

WATERCRAFT USER CHARACTERISTICS, MANAGEMENT PREFERENCES, AND USER ENCOUNTERS ON THE UPPER DELAWARE SCENIC AND RECREATIONAL RIVER: 1979 - 1996

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Abstract: Recreational boaters on the National Park Service managed Upper Delaware Scenic and Recreational River were surveyed about their characteristics, management preferences, and user encounters. Field interviews were conducted from Memorial Day weekend through Labor Day weekend during the summer of 1996. A total of 650 boaters were contacted at public and commercial access sites and asked to participate in a brief interview and a follow-up mail survey. During the interview process, 602 boaters gave their addresses and agreed to participate in the mail survey. Of the 585 surveys deliverable, 326 were returned for a 56% response rate. Comparisons were made with a similar boater study conducted on the Upper Delaware Scenic and Recreational River in 1979.

Introduction

In 1978, Congress designated 73.4 miles of the Upper Delaware River as part of the National Wild and Scenic River System (NWSRS). The National Park Service (NPS) began management of the river in 1980. The Upper Delaware Scenic and Recreational River (UDSRR) is located south of the Catskills along the New York - Pennsylvania border. The designated portion of the river extends from the confluence of the Upper Delaware's east and west branches in Hancock, New York, and extends downstream to Mill Rift, Pennsylvania. Unlike many of the other rivers in the NWSRS, the UDSRR is located near a major metropolitan area and receives high levels of watercraft use. The river corridor is mostly privately owned and the land is not managed by a federal agency. While the NPS has jurisdiction on the water, the agency only owns and manages 24 acres along the UDSRR.

The NPS reserves the right to monitor an area of interest within the UDSRR watershed. With the cooperation and approval of the NPS, the Upper Delaware Council, the Delaware River Basin Commission, the Citizens Advisory Council, the Commonwealth of Pennsylvania, the State of New York and the affected political subdivisions of these two States, the current river corridor area that the NPS

monitors has been set at 55,574 acres. This allows the NPS certain management rights outside of the river and the 24 acres that it owns. The corridor boundary has been drawn to define an area in which there is a national interest. The intention of this is "to protect water quality, preserve natural features, provide for recreational uses, provide for the continuation of agriculture, conserve river resources, and maintain existing land use patterns." (Conference of Upper Delaware Townships and NPS 1986). The previous rights of land owners within the 52,400 acres of this project boundary are not limited or infringed upon.

Some of the UDSRR's river access sites are owned by the New York State Department of Environmental Conservation (NYSDEC) and held in cooperative management with the NPS. The NPS works in partnership with the NYSDEC at these sites, but is directly responsible for the day to day management of them. The Pennsylvania Fish Commission manages several sites along the river in a cooperative agreement with the NPS. There are many private access sites along both sides of the UDSRR that are owned and managed by commercial outfitters or by other organizations for their customers or members.

The first watercraft user study on the UDSRR was conducted in 1979 (Dawson et al. 1981a and 1981b) as part of the National River Recreation Study (Knopf and Lime 1984). Subsequent research on recreational river use on the UDSRR has been limited (Marion 1989, Pawelko 1996). In 1995, the NPS field staff expressed interest in better understanding and documenting current river user characteristics on the UDSRR. A 1996 study (Bowes 1997) was designed and conducted that was similar in research design and methodology to the 1979 study.

The NPS annual reports (unpublished) for the UDSRR estimated that recreational use of the UDSRR included 496,397 visits in 1996 with 80% due to boaters. Other users included anglers, swimmers, NPS historic site visitors, and other tourists seeking information from NPS offices. Estimated recreational use has risen dramatically (213%) from the 158,375 visitors in 1981 which was the first year of NPS management on the UDSRR.

The goal of this paper is to report on two objectives of the 1996 study: (1) to measure the characteristics, management preferences, and user encounters experienced by watercraft users on the UDSRR in 1996; and (2) to compare the results of the 1979 and 1996 watercraft user studies.

Methodology

The field research for the 1996 study was carried out between June 1 and August 31. A total of 14 weekend days, and 6 weekdays were sampled systematically across the public and commercial access sites. Brief field interviews were conducted to measure descriptive user characteristics such as group composition, watercraft type, origination and destination points on the river, and to ask boaters for their cooperation in a follow-up mail survey. The mail survey was similar to the questionnaire used in 1979. A modified Dillman technique was used (Salant and

Dillman 1994) and up to three mail survey reminders were used to ensure a high response rate. The research and sampling methodologies for the studies in 1979 and 1996 were similar so that direct comparisons could be made between the results. Statistical tests between the two data sets were not conducted because the 1979 data set was not available for analysis.

A total of 650 boaters were contacted in 1996 at public and commercial access sites and asked to participate in a brief interview and a follow-up mail survey. During the interview process, 602 boaters gave their addresses and agreed to participate in the mail survey. Seventeen of the surveys sent out were undeliverable. Of the 585 surveys deliverable, 326 were returned for a 56% response rate in 1996. All 326 surveys from the 1996 study were used in the following analysis and compared to the 230 surveys returned (67% response rate) in the 1979 study (Dawson et al. 1981a and 1981b).

Boater Characteristics

The states of residence reported by boaters has changed noticeably in 17 years (Table 1). Of the three states that can be compared, the only one that has diminished participation is New York with a 11% decrease in the number of boaters that claim it is their state of residence. More boaters are now coming from both New Jersey and Pennsylvania than they did in 1979. Boaters from New Jersey have increased by 10%, and boaters from Pennsylvania have increased by 2%. Only 4% of the boaters were coming from outside of the tri-state area in 1996.

People who reported participating in commercial trips has decreased by 15%, and those who reported being on a private trip using their own equipment rose by 14% (Table 1). More people own their own watercraft and have the interest to plan and manage their own trips. These changing trends are highlighted by the types of watercraft boaters are using today. The percentage of boaters rafting the UDSRR has risen to 47%, while the percentage of boaters using canoes has dropped to 48%. The recreational boating experience is affected by this change in watercraft in such characteristics as length of trip, speed of travel, and group size. These characteristics can also change the need for facilities along the way, location of access sites, and the behavior of boaters.

The percentage of boaters that reported being with family members dropped 30% since 1979 and groups consisting of friends dropped by 4% (Table 1). The one group type that increased is organizations which grew by 11% over the last 17 years. This may be related to the rise in the use of rafts since they can accommodate more boaters in one watercraft and allow members of an organization to spend time together.

The percentage of boaters coming to the UDSRR for day trips versus overnight trips has remained unchanged in the last 17 years (Table 1). The number of boaters who had

floated the Upper Delaware one or more times prior to their interview has grown by 17% since the last study.

Table 1. Boater characteristics compared between the 1979 and 1996 UDSRR studies.

	1979	1996
Residence	Percent	Percent
New York	56	46
New Jersey	27	38
Pennsylvania	10	12
Others	7	4
Trip Type		
Commercial	89	75
Private	11	25
Watercraft Type		
Canoe	90	48
Raft	1	47
Kayak	4	4
Other	5	1
Group Type		
Friends	75	45
Family	47	44
Organization	10	21
Trip Length		
Day Trip	68	65
Overnight Trip	32	35
Previous Experience		
More than one trip on The UDSRR	52	69

Boater Motivations

Seventeen of the 29 motivational statements in the 1996 study had 50% or more of the boaters reporting that they agreed or strongly agreed with the motivational statement (Table 2). The top motivation for boaters visiting the UDSRR remains 'viewing scenery' which increased by 12% since 1979. Five of the other motivational variables also increased in percentage of boaters who agreed or strongly agreed that those were important motivations for their trips to the UDSRR. 'Spending time with friends' has moved from the fourth most highly rated motivation in 1979 to the second in 1996, ahead of 'peace and calm' and 'excitement.' A seventh motivational variable 'to get away from crowds' is considered as staying the same between 1979 and 1996. Ten new variables were used in the 1996 study that could not be compared to the 1979 results; all had a majority of boaters who reported that they agreed or strongly agreed that those were also important motivations for their trip to the UDSRR.

Perceived Recreational User Problems

Nine of the 30 boater related problems in the 1996 study had 50% or more of the boaters reporting that they agreed or strongly agreed with the problem statement (Table 3). All nine variables decreased in the percent of boaters who rated them as a perceived problem. This decrease in the percent of boaters that rate certain variables as problems could be caused by many things such as: less knowledge of the issues, less concern for the issues, or improvements in those areas. One fact that supports the latter possibility is that the number of boaters who previously visited the UDSRR has risen by 17% since the 1979 study (Table 1). In 1979, the situation considered by the highest percent of

boaters to be a problem was 'low water'; however, in 1996 this variable was ranked seventh in order of percent response. The problem of 'too few garbage cans' decreased by 17% since 1979 which suggests that this situation has improved. Both 'litter on the banks' and 'litter in the river' decreased by 14% from 1979 to 1996. It is important to note that six of the problems perceived by

50% or more boaters in 1996 were also considered problems by 50% or more boaters in 1979. Only two of the 1979 problems, 'low water' and 'unskilled boaters,' were no longer seen as problems by the majority of boaters in 1996. Fifty percent of the boaters perceived that insufficient information about the river was a problem in 1979 and 1996.

Table 2. The percentage of boaters who agree or strongly agree with a motive for boating on the UDSRR during the 1979 and 1996 studies.

Boater Motivations*	1979 Percent	1996 Percent
<i>Increased</i>		
View Scenery	84	96
Spend Time with Friends	71	89
Peace And Calm	80	81
Excitement	77	80
To Exercise	63	75
Experience New Things	59	70
<i>Decreased</i>		
Get Away From Crowds	60	59
<i>No Comparison</i>		
Change Of Routine	-	91
Get Away From Life	-	88
Close to Nature	-	88
Run the Rapids	-	86
Release Anxiety	-	80
Rest	-	72
Part of Group	-	67
Spend Time with Family	-	58
Similar People	-	53
Reflect	-	51
Developing Skills	68	-

*Originally measured on a 5-point Likert scale: -2= Strongly Disagree, -1= Disagree, 0= Neutral, 1= Agree, 2= Strongly Agree.

Table 3. The percentage of boaters who report a slight to serious problem while boating on the UDSRR during the 1979 and 1996 studies.

Perceived Boater Problems*	1979 Percent	1996 Percent
<i>Decreased</i>		
Inadequate Toilets at Stops	69	62
Litter On The Banks	74	60
Inadequate Toilets At Access Points	60	57
Litter In The River	70	56
Too Few Garbage Cans	68	51
Inadequate Brochures	51	50
Low Water	76	41
Unskilled People	50	37
<i>Stayed The Same</i>		
Insufficient Information	50	50
<i>No Comparison</i>		
Too Few Drinking Water Sources	60	

*Measured on a 5-point scale: 1= Not a problem, 2= Slight problem, 3= Moderate problem, 4= Serious problem, 5= Very serious problem.

Preferred Management Actions

Eleven of the 20 proposed management action statements in the 1996 study had 50% or more of the boaters reporting that they agreed or strongly agreed with the proposed statement (Table 4). The variables in Table 4 are organized from highest to lowest percent with the rank order of all nine variables from both studies remaining the same over the last 17 years. Four preferred management actions had an increase in reported support while five reported some decrease in support. The largest differences in percentages between the studies were for the decreases in number of boaters supporting: (1) 'post hazard signs' which decreased 15% since 1979, and (2) 'more enforcement patrols' which decreased 13% since 1979 and has become an issue that is not supported by the majority of boaters. Out of all the variables that 50% or more boaters supported in 1979, two no longer have the majority supporting them in 1996. Comparisons could not be made between five of the management variables because they were not included in each study. Two new variables were used in the 1996 study that could not be compared to the 1979 results -- 'improve access sites' and 'new visitor center' -- and both were supported by a majority of boaters. Three of the 1979 study variables were not replicated in 1996.

Table 4. The percentage of boaters who agree or strongly agree with a preferred management action on the UDSRR during the 1979 and 1996 studies.

	1979	1996
Preferred Management Actions	Percent	Percent
<i>Increased</i>		
Carry Out Trash	84	88
Add Hiking Trails	78	79
Designate Campfire Areas	59	66
Improve Loading Areas	48	55
<i>Decreased</i>		
More Mile Markers	73	68
Post Hazard Signs	73	58
Campsites At Access Points	64	54
More River Campsites	54	49
More Enforcement Patrols	55	42
<i>No Comparison</i>		
Improve Access Sites	-	64
New Visitor Center	-	64
Provide More Information	75	-
Provide Firewood	58	-
Prohibit Off-Road Vehicles	54	-

*Originally measured on a 5-point Likert scale:
-2= Strongly Disagree, -1= Disagree, 0= Neutral, 1= Agree, 2= Strongly Agree.

User Encounters

The percentage of boaters who experienced the number of watercraft encounters they expected rose over the last 17 years in both the 'put in' and 'take out' variables (Table 5). Since the number of boaters who had been on the UDSRR previously had increased since 1979 (Table 1), this would seem to imply that boaters today have a more accurate idea

of how many encounters to expect based on previous trips to the UDSRR.

Table 5. Expectations of boaters for the number of other watercraft that would be encountered versus what they actually experienced during their trip on the UDSRR in 1979 and 1996.

	At Put In		At Take Out	
<i>Number Of</i>	1979	1996	1979	1996
Watercraft Expected*	Percent	Percent	Percent	Percent
Fewer or Far Fewer than Expected	19	21	20	20
What Expected	57	65	55	63
More or Far More than Expected	24	14	25	17

*Originally measured on a 5-point scale: -2= Far Fewer, -1= Fewer, 0= What Expected, 1= More, 2= Far more.

Boaters were asked to estimate the number of other watercraft they saw at the put in and take out access points during their trip on the UDSRR in the 1979 and 1996 studies (Table 6). A majority of boaters in both studies reported seeing between 1 to 25 other watercraft at both put in and take out points. While there has been an increase in the percent of boaters seeing 1 to 25 other watercraft in 1996, the percentage of boaters reporting the higher watercraft encounter categories has decreased over the last 17 years. In both studies, only a minority of the respondents reported seeing more than 25 other watercraft at the put in and take out points and this percentage has decreased. It is difficult to determine the exact cause of this decrease in the percent of boaters seeing high numbers of other watercraft at the put in and take out, but it does not necessarily imply overall decreasing use levels on the UDSRR (e.g., users may be better distributed along the river).

Table 6. The number of watercraft encountered by boaters during their trip on the UDSRR in 1979 and 1996.

	At Put In		At Take Out	
<i>Number Of</i>	1979	1996	1979	1996
Watercraft Seen	Percent	Percent	Percent	Percent
0	6	5	5	8
1-25	65	77	60	72
26-50	19	11	22	14
51-75	4	1	5	2
76-100	5	4	5	2
>100	1	2	3	2

Boaters were asked how they felt about the number of other watercraft they encountered at different times during their trip on the UDSRR during the 1979 and 1996 studies (Table 7). This information shows a substantial rise in the percentage of boaters who rated their feelings about watercraft encounters as neutral; these feelings of neutrality increased 19% at the put in, and 18% at the take out. This may indicate a more tolerant attitude or more realistic expectations. Probably the increases in the percent of boaters with previous experience on the UDSRR has created more realistic expectations about the amount of

other watercraft to expect. The percentage of boaters who would like to see more other boaters decreased 11% between 1979 and 1996 for both put in and take out points along the UDSRR. The percentage of boaters who reported seeing too many other watercraft decreased as well for both put in and take out access points on the UDSRR.

Table 7. Feelings of boaters about the number of other watercraft they encountered versus what they would like to experience during their trip on the UDSRR in 1979 and 1996.

<i>Number Of Watercraft Wanted to Experience*</i>	At Put In		At Take Out	
	1979 Percent	1996 Percent	1979 Percent	1996 Percent
Would like to see More or a Few More Watercraft	15	4	13	2
Neutral	62	81	65	83
Saw Too Many or Far Too Many Other Watercraft	23	15	22	15

*Originally measured on a 5-point scale: -2= See More, -1= See Few More, 0= Neutral, 1= Few Too Many, 2= Far Too Many.

Summary and Discussion

Some of the important comparisons between the results of the 1979 and 1996 studies that have management implications are:

- An increased use of rafts (up to 47% in 1996) as the watercraft of choice has management implications due to the larger social group involved in each watercraft, slower travel, less distance traveled, and other factors.
- An increase in the percentage of private trips and organized groups suggests shifts in user types.
- Boater motivations have remained complex and relatively constant for seven motives.
- An increase in the previous boating experience on the UDSRR and in the percent of boaters experiencing the amount of encounters they expected indicates more accurate expectations by boaters.
- The perceived problems of boaters include the need for more boater services and information; these have remained the same in rank order of percentage reporting a problem but decreasing percentage ratings indicate management success, especially in view of the dramatic increases in use.
- The preferred management actions include more boater services and signage on the river.

The increase in visits to the UDSRR from 1981 to 1996 and the declining percentage of boaters who perceive problems suggests that management on the river has been successful. The cooperative management between the NPS, the Upper Delaware Council, the Delaware River Basin Commission, the Citizens Advisory Council, the Commonwealth of Pennsylvania, the State of New York, and the counties and townships within the UDSRR corridor makes management complex but boaters were more satisfied

(i.e., reported fewer percentage of problems than in 1979) in 1996. However, continued effort to further mitigate problems and provide better boater services and information are necessary. Future research on UDSRR boaters should be conducted every two to five years rather than the 17 years since the last study as more short term trends and fluctuations can be monitored and guide the management process.

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