) is given a value of five points, while the least naturalistic response is given a score of one point. Thus, the possible scoring range for the entire scale is 20 to 100.

Wright made both reliability and validity checks on the original scale, and a panel of judges at the University of Minnesota tested the revisions for face validity. Internal consistency tests were also run on the scale, using the Flanagan technique. The Kruskal-Wallis one-way analysis-of-variance-by-ranks test was used to indicate whether differences in park sample scores were significant.

Campers at each state park were asked to indicate what recreational games and equipment they planned to use while camping at the state park. Information gained from the naturalistic orientation scale score and the number of recreational games used while camping, combined with the main reason for camping provide insights into the camper's perception of the park environment.

Results

Results of the naturalistic orientation scale scores show that the Scenic Park camper from the Twin Cities is significantly more naturalistically oriented than Twin Cities campers at the other parks studied. There were no significant differences in naturalistic orientation of St. Croix and Whitewater campers. State park campers had a higher naturalistic orientation than picnickers at Minnehaha and Phalen Parks. The median scores for each park sample are Scenic, 80; St. Croix, 78; Whitewater, 77; Minnehaha, 75; and Phalen, 74. A score of 80 might be interpreted as medium naturalistic orientation; 70, mild naturalistic orientation; 60, neutral; 50, mild unnaturalistic orientation; and 90, high naturalistic orientation. The range of individual scores was from 54 to 96 in city parks and from 59 to 97 in state parks studied.

Table 1. Analysis of variance and treatment and block means of soil compaction by mechanical thinning

Depth (In.)	Treatment		Block		Treatment ^{1/}							Block ^{2/}			
	d.F	F	d.F	F	A	B	C	D	E	F	G	1	2	3	4

Full Tree System

0 - 2	6	3.37*	7	1.67	1.24	1.43	1.36	1.41	1.51	1.40	1.29	1.41	1.26	1.44	1.31
2 - 4	6	6.52**	7	0.57	1.41	1.58	1.51	1.55	1.53	1.61	1.41	1.53	1.48	1.54	1.50
4 - 6	6	7.87**	7	1.82	1.40	1.61	1.57	1.60	1.58	1.58	1.49	1.56	1.53	1.59	1.51
Mean					1.35	1.54	1.48	1.52	1.54	1.52	1.40	1.50	1.42	1.52	1.44

Tree Length System

0 - 2	6	1.17	7	0.04	1.32	1.41	1.40	1.28	1.29	1.31	1.31	1.36	1.31	1.35	1.30
2 - 4	6	7.62**	7	0.80	1.48	1.59	1.61	1.50	1.54	1.59	1.47	1.53	1.53	1.55	1.56
4 - 6	6	2.75*	7	0.01	1.53	1.63	1.66	1.57	1.53	1.58	1.46	1.57	1.53	1.57	1.58
Mean					1.44	1.54	1.55	1.45	1.45	1.49	1.41	1.49	1.46	1.49	1.48

* Significant at 5% level
 ** Significant at 1% level
 1/ Mean of eight samples
 2/ Mean of fourteen samples

No significant differences were detected between blocks (Table 1). These data indicate that the frequency of travel is not a significant factor on this type of soil and mechanical thinning operations. However, a heavier soil type such as a silt loam or clay may respond differently.

Multiple range tests were conducted to determine significant differences between individual treatment means (Table 2). In the full tree system at the 2-4 and 4-6 inch depths all treatments were significantly different from the control areas. Treatments F, D, B, and E were significantly different from control point A at the 0-2 inch depths while only point E was significantly different from both control areas.



Figure 3. Tree length system after thinning operation was completed.



Figure 4. Full tree system after thinning operation was completed.

Table 2. Multiple range tests of soil compaction by mechanical thinning^{1/}

Full Tree System			Tree Length System		
Sample Depth (In.)			Sample Depth (In.)		
0 - 2	2 - 4	4 - 6	0 - 2	2 - 4	4 - 6
A	A	A	D	G	G
G	G	G	E	A	A
C	C	C	G	D	E
F	E	E	F	E	D
D	D	F	A	B	F
B	B	D	C	F	B
E	F	B	B	C	C

^{1/} Treatments connected by the same line are not significantly different at the 0.05 level.

Multiple range tests for the tree length system does not exhibit the definite pattern which existed with full tree system. Treatments B, F, and C were different from the control at the 2-4 inch depth. However, only treatments B and C showed significance at the 4-6 inch depth. These data indicate that in this system soil compaction occurred only in areas directly under the tracks of the mechanized equipment. The tree length logs appear to have no influence on soil compaction in this system; whereas, significant differences were detected in zones where the full trees were skidded in the full tree system.

The magnitude of increased bulk density was 5 and 11 percent for the tree length and full tree system, respectively. The long term effects of these increases in bulk density by full tree and tree length logging systems are unknown at this time. The effects of soil freezing during the winter, particularly preceded by a wet fall, may rehabilitate these areas. Other effects such as regrowth of vegetation and precipitation are also unknown. Future studies will be needed to evaluate these unknowns.

CONCLUSIONS

Mechanized thinning of a 90 to 100-year old red pine stand by 16-foot strips on a sandy soil was shown to increase the bulk densities of these soils. The full tree system showed a two-fold increase in bulk density over the tree length system, and it occurred over a larger area. Long term compaction effects of these systems are unknown at this time.