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ESTIMATE OF ECONOMIC IMPACTS FOR TOURIST ATTRACTION IMPROVEMENTS FOR BIG RIDGE STATE PARK

Burton C. English, R. Jamey Menard, David W. Hughes and Kimberly L. Jensen
Department of Agricultural and Resource Economics

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EXECUTIVE SUMMARY

Big Ridge State Park (BRSP), located in Union County on Norris Lake in East Tennessee, is one of 56 Tennessee state parks. The park employs 12 individuals full time, and 10 additional individuals are seasonal. Provided here are estimates of the economic contribution of BRSP to the four-county (Anderson, Knox, Grainger and Union Counties) economy in which it resides. These estimates include the current contribution of the park and the park's contribution after improvements to park assets (remodeling cabins, adding bike trails, new restrooms, a water trail with a launch area, and new campsites). An IMPLAN-based input-output model of the four-county economy was used to provide an estimate of the total (direct and with multiplier effects) economic impact of improvements to Big Ridge State Park.

Three types of economic impacts are estimated in this analysis — the current level of impact, the impact of investments in improvements to the park, and the impact of attracting new visitors because of the investments. The current impact consists of BRSP expenditures and those of the current visitors. It is estimated that the current impact level to the four-county region consisting of Anderson, Grainger, Knox and Union Counties is $21.7 million. By a one-time investment of $7.3 million in the park's assets, another $3 million to $5 million economic impact could result each year to the regional economy through the attraction of nonlocal visitors. In addition, the investment of $3.5 million to $6.8 million would provide a one-time economic impact to the region of $6.6 million to $14.0 million, along with 53 to126 jobs, depending on whether the low or high bike trail estimate is used.

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1. INTRODUCTION

Big Ridge State Park (BRSP), located in Union County on Norris Lake in East Tennessee (Figure 1), is one of 56 Tennessee state parks. The park is 3,687 acres in size and currently has 15 miles of hiking trails and 50 campsites to accommodate recreational vehicles, trailers and tent campers. Three backcountry campsites are hike-in only. Group camping to accommodate 120 in 19 screened-in bunkhouses is available. Situated on Norris Lake, the park offers aquatic recreational activities such as swimming, paddling, boating and fishing. The park also has 20 one-bedroom rustic cabins open from April through October, a shelter and an assembly hall (Tennessee State Parks, 2020). Over the past five years, based on traffic counts, an average of 1.2 million individuals have entered the park. Park visitation ranges from 1.0 to 1.7 million a year (Montgomery, 2020). The park employs 12 individuals full time and two seasonal part-time positions, along with 3,500 hours in two job-share positions shared by eight individuals. The 12 full-time positions include the park manager, three park rangers, secretary, clerk, facilities supervisor and five conservation workers, two of which are full-time nine- and 10-month positions.

East Tennessee is becoming a destination for travelers throughout the country (Tennessee Department of Tourism, 2019). Tourism, including agriculture tourism, are significant economic drivers. Constructed almost a century ago, the park provides the geographic with features (i.e., topography, water and historical) that tourism seeks. As the park's resources are developed and advertised, additional tourists are expected to venture to the region. Improvements to BRSP can help support increased economic activity in Union County, along with Anderson, Knox and Grainger Counties.

The remainder of this paper outlines how 1) economic impacts are estimated using an IMPLAN economic input-output model; 2) current park economic impacts were estimated, including current economic impacts from the park (from park operations expenditures and visitor expenditures) (Section 2.2); 3) economic impacts (one-time) from investment in improvements to the park were calculated (Sections 2.3-2.4); and 4) economic impacts from the growth in visitors to the park were calculated (Section 2.5). The paper concludes with an overview of these economic impacts to the four-county area (Section 3).

2. ECONOMIC IMPACT ANALYSIS

2.1 HOW WERE THE ECONOMIC IMPACTS ESTIMATED?

There are three levels of economic impacts estimated in this analysis. The first determines the current level of economic impact that BRSP generates in the four-county region. This impact includes the current budget of the park and its level of spending, along with the expenditures of visitors. The second level includes the impact of the investment spending on the region's economy. The final level is the impact of the additional visitors that are likely to visit the park once the investments are made. Each contributes to the economic welfare of the study region. The first and the third levels are continuous year-to-year impacts, while the second occurs one time when the investments are made. Increased visitors and structural improvements are incorporated in the study; however, the BRSP operating budget was not increased to reflect additional management and maintenance needs that will occur as investment-based improvements are developed (including new activities such as a bike trail and water trail).[1]

1 "A water trail is a designated route along a lake, river, canal or bay specifically designed for people using small boats like kayaks, canoes, single sailboats or rowboats. The trails, sometimes called "blueways," are the aquatic equivalent of a hiking trail (or "greenway")." (Michigan Water Trails, Webpage, 2020).

IMPLAN, an economic input/output model, representing the four-county economy in 2018 is used (IMPLAN, 2018). This model includes over 540 industries that are classified based on the North American Industry Classification System (NAICS), and it measures the economic transaction (buying/selling) relationships between industries in the economy. For each economic impact activity analyzed, IMPLAN estimates the regional transactions. From these estimated transactions, IMPLAN projects economic activity using the model's multipliers.[2] This analysis uses IMPLAN's local purchase percentage (LPP) option. Instead of a 100 percent direct expenditure value (i.e., cabin improvement costs) applied to the multiplier, the model will reflect current local purchase splits within and outside the study region. If an input is purchased outside the region, that transaction impact stops.

2.2 CALCULATIONS FOR ESTIMATING CURRENT ANNUAL ECONOMIC IMPACTS

Annual expenditures for BRSP includes the day-to-day expenses for the park, plus visitors' expenditures. Keith Montgomery, park manager, provided 2017-2019 BRSP annual operating expenditures. Visitors' expenditures required estimating from secondary sources primarily because of budget issues and the study occurring during COVID-19.

a) BRSP Annual Operating Expenditures

The three-year average for BRSP's operating expenditures totaled $966,250 measured in 2018 dollars (2018$). Salaries comprised the largest portion at $616,992 with operating expenditures at $349,258. Expenditure items included travel, utilities, fuel, communications, shipping, printing/reproduction, building maintenance, insurance, office supplies and motor vehicle operations. These funds were used for park maintenance and to assist visitors. Salaries are estimated separately as their impacts occur as park employees buy goods and services in the local economy.

b) Visitors' Annual Expenditures

Visitors' annual expenditures estimates require an estimate of the numbers of annual visitors to the Park, along with the estimated expenditures per visitor. Vehicle counters placed at the two park entrances assist with these values. Wheel counts are divided by 2 (assuming two sets of wheels) and then multiplied by 3.28 (Montgomery, 2020) (based on survey data reported in the cited literature) to reflect the number of occupants within the vehicle. If a vehicle comes into the park and does not leave for seven days, it is only counted once. As an aside, the counter does not capture guests utilizing the Blue Mud boat ramp, which, according to the park superintendent, results in a significant number of visitors not included in the count (Montgomery, 2020).[3]

Visitor expenditure data is derived from a combination of sources: a survey conducted in 2009 of Tennessee state park users (English et al, 2009), a national forest visitor spending profile for local and nonlocal (i.e., people residing outside the four-county region) visitors (White, 2017), a report on the Ocmulgee National Historical Monument (Jensen, English, and Menard, 2017), and information from Keith Montgomery, BRSP Park Superintendent (Table 1). Expenses are delineated by type of outdoor recreational activity. BRSP personnel provided visitors participation rates in outdoor recreational activities. Visitors can participate in more than one recreational activity. Expenditures by activity type are summarized in Jensen, English, and Menard (2017). Visitor spending by activity type are estimated from a variety of sources:

2 Project-based spending "has a multiplier effect, as it is respent locally. The level of respending is based on how much local businesses and consumers buy from local businesses." (Hughes, p. 25, 2003)

3 In a previous park study (English et al. 2009), the traffic count was reduced by 0.63, based on a study of Texas State Parks (Kaczynski and Crompton 2003), adjusting for official vehicles or visitors re-entering the parks.

- Cycling recreational spending per visitor from Bowker, Bergstrom, and Gill (2004a);
- Paddler recreational spending per visitor from Bowker, Bergstrom, and Gill (2004b);
- Heritage tourist spending per visitor from Stynes (2006); and
- The remaining categories are based from Southwick and Associates (2014).

Table 1. Estimated Proportion of Visitors Participating in Big Ridge's Current Recreational Activities[a]

Recreational Activity	Proportion of Visitors Participating in the Recreational Activity	Proportion of Visitors That Are Local[b]
Biking	5%	75%
Canoeing	35%	50%
Camping	60%	65%
Fishing	15%	80%
Hiking	30%	60%
Historical	10%	50%
Swimming	65%	60%
Wildlife Watching	30%	50%

[a]Sum of percentages exceeds 100 percent, as visitors participate in more than one recreational activity.
[b]Local is defined as occurring within the study region.
Source: White 2017

From the 2009 Tennessee park study, the mean expenditure per visit was $128.64/trip (English, 2009). The values are adjusted to 2020$ using a GDP implicit price deflator, 1.20751 (calculated from the Federal Reserve Bank of St. Louis, 2020), for a value of $154.55/trip. Both local and nonlocal visitors recreate at the park. The division of local and nonlocal visitors requires information not readily available from secondary sources (see Table 1). Converting a per-trip estimate to a per-visitor estimate requires the $154.55 to be divided by 3.28 occupants per vehicle. Using the difference between local and nonlocal day expenditures (see White 2017), the average cost per visitor is estimated to be $47.12/day-visitor if local and $89.51/day-visitor if nonlocal.

Incorporating the information from Table 1, the daily expenses are then distributed to the consumptive expenditure items indicated in Table 2. The data indicates that estimated annual expenditures in the region to support recreational activity is about $50.0 million from visitors, with 57.6 percent generated from nonlocal visitors. It is assumed that direct local visitor spending ($21.2 million) would occur elsewhere regardless of the park and is not included in the analysis. Hence, the economic impact estimated from visitors' expenditures in this study is calculated using the nonlocal spending of $28.8 million only (Table 2).

Table 2. Local and Nonlocal Annual Expenditures at Big Ridge State Park (2020$)

Expenditure Category	Normalized Share Visitors	Nonlocal	Local	Total
Groceries and snacks	0.264	$7,626,651	$5,621,499	$13,248,150
Restaurant	0.132	$3,795,515	$2,797,622	$6,593,137
Fuel, oil	0.313	$9,025,101	$6,652,278	$15,677,379
Public transport (bus, taxi, airfare, etc.)	0.002	$49,474	$36,467	$85,941
Lodging	0.123	$3,552,834	$2,618,745	$6,171,579
Vehicle/equipment rental	0.010	$301,043	$221,895	$522,938
Other fees (launch/mooring, etc.)	0.016	$453,740	$334,445	$788,185
Bait	0.036	$1,048,999	$773,203	$1,822,201
Ammunition	0.064	$1,838,723	$1,355,297	$3,194,020
Souvenirs	0.022	$637,625	$469,985	$1,107,610
Entertainment (movies, nightclubs, etc.)	0.008	$234,709	$173,001	$407,710
Other trip related	0.009	$272,250	$200,672	$472,921
Total	***1.000***	***$28,836,663***	***$21,255,107***	***$50,091,771***

c) Current Economic Impact of the BRSP Budget and Visitors' Expenditures

The region is impacted by BRSP's operating expenditures and park salaries, as well as the impact the visitors create spending in the area for their BRSP-associated activities. The park spends approximately $966,250 (includes operating expenditures and salaries) per year to maintain park assets and assist visitors. For park expenditures (including salaries), the total economic impact (with multiplier effects) is $1.5 million in economic activity and supporting close to 7.0 jobs (Table 3). For nonlocal visitors' expenditures, the total economic impact (with multiplier effects) is $20.1 million in economic activity and supporting 197 jobs. Although nonlocal visitors' expenditures are estimated at $28.8 million (Table 2), the direct impacts to the region is $10.9 million. Therefore, the current total economic impact that the park has on the region is estimated at $21.7 million ($462,695+$1,115,757 +$20,129,336) as shown in Table 2. It should be noted that these are snapshots in time of economic impacts of BRSP park operating and nonlocal visitor expenditures at the park; however, these impacts are considered to be recurring (annually recurring). The top-five sectors in terms of economic activity and employment that are impacted by operating expenditures and by visitor expenditures are shown below in Table 3.

Table 3. Estimated Recurring Economic Impacts for Big Ridge State Park's Annual Operating Expenditures and Nonlocal Visitors' Expenditures (2020$)

Impact Type	Economic Activity	Employment
Non-salary Operating Expenditures		
Direct	$246,160	3
Total	$462,695	4
Salary Operating Expenditures		
Direct	$632,755	22[a]
Total	$1,115,757	25
Nonlocal Visitors		
Direct	$10,833,183	140
Total	$20,129,336	197
Total Impact	$21,707,788	
[a]Actual number of full- and part-time employees		

For:	*Top Five Industries Impacted for Economic Activity*	*Top Five Industries Impacted for Employment*
Operating Expenditures	• automotive repair and maintenance • services to buildings • water, sewage and other systems • electric power generation • retail – general merchandise stores	• automotive repair and maintenance • services to buildings • water, sewage and other systems • retail – general merchandise stores • office administrative services
Nonlocal Visitors	• limited-service restaurants • retail food and beverage stores • retail gasoline stores • full-service restaurants • retail sporting goods and hobby stores	• limited-service restaurants • retail food and beverage stores • retail gasoline stores • full-service restaurants • retail sporting goods and hobby stores

2.3 ESTIMATES OF INVESTMENT EXPENDITURES ON IMPROVEMENT AND ADDITIONS TO BRSP FACILITIES

BRSP investments in the park's assets is anticipated to increase visitation, along with expenditures within the region. As previously discussed, the park has 20 cabins, a group campground, a small amphitheater, swimming, individual campsites, hiking trails, an assembly hall with a kitchen, which is ideal for large group meetings/celebrations, a shelter for group picnics, and a large lake ideal for kayaking. This analysis evaluates the impact of the one-time expense of remodeling cabins, plus adding mountain bike trails, new restrooms, water trail with launch area, and campsites. BRSP estimates that cabin improvement for year-round occupancy would likely improve cabin rental revenues by 25 percent. Adding bike trails and a water trail would likely increase attendance by an estimated 15 to 25 percent. More visitors staying overnight as a result of park improvements will increase expenditures in the region. The analysis assumes the proportion of local to nonlocal visitors remains constant, but this might change once these new park improvements becomes known outside the

region. Because of the non-cabin improvements, the number of nonlocal visitors will likely increase to 370,500 and 402,700 for the 15 and 25 percent increases, respectively.

The one-time investment costs are presented in Table 4. A total of $7.3 million (2018$) is estimated to make the projected improvements. Investments for the kayak launches, campsites and restrooms were derived from the secondary cost information source published in *An Analysis of Potential Economic Impacts from the Proposed Ocmulgee National Park and Preserve* (English, Jensen, and Menard, 2017). For each direct expenditure estimated for new construction, a 7 percent architectural and engineering design fee was assigned to the 2018 total. The total cost for the engineering fee is $476,948 (2018$). More specifically, the estimated costs for the restrooms, campsites and kayak launches are:

- The estimated restroom cost was at $96,000 in 2015. For two restrooms, this totals to $192,000 or $209,953 in 2018$. The direct economic contribution was $224,650.
- Campsites are estimated to cost $64,800 in 2010$. The costs for campsites includes tent pads, fire ring and table. For three campsites, this totals to $194,000 or $247,098 in 2018$. The direct economic contribution is $264,395.
- The estimated cost for a concrete kayak launch would total $9,100 in 2008$ (700 sq. ft.). For two launches, that totals to $18,200 or $22,245 in 2018$. The direct economic investment is $23,802 (2018$).

BRSP personnel provided cost estimates for the proposed cabins. The 20 cabins are estimated to cost $200,000 each to renovate, resulting in a total investment of $2,568,000 (assumes an architectural and engineering design fee of $168,000 (7 percent)). For the proposed new bike trail(s), the secondary source, Norris Lake Area Trail Sustainability and Connectivity Study, was used. In this publication, there is a high (High) and low (Low) bike trail cost estimate. The study proposes 39.2 miles of new bike trails with costs ranging from a low of $406,245 and to a high of $3.5 million, or $10 thousand to $90 thousand per mile.

Table 4. Estimated Direct Costs for Proposed Construction Activity in Big Ridge State Park

Park Feature	Quantity	Estimated Cost/Unit	Total Cost (not adjusted to 2018$)	Inflated Direct Value in 2018$[a]	Design Fee in 2018$[b]	Total Direct Cost in 2018$
Restrooms[c]	2	$96,000 (2015$)	$192,000	$209,953	$14,697	$224,650
Campsites[c]	3	$64,800 (2010$)	$194,000	$247,098	$17,297	$264,395
Kayak Launch[c]	2	$9,100 (2008$)	$18,200	$22,245	$1,557	$23,802
Cabins[d]	12	$200,000	$2,400,000	$2,400,000	$168,000	$2,568,000
Bike Trail (Low)[e]	39.2	$10,363	$406,245	$406,245	$28,437	$434,682
Bike Trail (High)[e]	39.2	$90,000	$3,528,000	$3,528,000	$246,960	$3,774,960
Total (Low)				$3,285,541	$229,988	$3,515,529
Total (High)				$6,407,296	$448,511	$6,855,807

[a]Based on GDP implicit price deflator.
[b]Includes a 7 percent architectural and engineering design fee of the 2018$ total for each park feature.
[c]English, Jensen, and Menard, 2017.
[d]Keith Montgomery, 2020.
[e]Norris Lake Area Trail Sustainability and Connectivity Study.

2.4 ESTIMATED ECONOMIC IMPACTS FROM BRSP INVESTMENT

Table 5 indicates the estimated economic impacts for new construction at BRSP. Total estimated economic impacts (with multiplier effects) are estimated at close to $15.0 million (2020$) and 135 jobs. The top five industries impacted for economic activity and employment for each construction activity is detailed below in Table 5.

Table 5. Estimate of Economic Impacts for Proposed Construction Activity in Big Ridge State Park (2020$)

Impact Type	Economic Activity*	Jobs
Cabins		
Direct	$2,550,607	21
Total	$4,436,552	32
Bike Trails (Low)		
Direct	$431,442	6
Total	$964,248	9
Bike Trails (High)		
Direct	$3,748,889	53
Total	8,378,591	82
Water Trail – Kayak Launches		
Direct	$24,568	0
Total	$54,906	1
Water Trail – Campsites		
Direct	$272,898	4
Total	$609,900	6
Restrooms		
Direct	$231,875	3
Total	$518,217	5
Total[a]		
Direct Range (Low to High)	***$3,511,390 to $6,828,837***	***34 to 81***
Total Range (Low to High)	***$6,583,823 to $13,998,166***	***81 to 126***

* The analysis used the local purchase percentage (LPP) option available in IMPLAN modeling. Instead of a 100 percent direct expenditure value applied to the multiplier, the model is set to the value, which reflects purchases within the study region.
[a] Depending on the low and high estimates for the bike trails.

For:	Top 5 Industries Impacted for Economic Activity	Top 5 Industries Impacted for Employment
Cabins	• construction of new commercial structures • owner-occupied dwellings • other real estate • hospitals • other durable goods merchant wholesalers	• construction of new commercial structures • other real estate, restaurant (both full- and limited-service) • hospitals • truck transportation
Bike Trails	• construction of new nonresidential structures • owner-occupied dwellings • other real estate • hospitals • architectural, engineering and related services	• construction of new nonresidential structures • retail-building material and garden supply stores • full-service restaurants • other real estate • limited-service restaurants
Kayak Launch	• construction of new nonresidential structures • architectural, engineering and related services • owner-occupied dwellings • other real estate • hospitals	• construction of new nonresidential structures • architectural, engineering and related services • full-service restaurants • retail-building material and garden equipment and supplies stores • other real estate
Campsites	• construction of new nonresidential structures • architectural, engineering and related services • owner-occupied dwellings • other real estate • hospitals	• construction of new nonresidential structures • architectural, engineering and related services • full-service restaurants • retail-building material and garden equipment and supplies stores • other real estate
Restrooms	• construction of new nonresidential structures • architectural, engineering and related services • owner-occupied dwellings • other real estate • hospitals	• construction of new nonresidential structures • architectural, engineering and related services • full-service restaurants • retail-building material and garden equipment and supplies stores • other real estate

2.5 ESTIMATED ECONOMIC IMPACTS FROM INCREASED VISITORS

As previously indicated, these investments will likely increase numbers of visitors enjoying BRSP. Estimated increases in numbers of individuals using the state park range from 15 to 25 percent from the level currently visiting. In addition, cabin rentals are projected to increase 25 percent once the renovations are completed. As indicated by Keith Montgomery, improvement of the bike trail will increase visitation by 10 percent and the water trail by 5 percent. Therefore, an increase of nonlocal visitors of 15 percent has a direct impact of $12.5 million or an increase of $1.6 million per year once the renovations and improvements are completed. This results in a total increase in the region's economy of $23.1 million or a change of $3 million in the region's economy. If a 25 percent increase in park attendance occurs, the visitor expenditures will increase direct economic activity by $2.7 million, and, with multiplier effects included, a change in impact of $5.0 million is estimated to occur.

3. SUMMARY AND CONCLUSIONS

Three types of economic impacts are estimated in this analysis – the current level of impacts, the impact of the projected investments, and the impact of attracting new visitors as a result of the investments. The current impact consists of BRSP expenditures and those of the visitors. It is estimated that the current impact level to the four-county region consisting of Anderson, Grainger, Knox and Union Counties is $21.7 million. By a one-time investment of $7.3 million in the parks assets, another $3 million to $5 million economic impact could result each year to the regional economy through the attraction of nonlocal visitors. In addition, the investment of $3.5 million to $6.8 million would provide a one-time economic impact to the region of $6,583,823 to $13,998,166, depending on whether the low or high bicycle trail estimate is used. It is important to note that this study has several limitations. First, the study represents a snapshot in time, while some economic impacts might change through time. For example, the multiplier effects could change because of the investments. An increase in visitors to BRSP might have a significant increase in demand for local businesses, such as bike and kayak rentals, plus local businesses catering to visitors. A renovated assembly hall and kitchen might see a significant increase in demand for weddings and/or other group venues. If this occurs, the catering industry might grow. Paddleboats on the lake might be in demand. The concession industry might locate some businesses in or near the park. A place to stay outside the park, such as a small hotel, might also be in demand. These types of private investments could occur as a result of park improvements but are not included in our analysis. Second, the study is based on sets of assumptions as outlined throughout this paper. As these assumptions are changed, of course, so would the estimates of economic impacts.

IMPLAN Metrics: ***Total Industry Output*** – annual dollar value of goods and services that an industry produces; a measure of economic activity. ***Employment*** - the estimated number of total wage and salary employees (both full- and part-time), as well as self-employed. ***State/Local Taxes*** – consists of sales taxes, property taxes, motor vehicle licenses taxes, severance taxes and other taxes.

Impact Types: ***Direct Impacts*** — the estimated economic impacts of activities from constructing cabin and/or bike trails. ***Total Impacts*** — the sum of direct impacts plus the estimated multiplier impacts (from businesses purchasing inputs and supplies and households spending the economy).

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