ASSESSING RIVER RECREATION USE AND PERCEPTIONS OF ENVIRONMENTAL QUALITY TRENDS ON MICHIGAN'S UPPER MANISTEE RIVER

Charles Nelson, Ph.D.
Associate Professor, Department of Park, Recreation, and Tourism Resources, 131 Natural Resources Bldg. Michigan State University, East Lansing, Michigan 48824-1222

Brian Valentine
Masters Student, Department of Park, Recreation, and Tourism Resources, 131 Natural Resources Bldg. Michigan State University, East Lansing, Michigan 48824-1222

Abstract: Through vehicle counts and windshield surveys at 43 public access points and a mail questionnaire to shoreline property owners, Michigan State University researchers estimated the recreation effort on a 55-mile stretch of Michigan's upper Manistee River from April 28 - September 3, 2001. In addition, public access point user satisfaction, perceived trends in the river environment, local spending by visitors originating outside the 3 counties adjacent to the river and the condition of public access points were assessed. Public access point visitors and property owners and their guests logged more than 1.2 million user hours. Key activities were non-motorized watercraft use (e.g., canoeing, kayaking and tubing), fishing, and nature observation. Eighty-eight percent of public access point visitors were satisfied with their experience, 5% were neutral and 6% were dissatisfied. Satisfaction was primarily attributed to the rustic nature of the river, fishing and access site maintenance. Despite high levels of use on the river, public access point users were most likely to perceive that the overall environmental quality of the river had remained the same or improved over the years they had visited the river. The river's many visitors were a boon to the local economy, spending nearly 3.5 million dollars in local businesses. Finally, by on-site inspection after the spring - summer study period, researchers judged that most public access points were safe, well maintained, and had minimal negative environmental impact from erosion.

Introduction

Understanding the type and intensity of recreation on landscapes and facilities is a benefit to natural resource managers. Access to baseline recreation data and follow-up monitoring helps managers identify changes in use patterns and determine recreation's effect on environmental quality and social harmony.

A consortium known as the Manistee River Access Committee (MRAC) contracted with Michigan State University to better understand recreational use and access site use and maintenance on a 55-mile stretch of Michigan's upper Manistee River. The specific objectives were to: A.) estimate peak season (April 28 - September 3, 2001) river recreational use from selected public and private-business-owned river access sites and private shoreline property, B.) assess recreation experience satisfaction, perception of environmental trends with the river and local spending of visitors originating outside the three counties contiguous to the river C.) identify and make recommendations to remedy management concerns about selected access sites. The MRAC includes representatives from area canoe liveries, fishing guides, private landowner associations, and the Michigan Department of Natural Resources' (MDNR) Forestry, Minerals and Fire Management Division (the study area's lead land manager), Fisheries Bureau, Parks and Recreation Bureau, and Law Enforcement Divison. MDNR provided the bulk of funding necessary to complete this study, with supplementary funds provided by the Michigan Agricultural Experiment Station.

The study area of the Manistee River winds through three counties (Otsego, Crawford and Kalkaska) in Michigan's northern lower peninsula with the upstream limit at Mancelona Road in Otsego County and the downstream limit at state highway M66 in Kalkaska County (Figure 1). The river is one of northern Lower Michigan's most important watercourses because it provides significant habitat for stream trout and forest/wetland associated wildlife and plants, and recreation opportunities for fishing (labeled a blue ribbon trout stream with "flies only" tackle restrictions for a third of the study area), rustic camping, nature study, and non-motorized watercraft recreation, such as canoeing, kayaking, rafting and tubing.

Methods

On-site use survey. Two field researchers counted vehicles at 43 access points (39 public and four private canoe liveries) on selected sample days and times (8AM to 8PM) during April 28 - September 3, 2001 (opening day of trout season through Labor Day). Researchers left a self-administered mail-back postcard survey on each vehicle for the driver to determine the type and duration of activities by those from the vehicle while parked at the site and to identify recreators' social dimension concerns (e.g., experience satisfaction and perceived trend in the river' environmental quality). Private business owners gave researchers permission to sample their customers prior to the start of the study.

A mean estimate of people hours/vehicle was computed from survey data and extrapolated by the car counts across all access sites for all days during the study period. This is a conservative extrapolation approach because it does not account for early morning (prior to 8AM) and nighttime use (after 8PM). Sampled persons were divided into two categories: campers and non-campers because campers reported longer stays and involvement in a wider range of activities than non-campers. A maximum value of 15 hours of use per day per individual in the vehicle was allowed, which is roughly equivalent to the average amount of daylight during the study period. This methodology is similar to that used on another Michigan river, the Pere Marquette (Johnson and Nelson 1999).

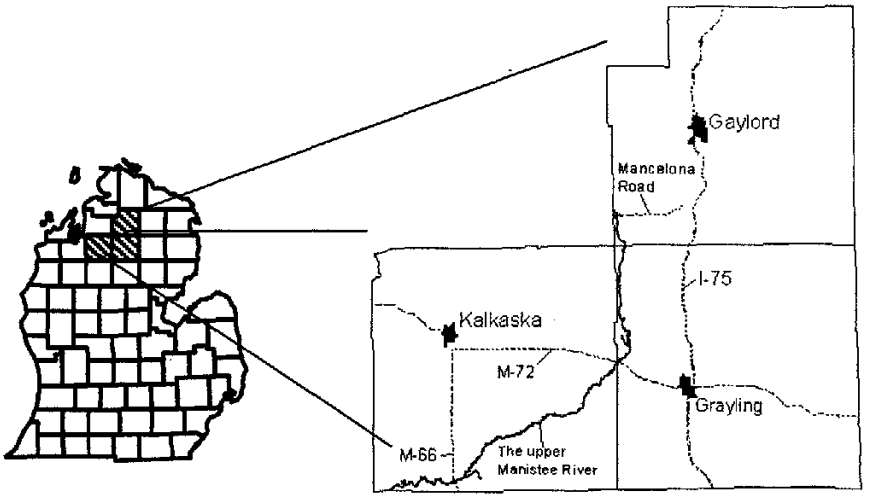

Figure 1. Michigan counties surrounding the upper Manistee River

Private shoreline use. Researchers estimated the recreational use generated from private shorelines using a self-administered, mail-back survey sent to the 627 distinct property owners (individuals, groups, and corporations) identified from the assessment records of Crawford, Kalkaska, and Otsego counties. Owners reported their recreational activities and the amount recreational use from their property by themselves and their guests during the study period. This methodology is also similar to that used on the Pere Marquette River (Nelson and Johnson 1998).

Access site analysis. Researchers visited each study access site in the fall of 2001 (October and November), so the full effect of a season of recreational use could be clearly discerned. From these visits and a photographic record, each site was evaluated vis-à-vis its public use opportunity, environmental concerns, public safety concerns, visible conflict with adjacent property owners, and state of maintenance.

Results

Response rate. Field researchers left windshield surveys on 4,867 vehicles of the 5,272 vehicles counted. Of the counted vehicles, 405 were departing vehicles or campers surveyed the previous day that declined to complete another survey. Of the surveys distributed, 1,080 (22%) were completed and returned. After two mailing attempts, 16 of the 627 shoreline owners had invalid addresses according the US Postal Service. Of the remaining 611 owners, 396 (65%) completed and returned the survey.

Recreation hours. Field researchers counted 5,272 vehicles parked at the 43 access points, which extrapolates to 39,447 vehicles for all access sites over the study period. Of this estimate, 60% of the use occurred on Saturday and Sunday and 40% during the week. Access site visitors engaged in more than a million hours (1,027,957) of daylight recreation, over half of which was generated from the study area's five campgrounds (four state forest campgrounds and one commercial campground).

Of shoreline ownerships, 24% were principal homes, 56% were second homes, 9% were vacant land with temporary housing such as a trailer and 11% were vacant land with no housing. The mean shoreline ownership generated 325 hours of river recreational use during the study period. This amounts to 203,725 hours from the shoreline ownerships. The estimate is conservative because it does not count time spent observing the river from indoors or upland activities on the owner's property where the river plays a role but is not physically entered (e.g., a picnic or sitting on the porch in the evening). Each ownership provided access to an average of 16.3 people, for a total of 10,220 distinct people accessing the river from non-commercial private ownerships.

Overall, researchers estimate 1,231,682 hours of daylight recreation occurred during the study period. Of this, public access points (including commercial canoe liveries) facilitated 83% of those hours, while private, non-commercial shoreline ownerships facilitated the remaining 17%.

Recreation activities. Non-motorized watercraft use (e.g., canoeing, kayaking, tubing, fishing boat), fishing, and nature observation were the three most common activities among campers and day visitors on the day they were sampled and shoreline owners over the study period (Table 1). Camping was the most common main activity for campers, which often included a bundle of experiences such as outdoor cooking, fishing, swimming, etc. For day visitors, fishing was the most frequent main activity, with watercraft use a near second. For shoreline owners, nature observation was a most important activity for one in five, while fishing was most commonly mentioned as most important.

Table 1. Participation and classification of selected activities as most important for Manistee River recreationists in 2001.

Activity	Campers Participated	Campers Most imp.	Day-users Participated	Day-users Most imp.	Shoreline owners Participated	Shoreline owners Most imp.
Non-motorized watercraft use	72%	31%	61%	43%	82%	27%
Fishing	52	28	56	50	76	40
Nature observation	65	<1	36	<1	77	20
Camping	100	36	0	0	17	3
All others	NA	4	NA	6	NA	10
Total	NA	100	NA	100	NA	100

Social dimensions. An overwhelming percentage (89%) of access site users were satisfied with their experience. The scenic and rustic nature of their experience, easy river access, good access point and campground maintenance, quality fishing regulations (e.g., "flies only" rule), and fish habitat improvements were commonly cited as factors contributing to a satisfactory experience. Poor fishing, poorly maintained toilets and dumpsters, and too much noise, crowding, littler, and development (i.e., homes) adjacent to the river were typically cited as factors contributing to neutral (5%) or unsatisfactory experiences (6%) of respondents.

When asked if they detected a change in the overall quality of the river environment during the year(s) they had used the river, from their first visit until the one on which they were sampled, 52% of campers and 40% of day visitors detected no change. Of those detecting a change, the majority of both groups were likely to detect a positive change. In 1989, an influential group of upper Manistee River shoreline property owners known as the Upper Manistee River Association (UMRA) in cooperation with the MDNR began significant river restoration efforts to reduce erosion. This was done by stabilizing the river's shoreline with vegetation and rock riprap, to redesigning foot and watercraft access to make them more environmentally benign, improving fish habitat by providing woody cover and reducing sand bed load and encouraging the MDNR to provide vehicle parking at public access points 100 or more feet from the river. Those efforts help contextualize the perceptions of respondents who did detect a change in the overall river environment (Table 2).

Campers and day visitors who had used the river prior to 1989 were most likely to note a change. This is logical since considerable visible effort was placed on improving the quality of the river environment after 1989, especially in and near the four designated state forest campgrounds. However, regardless of when users first visited the river or what group they belonged to (campers or non-campers), if a respondent noticed a change, it was more likely that change was positive than negative. UMRA's work becomes more relevant when four of the common reasons given for a perceived environmental quality improvement are noted: erosion control, improved access, better fishing success, and fish habitat improvements.

Table 2. Public access point user assessment of overall environmental quality change in the upper Manistee River since their initial visit.

User segment	Saw a change	Positive change	Negative change
Campers, unsegmented	47.7%	64.7%	34.7%
Campers, 1st visit prior to 1989	64.0	61.5	38.5
Campers, 1st visit 1989 or after	32.9	70.4	29.6
Non-campers unsegmented	59.8	59.8	40.2
Non-campers, 1st visit prior to 1989	73.5	59.1	40.9
Non-campers, 1st visit 1989 or after	39.4	61.5	38.5

Local spending. The river attracts a large percentage of access point visitors from outside the three counties encompassing the study area (93.3% of campers and 85.9% of non-campers were non-local). These visitors contributed an estimated $3,492,720 to the local economy during the study period. Of those visitors, 91% of campers and 80% of day visitors reported they spent something in the local area (within 20 miles of where they were surveyed) during the 24 hours of their experience prior to being surveyed. On average, campers per vehicle spent $102.99 in the 24 hours prior to sampling in the local area and day visitors per vehicle spent $94.20. Groceries were the most common item purchased by both groups, followed by lodging (e.g., camping fees for campers), vehicle related expenses (e.g., gasoline), and meals and drinks from restaurants and bars. The rental of watercraft and guide services is especially important to the local economy and 34% of campers and 23% of day visitors spent something in this sector.

Access point assessment. Overall, the primary author judged the access points to provide reasonable environmental protections and safe, appropriate public

access. Key environmental and access considerations included keeping parked vehicles more than 100 feet from the river and providing canoe slides, well maintained wooden stairs, and functional but not obtrusive erosion control and nearby fish habitat structures.

Certain access points needed significant improvement. One point near the southern end of the study area was judged unsafe because vehicles trailering boats must back across a paved county road with a 55 mile per hour speed limit on a curve with limited sight lines. This site is especially popular with fishing guides who had long drift boats requiring substantial trailers and with canoe liveries for group canoe pickup. It also has minimal parking and the parking lot was too close to the river. Closure of the existing access site and construction of a new site to meet identified needs at a nearby location with adequate launching and parking off the main county road is recommended. A small number of access sites, one of which is a campground, have roads paralleling the river, often within 20 feet of it. This situation is an environmental and safety hazard. These roads should be closed and erosion control measures around them redoubled. A third concern was a group of access sites far upstream designed to provide walk-in fishing opportunities. These sites had no name or directional signage on the main road, substandard access roads, poorly signed parking areas and rusty guardrails to channel vehicles and visitors. This lack of professionalism is inconsistent with the MDNR's management philosophy and with the provision of a high quality stream environment. Improved signs of plastic or metal should replace the existing tattered paper ones, guard rails should be painted and gradually replaced with natural vegetation, and access to these sites should be well maintained and clearly marked on the main road.

Of three additional concerns, one was the only state forest horse trail campground (Goose Creek Trail Camp) near the river. This presents some unique challenges. During heavy use, more than 60 horses are tethered within 150 feet of the river. The designated horse trail crosses the river, with horses riding through the river. In addition, non-horse related campers, to avoid mingling with equestrian campers have begun to camp directly on the riverbank, including parking their cars within 10 feet of the river. It is recommended that all camping and roads be more than 100 feet from the river and that an alternative, non-water crossing for horses be developed. At the closed Smithville State Forest Campground (at the downstream, southern end of the study area) illegal ORV use (not on a designated ORV trail or route) is visible, causing erosion on slopes near the river. ORV laws need to be clearly enforced, the slopes stabilized and the vegetation restored. Finally, the King Road pull-offs (in the middle of the study area), where significant efforts have been made to minimize erosion, still have a challenge with parking generally within 10 feet of the river. A larger, underlying problem is that King Road is a major sandy county road that parallels the river for more than a mile, often at a distance of less than 20 feet. This will cause continued erosion that is difficult to remedy. A shift of that road back away from the river would be an environmentally sound, though initially expensive decision.

Discussion

The upper Manistee River is a busy recreational river with over 1.2 million hours of daylight use from the traditional opening of stream trout season through Labor Day in 2001. Visitors to the 43 public and private-business-owned access points accounted for 83% of that use, with almost forty thousand vehicle days. Those visitors generated almost $3.5 million for Crawford, Kalkaska and Otsego county businesses, with a small portion of the lodging spent for state forest campground camping permits. Restaurants, grocery stores, convenience stores, guides, canoe liveries, gasoline stations, motels, and sporting goods retailers all benefited from this spending.

Visitors were generally highly satisfied with their upper Manistee River experience. Positives included good fishing, approval of resource protection and habitat restoration and enhancement efforts, well-maintained campgrounds and minimal litter. For the small percentage that was neutral or negative about their experience, overcrowding, noisy people, poor fishing and maintenance and litter concerns were the major barriers to satisfaction.

Recreational use of the river by public access site visitors is primarily focused on angling and watercraft use. For shoreline owners, angling, watercraft use and nature observation are most important. The challenge of melding these uses and populations together while maintaining environmental and experiential quality is daunting. However, visitors have noted environmental change, and most of that positive during their experience with the river environment. The steps that have been taken to reduce the negative environmental impact of public access points, to restore and enhance the environment for stream trout and associated aquatic life and restrictive limits on fish harvest and gear have been well received. A second study of the perceptions of environmental change by shoreline owners is currently in progress and results should shed light on their preferences regarding future corridor management actions.

Of the visitor user hours, half are generated from the four state forest campgrounds and the one commercial campground. This level of use suggests that additional steps may be necessary to further harden these heavily used sites and protect the quality of the environment at these locations and downstream. Of these campground sites, the horse campground appears to have the most significant potential and current erosion and nutrient pollution problems, as well as inappropriately providing vehicle parking within 10 feet of the water which increases the likelihood of gasoline and oil entering the river. On all public campsites, vehicle parking should be 100 or more feet from the water and unnecessary roads closer than that to the river should be eliminated. Day use parking should be clearly designated to reduce conflicts with campers and to set a reasonable physical capacity for use. This may

require the cooperation of counties who manage nearby roads to limit streamside parking.

At the non-campground access points, use varies considerably. The canoe liveries and a few other sites generate most of the use, while many other sites only account for a small fraction. It is important to note that only the canoe liveries, the state forest campgrounds, the Smithville commercial campground and the Park and Recreation Bureau administered sites downstream are well marked and obviously access points to the river. Most other sites have little or no marking/signage, along with little visible parking or public use facilities such as bathrooms and visible canoe access. This model may be appropriate to keep these sites lightly used, but it may also be funneling more use to the few clearly designated sites, especially the public campgrounds.

Unlike the state forest campgrounds, the commercial campground, and the canoe liveries, safety is a major concern at some non-campground access points. Main road related access points (e.g., roadside pull-offs and adjacent to bridges) are a concern because fast vehicle traffic (55mph) and steeper slopes (at bridges which are likely to be in steep valleys) increase speeds and limit visibility. The use of such sites should be minimized and off-road sites developed. Again, the cooperation of counties in limiting parking, reducing speeds and enforcing laws is critical.

The upper Manistee River is a major environmental and recreational asset of northern Lower Michigan. Appropriate access, management of recreationists and their activities and safeguarding of the environment will be critical to maintain this status. This report provides guidance to meet this challenge and a methodology to assess progress. Similar research procedures should be replicated at regular intervals, such as every five years to provide longitudinal data to accurately assess trends and better predict and be proactive about future needs and concerns. This social monitoring needs to be coupled with physical and biological monitoring of key indicators of environmental quality and health such as water quality, fish populations, erosion, etc.

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