

Recreational Visitation Patterns on Lake Impoundments in East-Central Mississippi

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Abstract: The southeastern United States is uniquely positioned to offer its residents and visitors a variety of recreational opportunities year-round. A favorable climate and an abundance of natural and impoundment water acreage provides long seasons for the region's anglers, boaters, campers, and other recreationists. Natural amenities such as water bodies and warm climates have been shown to stimulate economic growth in rural locations and provide substantial quality of life improvements to residents. While economic injections provided by surface water impoundments have been frequently studied, relatively little research has been conducted assessing how visitation patterns to such facilities vary by season. In this paper, we discussed the result of two on-site surveys carried out at lakes in east-central Mississippi. One survey was conducted at the peak of the season and one during the fall. Differences were analyzed along four dimensions: length of stay, party size, travel times, and local visitor expenditures. Our findings indicated that significant seasonal variation exists for most visitor types across these dimensions. Since total new visitor spending in the local economy varies by length of stay, party size, and travel time, these results have important implications for the potential economic stimulus of water-based recreational facilities in the South.

Keywords: Recreation spending, lakes, visitor survey, visitation patterns, water-based activities

Introduction

The southeastern United States is uniquely positioned to offer its residents and visitors access to a variety of recreational opportunities on a year-round basis. A favorable climate and an abundance of natural and impoundment water acreage provide long seasons for the region's anglers, boaters, campers, picnickers, and other recreationists (USDI and USDC 2002). Amenities such as water bodies and mild climates have been shown to stimulate economic growth in rural locations (Deller et al. 2001), which can increase real estate values, enhance the tax base, and provide substantial quality of life improvements to residents. Recently, several local governments in the State have entertained the possibility of creating surface water impoundments as a source of economic development. These projects are envisioned to serve as engines to stimulate rural development and enhance the quality of life for the State's citizens.

Economic injections provided by surface water impoundments have been frequently studied in Mississippi (Grado et al. 2002, Grado et al. 2004, Rezek, et al. 2006a, Rezek, et al. 2006b); however, relatively little research has been conducted on visitors to these sites. Past studies had

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to rely, for the most part, on secondary data sources to determine visitor characteristics and develop visitor expenditure profiles (Grado et al. 2002). This study acquired data from existing lakes in Mississippi, similar to those currently in the early stages of development. While survey dates of this study were limited by funding and time constraints, an effort was made to acquire as much data as possible during peak and off-peak recreational seasons. Key among the focal points of this study was to assess how visitation patterns at such facilities vary by season to better gauge their local impacts. Differences in visitation patterns by visitor type and by season were analyzed across four dimensions: party size, length of stay, distance traveled, and local expenditures for specific recreational activities. The study objective was to acquire a realistic database of visitor spending profiles relative to Mississippi and its recreational water resources. The intent is to use this data to more clearly determine the financial feasibility of new lake impoundments as a source of rural development in Mississippi.

Study Area and Survey Implementation

During 2006, we surveyed recreationists at two U.S. Army Corps of Engineer lakes in the Mobile District. These lake sites were Okatibbee Lake, a 3,800 acre lake near Collinsville, Mississippi, and Columbus Lake, a 8,900 acre lake on the Tennessee-Tombigbee Waterway in Columbus Mississippi. The face-to-face surveys were conducted by Mississippi State University students enrolled in College of Business and Industry's Master of Business Administration (MBA) program as part of their capstone Strategic Business Consulting course. Summer surveys were conducted from July 1st through July 7th and fall surveys were conducted from September 16th through September 24th.

Columbus Lake and Okatibbee Lake were selected for several reasons. First, they offer a full range of recreational opportunities including: fishing, boating, waterskiing, picnicking, hunting, sightseeing, and camping. The impoundments also have substantial recreational infrastructure including: boat ramps, a marina, public docks, rustic and developed campgrounds, trails, parks, picnic areas, swimming beaches, and other land-based facilities. Furthermore, these sites were within close proximity to both Mississippi State University and new impoundments under consideration in several central Mississippi counties. Travel times for the interviewers were relatively short, increasing the time the MBA students could conduct surveys at the sites.

On-site Survey Instrument

An on-site survey instrument was used to eliminate mailing costs, enable interviewers to clearly explain the data being requested, and maximize response rates. We included questions eliciting the location of the recreationists' residence, their trip duration, the number in their party, their primary recreational activity at the lake, and the number of days they would recreate at the lake site during 2006. Respondents were also asked open ended questions about what other activities they would like to see introduced at the lake, and how they found out about the site.

The focus of the survey however was recreation-related expenditure patterns. We asked each individual to provide their short-term on-site and trip-related expenditures, and their long-term equipment expenditures. For on-site and trip-related expenses, we asked recreationists to provide their current 24-hour trip expenditures rather than total trip expenditures. This strategy

attempted to minimize recall errors for recreationist expenses. In instances where recreationists were making a day trip, we asked them to estimate additional trip expenses for the balance of the day. Long-term expenditures were limited to equipment brought to the site and purchased within the year. In-state expenses were cataloged by amount and location, preferably by county. For out-of-state expenses, only the state location of the purchase was documented.

Results

In this study, we focused on differences in visitation and spending patterns by visitor type and season. Specifically we analyzed the party size, length of stay, distance traveled, local expenditures, and off-site expenditures of recreationists participating in the surveys. The results are organized in Tables 1-7. Table 1 details the mean, median and standard deviation of party size at the two lakes surveyed. The first panel shows that the mean and median party size for all recreationists in the summer sample was approximately four persons per party. However, in the fall sample groups were smaller, averaging 2.73 per party with a median of only two persons per group. This implied that recreation at the facilities was based more on family activities in the summer and more on individual type activities in the fall. These results were consistent across the three visitor types; however, they were only statistically significant (at the 1% level) for anglers and all recreationists generally. The average fishing party in the fall was about 2/3 the size experienced at the peak of the summer season. Boating and water sports parties were about 1/4 smaller in the fall than in the peak season. Point estimates for average party size were only slightly smaller in the fall for the ‘other’ category, which included picnickers, swimmers, sightseers, and campers.

Table 1. Median and Mean Party Size by Visitor Type and Season
Derived from On-site Surveys at Okatibbee Lake and Columbus
Lake in Mississippi during 2006.

Seasons (n)	All Recreationists (# in Party)		
<u>Season</u>	<u>Median</u>	<u>Mean</u>	<u>St Dev</u>
Summer (174)	4.00	4.06	3.08
Fall (141)	2.00	2.73	2.26
Anglers			
<u>Season</u>	<u>Median</u>	<u>Mean</u>	<u>St Dev</u>
Summer (43)	3.00	3.72	2.40
Fall (37)	2.00	2.22	1.29
Boaters/Water-skiers			
<u>Season</u>	<u>Median</u>	<u>Mean</u>	<u>St Dev</u>
Summer (64)	4.00	5.09	4.10
Fall (7)	3.00	3.57	2.57
Picnickers, Swimmers, Sightseers			
<u>Season</u>	<u>Median</u>	<u>Mean</u>	<u>St Dev</u>
Summer (67)	3.00	3.30	1.85
Fall (96)	2.00	2.87	2.49

A few differences in length of stay were also evident across seasons as detailed in Table 2.¹ The median visit was only one day in both periods and the average length of stay was between two and two and a half days. This difference was not statistically significant for all recreationists as a whole. According to the point estimates, the differences in average stay were most pronounced among anglers. For these visitors, the median length of stay drops by 2/3 in the fall and the average visit decreases by nearly a full day. The length of stay for boaters and water-skiers is slightly longer for those participating in the summer, but the length of stay did not differ significantly by season for those recreationists in the ‘other’ category. The main result presented in this table was that anglers and boaters tend to cut their fall visits a bit shorter than their summer visits. This was probably weather related in the case of boaters, but in the case of fishermen it may also be the result of diminishing returns. After a long fishing season, anglers may be less interested in pursuing their pastime than earlier in the season.

Table 2. Median and Mean Length of Stay by Visitor Type and Season Derived from On-site Surveys at Okatibbee Lake and Columbus Lake in Mississippi during 2006.

Seasons			
All Recreationists (Days)			
<u>Season</u>	<u>Median</u>	<u>Mean</u>	<u>St Dev</u>
Summer (170)	1.00	2.08	2.23
Fall (140)	1.00	2.39	2.34
Anglers			
<u>Season</u>	<u>Median</u>	<u>Mean</u>	<u>St Dev</u>
Summer (43)	3.00	3.07	2.55
Fall (37)	1.00	2.19	2.59
Boaters/Water-skiers			
<u>Season</u>	<u>Median</u>	<u>Mean</u>	<u>St Dev</u>
Summer (64)	1.00	1.41	1.50
Fall (6)	1.00	1.00	0.00
Picnickers, Swimmers, Sightseers			
<u>Season</u>	<u>Median</u>	<u>Mean</u>	<u>St Dev</u>
Summer (64)	1.00	2.10	2.39
Fall (96)	1.00	2.56	2.29

Travel times by visitor type and season were reported in Table 3. These data were computed for each visitor using Mapquest.com to calculate the travel time between the respondent’s reported county of residence and lake location. The descriptive statistics listed were only for in-state residents, which could be measured more precisely from the collected data. While not much difference occurred across seasons for recreationists as a whole, anglers and boaters and water skiers tended to travel longer distances in the summer than in the fall. The point estimates for

¹ For comparison purposes we eliminated five observations from the sample which heavily skewed the results. Each of these outliers resided at the lakes for more than a month and as long as six months. Two stayed for one month, two stayed for two months, and one stayed for six months. Four of these long-term visitors were interviewed in the summer, one was interviewed in the fall.

picnickers, swimmers, sightseers, and campers indicated longer travel in the fall. None of these results were conclusive, however, as they were not significant at conventional levels.

Table 3. Median and Mean Travel Times by Visitor Type and Season Derived from On-site Surveys at Okatibbee Lake and Columbus Lake in Mississippi during 2006.

Seasons (n)			
All Recreationists (Minutes)			
<u>Season</u>	<u>Median</u>	<u>Mean</u>	<u>St Dev</u>
Summer (147)	24.00	40.48	38.19
Fall (126)	24.00	41.46	36.83
Anglers			
<u>Season</u>	<u>Median</u>	<u>Mean</u>	<u>St Dev</u>
Summer (34)	35.00	42.56	30.51
Fall (37)	51.00	55.70	43.88
Boaters/Water-skiers			
<u>Season</u>	<u>Median</u>	<u>Mean</u>	<u>St Dev</u>
Summer (52)	24.00	39.10	42.22
Fall (7)	24.00	48.43	34.45
Picnickers, Swimmers, Sightseers			
<u>Season</u>	<u>Median</u>	<u>Mean</u>	<u>St Dev</u>
Summer (61)	35.00	40.51	38.96
Fall (82)	24.00	34.44	31.67

Note: In-state visitors only

Table 4 provided some additional documentation regarding recreational travel patterns across seasons. In the summer, 15.5% of visitors came from other U.S. states. While many originated in neighboring Alabama, some traveled from as far away as New Jersey and Montana. In the fall, only 10.6% of visitors come from out-of-state. The proportion of local visitors also differed seasonally. Forty-eight percent of fall visitors came from the county in which the lake was located, but only 42.5% of summer visitors were local residents. The lower incidence of out-of-state visitors and the higher the incidence of local visitors in the fall have important ramifications for gauging the economic impact of recreational facilities. Debate continues on just how much of local visitor spending should be included in economic impact models but this data suggested a higher percentage of off-season spending is not new money injected into the local economy but rather local money that is not escaping to other recreation sites or anywhere else.

While this was an interesting observation, perhaps the most important results of this research were shown in Table 5. As part of the recreational survey, respondents were asked to estimate the per person on-site and trip-related expenditures they made during their trip. Table 5 reported on the median, mean, and standard deviation for this type of spending. These numbers included such items as access fees, food, drinks, ice, lodging, souvenirs, bait, equipment rents, parking, and other expenses incurred at the site itself. They also included transportation, off-site lodging, off-site food, miscellaneous shopping, but do not include other long-term expenditures such as equipment or registration fees.

Table 5 indicated that overall per visitor expenditure rose in the fall compared to the summer season. However, anglers spent about \$35 locally per visitor day and boaters spend about \$28 per visitor day, regardless of the season. Differences were driven by picnickers, swimmers, sightseers, and other recreationists who spend about \$15 more per visitor day in the fall than in the summer season. It was likely that these results were driven by the type of activity in which the recreationists were engaging. For instance, in the fall, when temperatures were cooler, more visitors were camping and less were swimming. Camping required greater expenditures than swimming but also usually entailed a lengthier stay. Our surveys reinforced the common result that day-users typically spent less than overnighters.

Table 4. Origin of Recreational Visitors by Season Derived from On-site Surveys at Okatibbee and Columbus Lake in Mississippi during 2006.

Seasons	Within County	Other MS Counties	Other U.S. States
	%	%	%
Summer	42.5	41.9	15.5
Fall	48.2	41.1	10.6

Table 5. Median and Mean Local Expenditures by Visitor Type and Season Derived from On-site Surveys at Okatibbee Lake and Columbus Lake in Mississippi during 2006.

Seasons (n)	All Recreationists (\$)		
<u>Season</u>	<u>Median</u>	<u>Mean</u>	<u>St Dev</u>
Summer (174)	19.75	28.22	35.08
Fall (141)	24.00	37.47	38.79
Anglers			
<u>Season</u>	<u>Median</u>	<u>Mean</u>	<u>St Dev</u>
Summer (43)	26.00	35.17	41.80
Fall (37)	25.00	34.51	25.41
Boaters/Water-skiers			
<u>Season</u>	<u>Median</u>	<u>Mean</u>	<u>St Dev</u>
Summer (64)	19.75	27.67	33.34
Fall (7)	24.67	27.55	10.62
Picnickers, Swimmers, Sightseers			
<u>Season</u>	<u>Median</u>	<u>Mean</u>	<u>St Dev</u>
Summer (67)	13.50	24.21	31.71
Fall (96)	22.50	39.30	43.95

Table 6 detailed expenditure patterns by length of stay for both summer and fall visitors. In all cases, the point estimates indicated that per visitor day expenditure was greater in the fall than in the summer. In general, there was a larger gap between expenditures for day-users and expenditures for visitors spending a few days or more at the lake. Day users spent in the neighborhood of \$22 to \$27 on average, while overnighters spent in the range of \$40 to \$54 on

average, depending on length of stay and season. In the summer, those making 2-3 day stays spent about \$49 locally and in the fall they spent about only slightly more (\$54). The numbers fell slightly for visitors making longer stays, down to \$40 and \$52 for summer and fall visitors, respectively. These results suggested that more casual visitors – those staying for the day or those visiting in the summer – spent less than those who were presumably more engaged recreationists – fall visitors and multi-day users.

To approximate the economic injections of a typical party of recreationists we provided estimates of total spending for a family of four on a typical trip to a central Mississippi lake. These estimates were shown by season and length of stay in Table 7. Such visitors averaged

Table 6: Median and Mean Local Expenditures by Length of Stay and Season Derived from On-site Surveys at Okatibbee Lake and Columbus Lake in Mississippi during 2006.

Summer (\$)			
<u>Length of Stay (n)</u>	<u>Median</u>	<u>Mean</u>	<u>St Dev</u>
1 day (123)	14.00	22.39	24.70
2-3 days (15)	28.25	48.84	65.55
4 or more days (36)	29.10	39.56	42.48
Fall (\$)			
<u>Length of Stay (n)</u>	<u>Median</u>	<u>Mean</u>	<u>St Dev</u>
1 day (83)	20.17	26.86	35.39
2-3 days (25)	46.00	54.01	34.85
4 or more days (33)	40.00	51.58	41.87

Table 7: Estimated Total Expenditure for a Family of Four by Length of Stay and Season Derived from On-site Surveys at Okatibbee Lake and Columbus Lake in Mississippi during 2006.

Season	Length of Stay	Expenditure
	Days	\$
Summer	1	89.56
Summer	2	390.72
Summer	3	586.08
Summer	7	1,107.68
Fall	1	107.44
Fall	2	432.08
Fall	3	648.12
Fall	7	1,444.24

about \$90 to \$110 in expenditures for a day trip, \$390 to \$430 for a two-day weekend trip, \$590 to \$540 for a long (three-day) weekend trip and about \$1,100 to \$1,450 for a week’s vacation. We find these estimates to be plausible given the economic conditions in Mississippi and the available recreation budgets of the region’s recreationists.

Conclusions

Surface water impoundments can generate substantial quality-of-life improvements and economic impacts for rural areas. These impacts depend critically on how many recreationists frequent the lake, where they come from, how long they stay, what activities they engage in by season, and most importantly how much they spend. This study reported the results of a local recreational survey conducted at existing U.S. Army Corps of Engineers lakes in Mississippi. Our findings suggested that seasonal fluctuations occurred not only in visitor numbers, but also in length of stay, party size, distance traveled, and local expenditures. This result suggested that researchers interested in determining the economic or fiscal benefits of recreational surface water impoundments should proceed with caution when incorporating data collected in one visitor season to make yearly projections. Finally, this paper generated reasonable estimates of the per visitor economic injection that can be expected from surface water impoundments in central Mississippi

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