

## Approximating the economic impact of visitor spending at TVA stream sites



Submitted to:

S. Clay Guerry  
Tennessee Valley Authority  
400 W. Summit Hill Dr. WT-11A  
Knoxville, TN 37902  
Tel: 865-632-1334  
Email: [scguerry@tva.gov](mailto:scguerry@tva.gov)

Submitted by:

Dr. Neelam C. Poudyal  
Associate Professor  
Department of Forestry, Wildlife, & Fisheries  
University of Tennessee  
Knoxville, TN 37996  
Tel: 865-974-8771  
Email: [npoudyal@utk.edu](mailto:npoudyal@utk.edu)

April 14, 2021

## Summary

This report presents the results from extrapolation of recreation use estimates and economic impact and contribution estimates generated from selected stream access sites within TVA region in a recently conducted study. Average estimates of use and economic impacts were first computed at the site level for each types (High, Medium, Low) and then aggregated to the population of sites within each type category. Recreation use (total visitors, day vs. overnight users, local vs. non-local users) and economic metrics (e.g., spending, jobs, labor income, value added) from all use categories were then added to derive the total recreational use and economic contribution of visitor spending at all stream access sites in the entire TVA region. Total number of annual recreational visitors in the region was estimated to be 565,663. About 57% of total visitors were local day visitors whereas the other 41% were non-local day or overnight visitors. Direct spending by both local and non-local visitors at stream access in the entire TVA region resulted in \$44.43 million in direct and secondary effects, supported a total of 624 full and part-time jobs, and contributed \$13 million in labor and personal income. Local and non-local visitor spending led to \$25.42 million contribution in the region's GDP. These statistics demonstrate the significance of stream site use for recreation and lend support for continuous investment of resources to maintain these sites for recreational use. While this report highlights the economic contribution of visitor spending to the local communities, future study may quantify the economic value of recreational benefit enjoyed by the visitors themselves, which could also be critical in fully understanding the public value of maintaining stream site access in the TVA region.

## **Background**

Visitors at reservoirs, lakes and streams within TVA region annually spend substantial amount of money in food, gasoline, restaurant, lodging and other items while recreating in those areas. The initial spending injected by local and non-local visitors into these rural counties ripple through the local economy and create direct and indirect expenditures and lead to added output, jobs, and tax revenues. Promoting outdoor recreation to benefit local communities is important to achieving TVA's enduring mission of promoting economic development, and fostering environmental stewardship. Sustaining outdoor recreational use of stream access sites on TVA lands and facilities, and its associated economic impact on surrounding counties requires a good understanding of the pattern and trends in use (participation, recreation user days etc.) and the economic impacts created by recreation expenditure. In this context, this report presents the outcome from an extrapolation work carried out in approximating the total economic contributions and economic impacts of visitor expenditures at stream access sites.

### **Project Objectives:**

The objectives of this project was to:

1. Extrapolate the visitor spending and economic impacts estimated at select stream sites to the entire TVA region.

### **Approach:**

The aforementioned objective was achieved with activities in two stages. The first stage involved reviewing the UGA study data and reports provided by TVA (Boley et al. 2019, 2020). These two reports, compiled by University of Georgia and USDA Forest Service for TVA and made available by TVA to the University of Tennessee Institute of Agriculture (UTIA) team,

contained visitor expenditure and economic impact estimates generated from economic input-output analysis at select stream access sites sampled in Georgia, North Carolina (Phase I) and Tennessee and Virginia (Phase II). Since there are multiple sites of various level of recreation use (high, medium, low) in the UGA study, the spending and impact metrics were characterized for site types of each level of use. In other words, the totals of estimated use (e.g., visits, days) and economic metrics (e.g., spending, direct and secondary effects on jobs, value added) from sampled sites were apportioned to individual use level groups and then divided by the number of sites of each use level in each group to derive these metrics in average per site unit (e.g. average spending per low use site, average jobs per medium use site).

The second stage involved extrapolating the use and economic metrics to the population of stream access sites in the region. Average estimates derived for each site type groups (H, M, L) based on data collected from a total of 21 samples sites during the 2019 and 2020 recreation seasons (Boley et al., 2019, Boley et al, 2020) were used to extrapolate the estimates to all sites within each group. Estimated numbers at each site groups were then summed up to get regionwide estimates. This was achieved by first working with TVA officials in inventorying and tabulating the total number of stream access sites in the region and then systematically extrapolating the average estimates of use and economic metrics per site from the UGA study. As a result, the tables and infographic presented in this report highlight the estimated total recreation use, economic contributions and impacts of visitor spending at 63 stream access sites in the entire TVA region.

## Results

A list from complete inventory of stream access sites in the entire TVA region is presented in Table 1. Based on the current use level and recent trends and other factors pertinent to the visitor volume at those sites, each site was classified as High (H), Medium (M) and Low (L). Accordingly, there were 25, 19 and 19 sites classified as High, Medium and Low use respectively.

Table 1: Complete list of stream access sites in TVA region by use level

Site Name	Acres	Stream Name	River Mile	County	State	Use level
Blue Ridge Dam TW	2.28	Toccoa R	53	Fannin	GA	M
Curtis Switch	4	Toccoa R	7.60	Fannin	GA	H
Dyer Bridge	2.4	West Chickamauga	6.60	Catoosa	GA	L
Tammen Park		Toccoa R		Fannin	GA	H
Shallowford Bridge	1.1	Hiwassee R	108.30	Clay	NC	L
Gee Creek		Hiwassee R	43.10	Polk	TN	H
Bealtown	2.06	Hiwassee R	96.50	Cherokee	NC	M
Below Chatuge Weir Access	2.38	Hiwassee R	118.90	Clay	NC	L
Bryson City	17.4	Tuckasegee R	11.60	Swain	NC	H
Flanary Bridge	2.42	Powell R	130.60	Lee	VA	L
Dungannon	1.18	Clinch R	237.30	Scott	VA	M
Stateline	0.7	Clinch R	202.70	Scott	VA	L
Clinchport	24.9	Clinch R	213.50	Scott	VA	M
St. Paul	0.87	Clinch R	255	Wise	VA	H
Carterton	0.6	Clinch R	264	Russell	VA	L
Nash Ford	3.26	Clinch R	279.50	Russell	VA	L
Puckett's Hole	4.64	Clinch R	288	Russell	VA	L
Blackford Bridge	1.9	Clinch R	296	Russell	VA	M
Crabtree	1.8	Doe R	18.20	Carter	TN	L
Hale Bridge	2.45	Nolichucky R	28	Greene	TN	L
Nolichucky Dam TW	5.44	Nolichucky R	46	Greene	TN	M

Bird Bridge	0.58	Nolichucky R	50.20	Greene	TN	M
Jones Bridge	33.30	Nolichucky R	54.1	Greene	TN	L
Kinser Bridge	9.4	Nolichucky R	54.1	Greene	TN	L
New Glaze Bridge	1.2	Nolichucky R	70.5	Washington	TN	L
Christian's Bend	0.7	Holston R	127	Hawkins	TN	M
Mulberry Creek Bridge	1.62	Powell R	103.20	Hancock	TN	M
Brooks Bridge	0.4	Powell R	95.10	Claiborne	TN	L
Flat Rock Ford	0.9	Crab Orchard Cr	10.60	Morgan	TN	L
Twin Bridges	1.1	White Cr	6.90	Morgan	TN	L
Ela	1.46	Tuckasegee R	17.60	Swain	NC	M
Cullowhee Dam	1	Tuckasegee R	41	Jackson	NC	M
East LaPorte	4.6	Tuckasegee R	46.20	Jackson	NC	H
Miller Island	13.1	Clinch R	77.10	Anderson	TN	H
Norris Weir	0.36	Clinch R	77.90	Anderson	TN	H
Norris TW	3.88	Clinch R	79.70	Anderson	TN	H
Prentiss Bridge	1.36	Little Tennessee R	122.50	Macon	NC	M
Phillips Bridge	2.17	Little Tennessee R	117.50	Macon	NC	M
Peery's Mill	2.79	Little R	22	Blount	TN	H
Highway 5	1.4	Bear Cr	114	Marion	AL	H
Mill Creek	6	Bear Cr	111.60	Marion	AL	M
Golden Bridge	1.43	Bear Cr	50.4	Tishomingo	MS	M
Bear Creek Ford	3.8	Bear Cr	31.8	Tishomingo	MS	M
Scott Bridge	143	Bear Cr	89.30	Franklin	AL	M
Military Bridge	20	Bear Cr	95.70	Franklin	AL	H
Rock Quarry Branch	25.61	Bear Cr	104.7	Marion	AL	H
Green Island	14.97	Duck R	224.1	Bedford	TN	L
Mullins Mill Bridge	6.19	Duck R	235.5	Bedford	TN	H
Three Forks Bridge	3.68	Duck R	239.80	Bedford	TN	H
Dement Bridge	3.5	Duck R	243.10	Bedford	TN	H
Normandy Dam TW	10.37	Duck R	248.40	Bedford	TN	H
Caney Creek	8.3	Ocoee R	19.60	Polk	TN	H
Ocoee #2 TW	4.5	Ocoee R	24.10	Polk	TN	H
Sugarloaf Park	1	Ocoee R	11.8	Polk	TN	H
South Holston	3.1	SF Holston R	48.2	Sullivan	TN	H
Chennault Ford	1.03	Elk R	97	Lincoln	TN	L

Stump Shoals	2.1	Elk R	103.30	Lincoln	TN	L
Shiloh Bridge	1.1	Elk R	112.50	Lincoln	TN	M
Sullenger Bend	151	Elk R	115	Lincoln	TN	M
Old Dam Ford	0.33	Elk R	119.30	Moore	TN	H
Farris Creek Bridge	4.8	Elk R	124.40	Franklin	TN	H
Tims Ford TW	4.5	Elk R	133	Franklin	TN	H
Wilbur TW	2.91	Watauga R	33.90	Carter	TN	H

**Recreation Visits:** Analysis of site level estimates from 21 sampled sites showed average visit to be 17,852 for High, 4,246 for Medium and 2,036 for Low use sites. Accordingly, total annual recreational visits at all sites in the region was estimated to be 565,663. Majority of visitors (57%) are local day users. From economic standpoint, non-local visitors and their expenditures are important to general impact in local economy. About 41% of all visitors were either overnight or day users.

Table 2: Estimated total recreation visitors at 63 stream access sites in the TVA region by local and non-local and day and overnight uses

Visitor types	Numbers
Total recreation visitors	565,663
Non-local overnight visitors	163,673
Local day users	324,518
Non-local day users	69,333
Local overnight users	8,142

**Economic impacts of non-local visitor spending:** Average estimates of economic impacts from non-local spending was estimated at per site level by type of sites (H, M, L) and presented in table 3.

Table 3: Estimated average economic impacts of non-local visitor spending at TVA streamside access by site types, based on Phase I and Phase II data in UGA reports.

<b>Spending category</b>	<b>Sales</b>	<b>Jobs</b>	<b>Labor income</b>	<b>Value added</b>
<b><i>High use</i></b>				
Direct effect				
Motel, hotel, cabin, or B&B	\$400,301	4.475	\$101,972	\$212,557
Camping fees	\$20,294	0.225	\$5,355	\$8,464
Restaurants & bars	\$148,217	2.449	\$49,566	\$77,118
Admission fees	\$218,645	4.494	\$53,389	\$121,720
Entertainment	\$12,403	0.258	\$3,029	\$6,905
Other vehicle expenses	\$15,975	0.174	\$7,960	\$9,227
Local transportation	\$2,216	0.058	\$1,127	\$1,596
Grocery stores	\$24,836	0.441	\$12,226	\$17,996
Gas stations	\$24,647	0.400	\$9,298	\$16,818
Other retail	\$38,712	0.891	\$15,246	\$25,758
Wholesale trade	\$14,914	0.108	\$5,181	\$11,074
Local production of goods	\$2,427	0.001	\$322	\$553
<b>Total direct effects</b>	<b>\$925,911</b>	<b>13.97</b>	<b>\$264,982</b>	<b>\$510,322</b>
Secondary effects	\$314,958	2.75	\$87,153	\$180,696
<b>Total effects</b>	<b>\$1,240,869</b>	<b>16.72</b>	<b>\$180,696</b>	<b>\$691,018</b>
<b><i>Medium use</i></b>				
Direct effect				
Motel, hotel, cabin, or B&B	\$115,570	1.290	\$29,440	\$61,367
Camping fees	\$4,004	0.045	\$1,057	\$1,670
Restaurants & bars	\$41,257	0.683	\$13,797	\$21,467
Admission fees	\$38,527	0.792	\$9,408	\$21,448
Entertainment	\$3,237	0.067	\$790	\$1,802
Other vehicle expenses	\$3,282	0.035	\$1,635	\$1,896
Local transportation	\$714	0.018	\$363	\$514
Grocery stores	\$8,311	0.147	\$4,091	\$6,022
Gas stations	\$6,149	0.098	\$2,320	\$4,196
Other retail	\$10,427	0.236	\$4,147	\$7,012
Wholesale trade	\$4,270	0.031	\$1,484	\$3,171
Local production of goods	\$1,306	0.000	\$173	\$297
<b>Total direct effects</b>	<b>\$237,327</b>	<b>3.44</b>	<b>\$68,741</b>	<b>\$130,925</b>
Secondary effects	\$81,520	0.71	\$22,601	\$46,665
<b>Total effects</b>	<b>\$318,847</b>	<b>4.16</b>	<b>\$91,342</b>	<b>\$177,589</b>



<b>Low use</b>				
<b>Direct effect</b>				
Motel, hotel, cabin, or B&B	\$50,842	0.568	\$12,952	\$26,997
Camping fees	\$2,102	0.023	\$555	\$877
Restaurants & bars	\$18,432	0.305	\$6,164	\$9,590
Admission fees	\$21,468	0.441	\$5,242	\$11,951
Entertainment	\$1,487	0.031	\$363	\$828
Other vehicle expenses	\$1,688	0.018	\$841	\$975
Local transportation	\$300	0.008	\$153	\$216
Grocery stores	\$3,447	0.061	\$1,697	\$2,498
Gas stations	\$2,883	0.046	\$1,087	\$1,967
Other retail	\$4,725	0.108	\$1,871	\$3,163
Wholesale trade	\$1,885	0.014	\$655	\$1,400
Local production of goods	\$463	0.000	\$61	\$106
<b>Total direct effects</b>	<b>\$109,916</b>	<b>1.62</b>	<b>\$31,667</b>	<b>\$60,612</b>
Secondary effects	\$37,592	0.33	\$10,413	\$21,540
<b>Total effects</b>	<b>\$147,508</b>	<b>1.95</b>	<b>\$42,080</b>	<b>\$82,152</b>

Aggregated estimates of economic impacts at the TVA region level are presented in Table 4. Direct spending by non-local visitors in the entire region is estimated at \$29.74 million whereas the secondary effect on sales was additional \$10 million. Of note, the secondary effect corresponds to the sales occurring in the area as a result of the initial expenditures by the visitors. For example, when a visitor at Miller Island site dines in a local restaurant, it generates income and job for the restaurant operator (direct effect). The restaurant operator will purchase vegetables from local farmers and hire people from local area to work in her restaurant, thereby creating income and jobs to other in the area (secondary effect). While considering both direct and indirect effect, the visitor spending supported a total of 534 jobs and generated \$11.3 million in labor or personal income and contributed \$22.2 million in the region's GDP. The largest direct spending occurred in accommodation sector (i.e. motel, hotel,

cabin, or B&B) with \$13.16 million in direct sales, 147 direct jobs, \$3.3 labor or personal income, and \$6.9 million in value added.

Table 4: Estimated total economic impacts of non-local visitor spending at TVA streamside access points in the entire region

<b>Spending categories</b>	<b>Sales</b>	<b>Jobs</b>	<b>Labor income</b>	<b>Value added</b>
<b>Direct effects</b>				
Motel, hotel, cabin, or B&B	\$13,169,357	147	\$3,354,750	\$6,992,837
Camping fees	\$623,370	7	\$164,493	\$260,006
Restaurants & bars	\$4,839,524	80	\$1,618,404	\$2,518,035
Admission fees	\$6,606,053	136	\$1,613,071	\$3,677,585
Entertainment	\$399,833	8	\$97,632	\$222,589
Other vehicle expenses	\$493,793	5	\$246,058	\$285,211
Local transportation	\$74,669	2	\$37,979	\$53,787
Grocery stores	\$844,290	15	\$415,629	\$611,789
Gas stations	\$787,797	13	\$297,175	\$537,547
other retail	\$1,255,706	29	\$495,478	\$837,274
Wholesale trade	\$489,794	4	\$170,155	\$363,695
Local production of goods	\$94,281.65	0	\$12,513	\$21,474
<b>Total direct effects</b>	<b>\$29,745,398</b>	<b>446</b>	<b>\$8,532,306</b>	<b>\$16,397,241</b>
Secondary effects	\$10,137,076	89	\$2,806,089	\$5,813,291
<b>Total effects</b>	<b>\$39,882,474</b>	<b>534</b>	<b>\$11,338,395</b>	<b>\$22,210,535</b>

***Economic contributions of local and non-local visitor spending:*** Economic significance of visitor expenditure to a recreate site can also include the direct and indirect effect of spending by local visitors. Table 5 shows the average of economic contributions from local as well as non-local spending computed at per site level by type of sites (H, M, L).

Table 5: Estimated average economic contributions of local and non-local visitor spending at TVA streamside access by site types, based on Phase I and Phase II data in UGA reports

<b>Spending category</b>	<b>Sales</b>	<b>Jobs</b>	<b>Labor income</b>	<b>Value added</b>
<b><i>High use</i></b>				
Direct effect				
Motel, hotel, cabin, or B&B	\$400,301	4.475	\$101,972	\$212,557
Camping fees	\$21,707	0.264	\$5,728	\$9,054
Restaurants & bars	\$172,792	2.820	\$57,784	\$89,905
Admission fees	\$296,838	6.032	\$72,482	\$165,249
Entertainment	\$13,117	0.889	\$3,203	\$7,302
Other vehicle expenses	\$15,975	0.174	\$7,960	\$9,227
Local transportation	\$3,482	0.090	\$1,771	\$2,508
Grocery stores	\$33,375	0.582	\$16,430	\$24,184
Gas stations	\$32,971	0.524	\$12,437	\$22,497
Other retail	\$50,400	1.225	\$19,596	\$33,071
Wholesale trade	\$19,968	0.129	\$6,937	\$14,827
Local production of goods	\$6,350	0.001	\$846	\$1,453
Total direct effects	\$1,067,274	17.220	\$307,147	\$591,834
Secondary effects	\$359,803	3.120	\$99,284	\$206,910
Total effects	\$1,427,077	19.790	\$406,431	\$798,744
<b><i>Medium use</i></b>				
Direct effect				
Motel, hotel, cabin, or B&B	\$115,570	1.290	\$29,440	\$61,367
Camping fees	\$4,765	0.057	\$1,257	\$1,987
Restaurants & bars	\$45,923	0.752	\$15,357	\$23,894
Admission fees	\$48,977	0.971	\$11,959	\$27,266
Entertainment	\$3,352	0.402	\$819	\$1,866
Other vehicle expenses	\$3,282	0.035	\$1,635	\$1,896
Local transportation	\$861	0.022	\$438	\$620
Grocery stores	\$10,084	0.178	\$4,964	\$7,307
Gas stations	\$7,545	0.120	\$2,846	\$5,148
Other retail	\$12,272	0.290	\$4,834	\$8,168
Wholesale trade	\$5,177	0.033	\$1,799	\$3,844
Local production of goods	\$1,905	0.000	\$253	\$435
Total direct effects	\$259,714	4.150	\$75,602	\$143,797
Secondary effects	\$88,731	0.770	\$24,556	\$50,879
Total effects	\$348,444	4.630	\$100,158	\$194,677

<b>Low use</b>				
<b>Direct effect</b>				
Motel, hotel, cabin, or B&B	\$50,842	0.568	\$12,952	\$26,997
Camping fees	\$2,372	0.028	\$626	\$989
Restaurants & bars	\$20,931	0.342	\$7,000	\$10,891
Admission fees	\$28,293	0.569	\$6,909	\$15,751
Entertainment	\$1,555	0.150	\$380	\$865
Other vehicle expenses	\$1,688	0.018	\$841	\$975
Local transportation	\$405	0.010	\$206	\$292
Grocery stores	\$4,354	0.077	\$2,143	\$3,155
Gas stations	\$3,682	0.059	\$1,389	\$2,512
Other retail	\$5,818	0.139	\$2,278	\$3,847
Wholesale trade	\$2,386	0.015	\$829	\$1,771
Local production of goods	\$825	0.000	\$110	\$188
<b>Total direct effects</b>	<b>\$123,150</b>	<b>1.98</b>	<b>\$35,661</b>	<b>\$68,234</b>
Secondary effects	\$41,818	0.36	\$11,558	\$24,010
<b>Total effects</b>	<b>\$164,968</b>	<b>2.24</b>	<b>\$47,219</b>	<b>\$92,244</b>

Total economic contribution of spending by both local and non-local users are extrapolated for the entire TVA region and presented in Table 6. Direct spending by both types of users totaled \$33.95 million, which rippled through the local economy and created additional \$11.47 millions in sales, resulting into \$44.43 million in total effect. These economic activities supported 547 direct jobs and 99 additional jobs totaling 624 jobs and generating \$12.96 million in labor and personal incomes. The total contribution of local and non-local visitor spending in the TVA region's GDP was \$25.42 million. The largest direct spending occurred in accommodation sector (i.e. motel, hotel, cabin, or B&B) with \$13.16 million in direct sales, 147 direct jobs, \$3.3 labor or personal income, and \$6.9 million in value added. While the economic effect of visitor spending in this category did not change by adding local visitor's spending,

many other sectors such as restaurants, camping, entertainment, grocery, gas station, and other retails saw remarkably higher effect.

Table 6: Estimated total economic contributions of local and non-local visitor spending at TVA streamside access points in the entire region

<b>Spending categories</b>	<b>Sales</b>	<b>Jobs</b>	<b>Labor income</b>	<b>Value added</b>
<b>Direct effects</b>				
Motel, hotel, cabin, or B&B	\$13,169,357	147	\$3,354,750	\$6,992,837
Camping fees	\$678,262	8	\$178,978	\$282,902
Restaurants & bars	\$5,590,036	91	\$1,869,385	\$2,908,532
Admission fees	\$8,889,088	180	\$2,170,547	\$4,948,549
Entertainment	\$421,167	33	\$102,844	\$234,462
Other vehicle expenses	\$493,793	5	\$246,058	\$285,211
Local transportation	\$111,092	3	\$56,500	\$80,023
Grocery stores	\$1,108,682	19	\$545,784	\$803,367
Gas stations	\$1,037,573	16	\$391,395	\$707,984
other retail	\$1,603,705	39	\$625,041	\$1,055,050
Wholesale trade	\$642,891	4	\$223,346	\$477,376
Local production of goods	\$210,619	0	\$28,049	\$48,153
<b>Total direct effects</b>	<b>\$33,956,258</b>	<b>547</b>	<b>\$9,792,668</b>	<b>\$18,824,447</b>
Secondary effects	\$11,475,497	99	\$3,168,259	\$6,595,651
<b>Total effects</b>	<b>\$45,431,755</b>	<b>625</b>	<b>\$12,960,927</b>	<b>\$25,420,098</b>

## Conclusions and Recommendations

Extrapolation of visitor use and economic contributions from sampled sites to the entire TVA region suggest that the stream site access points are important recreation amenities for hundreds of thousands of outdoor enthusiasts in the region. While local visitors make a significant proportion of estimated visitors in the region (565,663), slightly half of the users are non-local, which could bring substantial spending to inject in local economy and help boost

income generation opportunities and create jobs. When we consider the spending of both local and non-local visitors, the spending by TVA stream site users contribute an estimated \$45 million in total sales, support 625 jobs, generate \$12.96 million in labor or personal income. This contribution translates to a total of \$25.42 million in the region's GDP. These statistics demonstrate the significance of stream site use for recreation and lend support for continuous investment of public resources to maintain these sites for recreational use.

A few caveats and recommendation for future study should be noted. The extrapolation of site use and economic impact metrics presented in this report is based on the results obtained from selected sample sites in UGA study. Therefore, it is assumed that the sites in the sample were representative of high, medium, and low use sites in the entire region. Second, according to TVA recreation specialists collaborating on this project, the two years of data collection at the 21 stream access sites occurred during unusually high rainfall and runoff and higher than average water during likely had a negative affect on use. In addition, data collected in 2020 occurred at the beginning of the COVID 19 pandemic when travel was restricted in many areas. These two factors could have impacted the estimation of use and economic contribution, compared to other periods.

Finally, the economic contribution or impact estimates presented in this report only quantify the economic significance of benefit from visitor spending to the local communities. It does not capture the total economic benefit of recreation access enjoyed by hundreds of thousands of stream site users in the region. In other words, this economic analysis does not include the recreational value or the benefit to the users themselves. Understanding the total economic significance of recreation at TVA stream sites will require conducting a non-market

economic valuation of access to these sites. Economic studies that have quantified both the recreational benefit to visitors and economic impact to the local communities have shown that the economic benefit to the recreational users could be substantial and should be accounted for in any decisions regarding resources management. Hence, an economic valuation of recreational benefit to the users of stream sites as well as TVA reservoirs is recommended for future study.

## **References**

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