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2000 Missouri State Park Visitor Attendance Count

Project Completion Report

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2000 MISSOURI STATE PARK VISITOR ATTENDANCE COUNT

Purpose of Study

Visitation numbers have traditionally been used as a common numerator of overall use at Missouri State Parks and Historic Sites. Although cumulative mass counts have notable shortcomings (i.e. repetitive entrances and exits, inaccurate multipliers, etc.), it is important that acceptable levels of accuracy be obtained. Periodic verification of formulas or multiplication rates should be conducted.

The purpose of this study is to provide spot evaluation and determine current multipliers to enhance accuracy of visitation counts. Based upon 1998 reported visitation, ten parks were identified with which to verify the accuracy of attendance counts: Bennett Spring State Park, Cuivre River State Park, Ha Ha Tonka State Park, Lake of the Ozarks State Park, Montauk State Park, Roaring River State Park, St. Joe State Park, Thousand Hills State Park, Truman State Park, and Watkins Woolen Mill State Park and Historic Site.

Methodology

The methodology used in this research was adapted from methodology modified by Fink. In order to require minimal staff participation in sampling, not all of the methodology recommendations suggested by Fink were implemented during the study. It is recommended, however, that a full methodology be implemented at each state park and historic site in the future if a greater level of accuracy in counting attendance is desired.

Sampling Procedures

Each of the parks was sampled from July through September 2000. With a 95% confidence interval and a plus or minus 5% margin of error, a sample size of 400 observations was required from each park. Table 1 shows the sample sizes collected and the margins of error for each park.

In order to require minimal staff time commitment, daily survey periods were only of one hour in length, with seven survey periods scheduled each month (seven hours/month total) during the three months of the study period. A time slot of two hours was randomly selected and assigned to the first of the randomly selected survey dates for each park. Only one hour during each time slot was surveyed, the second hour provided as an alternate for scheduling difficulties. To provide flexibility to staff in the event of conflicting schedules and adverse weather conditions, alternate survey days were also scheduled.

Data Collection

In general, the surveyor was stationed near the entrance to the park or near the vehicle counter in each park. For parks with two entrances into the park, surveying alternated between entrances. For parks with multiple entrances in the park or public roadways passing through the park, surveying alternated either between the multiple entrances into the park or between the entrances into the various use areas within the park. Data collected included date, day of week, time slot, survey location, vehicle type, number of axles per vehicle, and the number of visitors per vehicle (both adults and children), for vehicles entering each park or use area. Data also distinguished between

Table 1. Number of Observations Collected at Each Park

Park	Month	Frequency	Percentage	Margin of Error
Bennett Spring	July	1,340	37.9%	
	August	1,152	32.6%	
	September	1,041	29.5%	+/- 2%
	Total	3,533	100.0%	
Cuivre River	July	224	32.2%	
	August	271	39.0%	
	September	200	28.8%	+/- 4%
	Total	695	100.0%	
Ha Ha Tonka	July	98	36.3%	
	August	89	33.0%	
	September	83	30.7%	+/- 6%
	Total	270	100.0%	
Lake of the Ozarks	July	264	40.7%	
	August	215	33.2%	
	September	169	26.1%	+/- 4%
	Total	648	100.0%	
Montauk	July	88	37.9%	
	August	97	41.8%	
	September	47	20.3%	+/- 7%
	Total	232	100.0%	
Roaring River	July	243	45.8%	
	August	95	17.9%	
	September	193	36.3%	+/- 4%
	Total	531	100.0%	
St. Joe	July	157	34.0%	
	August	177	38.3%	
	September	128	27.7%	+/- 5%
	Total	462	100.0%	
Thousand Hills	July	270	35.0%	
	August	282	36.6%	
	September	219	28.4%	+/- 4%
	Total	771	100.0%	
Truman	July	196	32.6%	
	August	327	54.3%	
	September*	79	13.1%	+/- 4%
	Total	602	100.0%	
Watkins Woolen Mill	July	158	40.9%	
	August	86	22.3%	
	September	142	36.8%	+/- 5%
	Total	386	100.0%	

* Staffing shortage at Truman State Park prevented completion of sampling in September.

park-related vehicles (park staff, concession vehicles, delivery vehicles, etc.) and visitor vehicles.

Results

Table 2 lists the frequency and percentage of visitor vehicles (VV) by category (car, sport utility vehicle, pickup truck, etc.) for each park. Table 3 shows the frequency and percentage of VV axles and park-related axles (PRV) for each park, as well as the average number of axles and the average number of visitors per VV for each park. Knowing the percentage of PRV axles is helpful in determining an estimate of the frequency of PRV traffic. The number of visitors per vehicle can be used as a multiplier to more precisely estimate visitation.

For a park with a single entrance and a traffic counter crossing both lanes of traffic, the following equation provides an example of how to estimate visitation using the percentage of PRV axles, the average number of axles per VV, and the average number of visitors per VV. The following numbers are hypothetical and meant only to provide a sample equation.

Average # of axles/VV = 2.6

Average # of visitors/VV = 3.0

Percentage of PRV axles = 4.3% (calculated by dividing the # of PRV axles by the sum of PRV and VV axles)

Average # of visitors per VV axle = 1.2 (calculated by dividing the # of visitors per VV by the # of axles per VV)

Traffic counter reading = 1,000

1,000 / 2 = 500 axles (traffic counter crosses both lanes and counts by axles)

500 axles – (500 x 4.3% PRV axles) = 478.5 VV axles

478.5 VV axles x 1.2 visitors per axle = 574.2 visitors

Discussion and Recommendations

As shown, knowing the percentage of PRV axles, the average number of axles per VV, and the average number of visitors per VV can more accurately estimate visitation. Having an accurate record of visitation is necessary for park operational planning and budgeting, as well as for providing a simplified means of description of park service output. For these reasons and because visitation rates can change in response to societal trends (i.e. family size and makeup), fuel prices, vehicle sizes, etc., it is important to periodically evaluate the methods used to determine visitation. The following recommendations are suggested as a guide to evaluating visitor count methods, and are based on the recommendations reported by Fink.

Implementation of a consistent and scientifically validated methodology is critical to the success of accurate visitation data collection and should include the following factors: 1) a counter validation correction factor to adjust for differences between traffic counter tallies and actual numbers observed; 2) a non-count vehicle correction factor to account for any non-visitor vehicles crossing the counter (i.e. PRVs), and any visitor vehicles entering and exiting more than once during a visit; and 3) an axle per vehicle factor to account for vehicles with more than two axles. For sites with more than one entrance or with multiple

Table 2. Frequency and Percentage of Vehicle Category by Park

Park	Car, van		SUV, jeep		Pickup truck		RV*		Motorcycle		Bicycle		Other VV		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Bennett Spring	1,464	43.4%	463	13.7%	1,349	40.0%	47	1.4%	29	0.9%			23	0.7%	3,375	100.0%
Cuivre River	350	56.1%	56	9.0%	194	31.1%	6	1.0%	11	1.8%	5	0.8%	2	0.3%	624	100.0%
Ha Ha Tonka	162	62.3%	37	14.2%	52	20.0%	3	1.2%	6	2.3%					260	100.0%
Lake of the Ozarks	285	47.7%	124	20.7%	179	29.9%	4	0.7%	6	1.0%					598	100.0%
Montauk	70	32.1%	38	17.4%	87	39.9%	4	1.8%	17	7.8%	2	0.9%			218	100.0%
Roaring River	241	48.5%	78	15.7%	167	33.6%	5	1.0%	6	1.2%					497	100.0%
St. Joe	185	47.8%	37	9.6%	160	41.3%			4	1.0%	1	0.3%			387	100.0%
Thousand Hills	451	65.3%	81	11.7%	135	19.5%	4	0.6%	14	2.0%	6	0.9%			691	100.0%
Truman	246	42.6%	48	7.8%	217	37.6%	61	10.6%	7	1.2%	1	0.2%			577	100.0%
Watkins Woolen Mill	208	57.9%	21	5.8%	117	32.6%	3	0.8%	8	2.2%	2	0.6%			359	100.0%

* RV includes only motorized RVs, and not towable RVs (i.e. trailers, campers, fifth-wheels, or truck campers).

Table 3. Comparison of Axles and Visitors Per Vehicle, By Park

Park	Frequency and percent of axles per vehicle						Average # of axles per VV	Average # of visitors per VV
	VV		PRV		Total			
	Freq.	%	Freq.	%	Freq.	%		
Bennett Spring	6,997	95.8%	309	4.2%	7,306	100.0%	2.1	2.3
Cuivre River	1,296	90.1%	142	9.9%	1,438	100.0%	2.1	2.1
Ha Ha Tonka	516	96.3%	20	3.7%	545	100.0%	2.0	2.8
Lake of the Ozarks	1,371	93.3%	98	6.7%	1,469	100.0%	2.3	2.3
Montauk	451	94.2%	28	5.8%	479	100.0%	2.1	2.1
Roaring River	1,024	94.1%	64	5.9%	1,088	100.0%	2.1	2.1
St. Joe	829	84.2%	156	15.8%	985	100.0%	2.1	2.5
Thousand Hills	1,427	89.6%	166	10.4%	1,593	100.0%	2.1	2.1
Truman	1,335	96.3%	51	3.7%	1,386	100.0%	2.3	3.0
Watkins Woolen Mill	744	93.0%	56	7.0%	800	100.0%	2.1	2.3

use areas, an overall correction factor that includes the multipliers for each entrance or use area should also be included in the visitor count methodology, since the number of visitors and axles per VV may differ between entrances and areas. An example of this is Watkins Woolen Mill. Although overall results indicated an average of 2.3 visitors per VV, a comparison of the two entrances to the park showed south entrance visitors with an average of 2.3 visitors per VV but north entrance visitors had an average of 2.6 visitors per VV. The percentage of PRV axles also differed between the two entrances, with PRV axles accounting for 35.7% of all axles counted at the north entrance but accounting for only 3.9% of all axles counted at the south entrance.

And finally, the unique setting of the trout parks requires additional factors to be included in the visitation count methodology. It is recommended that traffic counters be used at the multiple use areas within the three trout parks, in addition to the persons per trout tag (PTT) multiplier currently being used. This will be helpful in determining visitation during days when trout tags are not sold. Because the number of visitors staying overnight in the parks (whether in the campgrounds, motels, or cabins) are known, using the PTT multiplier in combination with these numbers may not be providing the accuracy desired since many of the overnight visitors also purchase trout tags. A possible solution to any over-count would be to collect overnight stay information from visitors as they purchase their trout tag.