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Estimated Economic Impacts of Ocoee Whitewater Rafting on the Local Economy

Background

The Cherokee National Forest is located in the southeastern United States and within its boundaries flows the Hiwassee River and its tributaries the Ocoee and Nottely Rivers. In Polk County, which is located in the southeastern corner of Tennessee, the Ocoee River joins the Hiwassee River near the town of Benton (Figure 1). The Tennessee Valley Authority controls the flow of the Ocoee with the use of three dams. The dams are numbered sequentially with dam number one being the farthest downstream and dam number three being the farthest upstream. The three dams are capable of generating an average of 67,000 kilowatts of electricity. Among the many recreational opportunities available in the Cherokee National Forest, Ocoee whitewater rafting is popular among recreational users. In fact the whitewater slalom events for the 1996 Summer Olympic Games were conducted on a one-mile stretch whitewater course that was fed by releases of water from the third dam (Wikipedia, 2013).

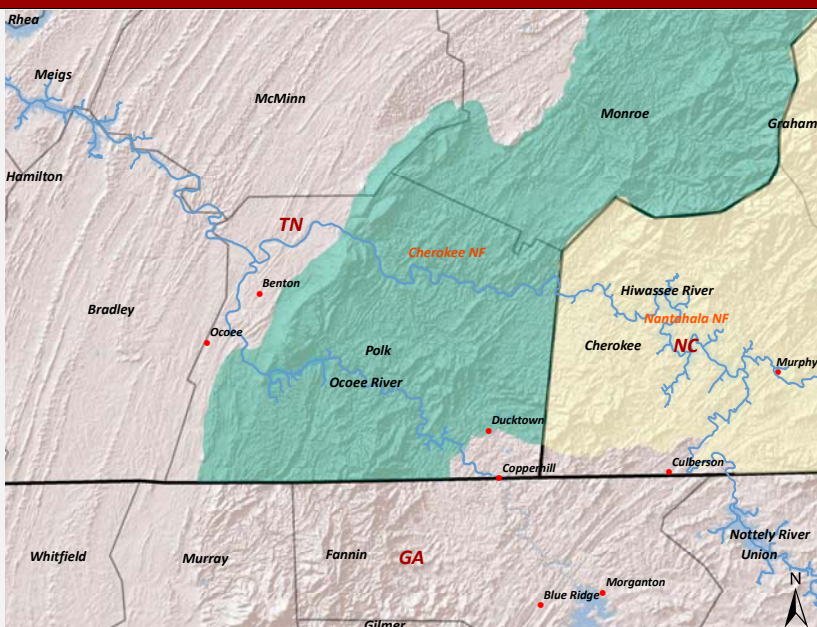


Figure 1. Location of the Ocoee River in the Cherokee National Forest in Southeast Tennessee.

The purpose of this study is to estimate the economic impacts of whitewater rafting on the Ocoee for the local economy. From June 8 through September 20, 2012, a survey (Appendix A) was conducted of whitewater rafting users along the upper and lower Ocoee River. One part of the survey included questions for Ocoee River whitewater rafters concerning their trip expenditures within sixty miles of the Ocoee to provide input for estimating their economic impacts. When survey responses are given throughout this document, “N” represents the total number of responses to a particular question. For the economic impact analysis, the economic region analyzed comprised of 31 counties located in Georgia, North Carolina, or Tennessee (Figure 2). Based on 2010 IMPLAN data, which is used in this analysis, tourism represents roughly 3.3 percent (\$3.4 billion) of the total economy (\$102.5 billion) and 8.2 percent (60,426 jobs) of the total workforce (734,783 jobs) for the study area. Tourism industries tracked by IM-



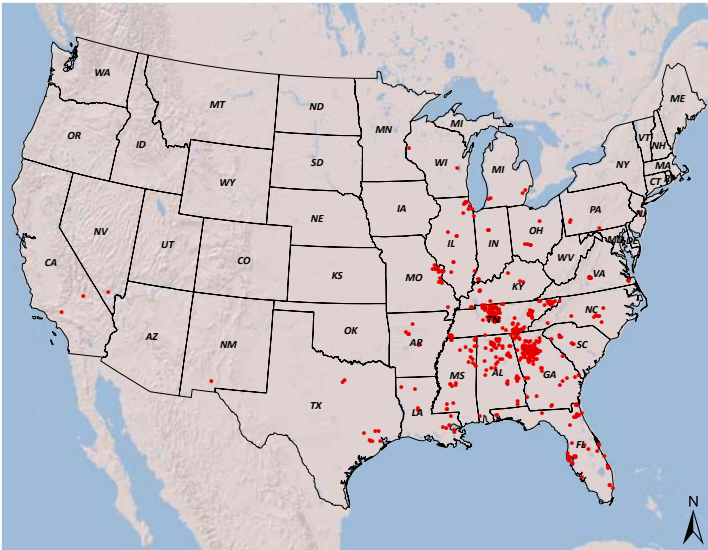


Figure 3. Origin of Residence of Whitewater Rafting Users of the Ocoee--U.S. Perspective.

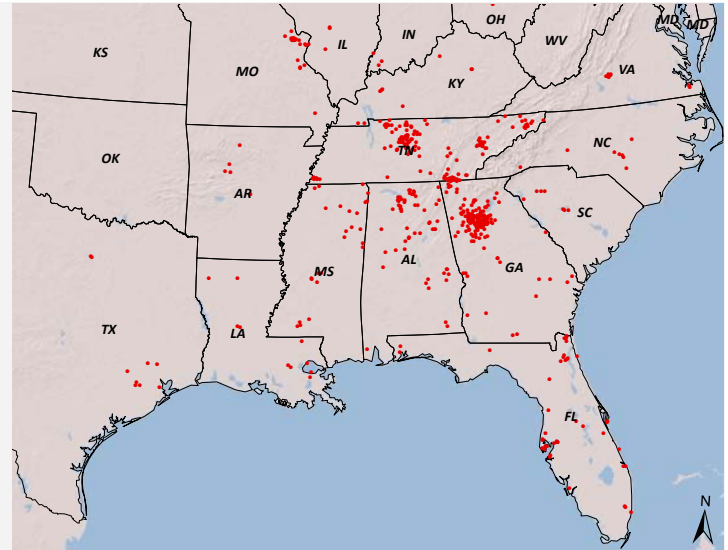


Figure 4. Origin of Residence of Whitewater Rafting Users of the Ocoee--Southeast Perspective.

Table 2. Average Trip Expenditures per Group for Whitewater Rafter Within 60 Miles of the Ocoee, 2012		
Question	Mean	Range
5) <i>Approximately how much did you spend on lodging per night? (N=307)</i>	\$97.72	\$0 to \$1,200
6) <i>Approximately how much will your total party or group spend during your entire visit (all days) to the Ocoee River area? (N=471)</i>	\$680.26	\$25 to \$9,100
7) <i>Approximately how much will your party or group spend during your visit (all days) to the Ocoee River in the following categories:</i>		
<i>Total for rafting trip, recreation fees, parking fees and admissions (N=455)</i>	\$305.10	\$0 to \$4,000
<i>Total for food and beverages (including restaurants, bars, grocery stores) (N=455)</i>	\$133.62	\$0 to \$1,000
<i>Total for transportation (N=455)</i>	\$93.43	\$0 to \$1,000
<i>Total for souvenirs, T-shirts, hats, clothes, and sunscreen (N=455)</i>	\$55.39	\$0 to \$500

average spent on overnight lodging (Table 2). For the entire trip to the Ocoee, the average value spent was \$680.26, with twelve groups spending \$2,500 or more. For the rafting trip, recreation fees, parking fees and admissions the average spent was close to \$305.10. Food and beverages, transportation, and souvenirs average expenditures were \$133.62, \$93.43, and \$55.39, respectively. The most frequent responses to income categories were \$160,000 or more at 14.94 percent, followed by \$60,000 to \$79,999 (14.02 percent), and \$40,000 to \$59,999 (13.79 percent) income categories. Approximately 37.70 percent of the whitewater rafters had income levels greater than \$100,000. The majority of the whitewater rafters had four year college degrees or better (61.48 percent).

Economic Impacts

In order to calculate the estimated economic impacts, an estimate of the average trip expenditure per Ocoee whitewater rafter is needed. Based on the raw data, total expenditures (Question 6 in the survey) summed to \$320,402 for 3,118 whitewater rafters, which represents an average expenditure of \$102.76 (\$112.38 if lodging expenditures from Question 5 are assumed to not be in the totals for Questions 6 and 7) per whitewater rafter. The data on expenditures in Table 2 were adjusted to account for those with zero expenditures to arrive at



Question	Direct Impacts
5) <i>How much did you spend on lodging per night (N=307)?</i>	\$5,015,493
7) <i>Approximately how much will your part or group spend during your visit (all days) to the Ocoee River in the following categories:</i>	
<i>Total for rafting trip, recreation fees, parking fees and admissions (N=455)</i>	\$12,064,728
<i>Total for food and beverages (including restaurants, bars, grocery stores) (N=455)</i>	\$5,800,526
<i>Total for transportation (N=455)</i>	\$4,033,053
<i>Total for souvenirs, T-shirts, hats, clothes, and sunscreen (N=455)</i>	\$2,520,371
Total	\$29,434,171

average expenditures across all Ocoee whitewater rafters. The average per trip expenditure (using Question 5 and sub-categories in Question 7) per whitewater rafter was then estimated and multiplied by the number of river users in 2012, which was 229,542 (Moates, 2012), to determine the direct expenditures for IMPLAN analysis (Table 3). Lodging expenses were added to those detailed in Question 7 to derive the totals across these categories.

Using IMPLAN 2010 data, the estimated level of direct expenditures for the Ocoee whitewater rafters was \$29.4 million (\$26.8 million after using the local purchase percentage (LPP) option in IMPLAN and inflating to 2012\$) (Table 4) (see Appendix B). This expenditure level is responsible for 477.1 direct jobs. The direct labor income earned is \$8.7 million. The direct value added impact is \$15.9 million. The indirect impact on the output of all the local suppliers for recreational users is \$7.9 million. The induced output impact, the impact of the wages being spent by workers producing the direct and indirect effect, is \$9.1 million. The estimated total output impact is close to \$43.8 million. Total employment impact is 622 jobs. For labor income, the total effect is \$14.1 million. For value added and indirect business taxes, the total estimated impacts are \$26.1 million and \$3.6 million, respectively. Based on the survey data, Ocoee whitewater rafting generates \$6.8 million in state, local, and federal taxes.

For the Ocoee whitewater economic impacts, the total industrial output multiplier is estimated at 1.63. In other words, for every dollar spent for whitewater rafting expenditures on the Ocoee for this study area, an additional \$0.63 in economic activity is generated throughout the study region. The employment multiplier is 1.30. For every job created from whitewater rafting expenditures, an additional 0.30 jobs are created in other industries throughout the

Economic Indicators	Direct^a	Indirect^a	Induced^a	Total^a
Total Industrial Output ^b	\$26,820,460	\$7,936,032	\$9,078,075	\$43,834,568
Total Value Added ^c	\$15,940,116	\$4,594,206	\$5,519,743	\$26,054,065
Indirect Business Taxes ^d	\$2,706,419	\$319,537	\$550,123	\$3,576,079
Labor Income ^e	\$8,731,384	\$2,488,963	\$2,908,413	\$14,128,760
Employment ^f	477.1	65.0	79.9	621.9

^aSee "Expenditure effects on Economy" section for further information

^bTotal Industrial Output — annual dollar value of goods and services that an industry produces

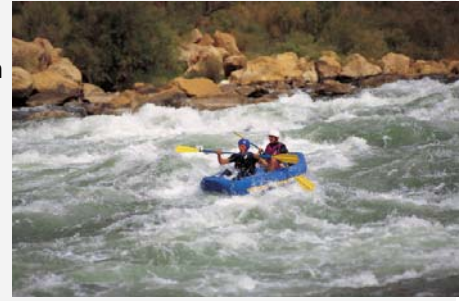
^cTotal value Added — estimated employee compensation, proprietary income, other income, and indirect business taxes

^dIndirect Business Taxes — consists of excise taxes, property taxes, fees, licenses, and sales taxes paid by businesses

^eLabor Income--consists of employee compensation and proprietor income

^fEmployment — estimated number of total wage and salary employees (both full- and part-time), as well as self-employed

region. For the whitewater rafting expenditures in the study area, the top five industries impacted for total industry output are other amusement and recreation industries; food services and drinking places; hotels and motels, including casino hotels; retail stores (gasoline stations); and retail stores (general merchandise). These same top five industries impacted for total industry output are impacted for employment too.



Discussion

It is important to note that this type of study has certain limitations. First, the results represent a single snap-shot in time. If whitewater rafters were to consistently increase their visits to an area over time, it is likely the businesses serving those users could increase. Conversely, if the visits to the area were to decrease, it is likely those businesses would decrease. Furthermore, the economic value of changes to the environment in an area, such as changes in water quality, erosion, or wildlife from use of the area's resources cannot be captured with the current analysis. Further study would be needed to capture these effects. It should be recognized that the expenditure data were derived from surveys conducted between June 8 through August 4, 2012. These data were then extrapolated to annual projections. Finally, expenditure data were taken before any alterations in management methods of the Ocoee River are made. It is assumed when using this information that the composite of expenditures presented in this year were not altered by changes in management methods.

References

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Expenditure Effects on the Economy

Expenditures by Ocoee whitewater rafters for goods and services, land, labor, capital equipment, and other materials enhance the local economy and local tax base. Economic benefits generated in a region from these activities can be measured in terms of number of jobs created and the amount of personal income accruing to residents (please see Appendix B for a more detailed study methodology description). These impact measures can be further broken down in *direct*, *indirect*, and *induced* (or *ripple*) effects.

Total economic impacts attributable to increased business activity are computed as the sum of the direct, indirect, and induced effects (for a more detailed description, please see Appendix B). *Direct* effects are those attributable specifically to the new expenditures in a region (i.e., whitewater rafters). *Indirect* effects arise from businesses' expenditures on raw materials, supplies, and other operating expenses, which help to support jobs in other local businesses. *Induced*, or ripple effects, are created as the new income generated by the direct and indirect effects is spent and re-spent within the local economy. These impacts are measured for total industry output, employment, total value added, labor income, and indirect business taxes.

Appendix A

Section 1: Economic Impact of Whitewater Rafting

The following questions will be used to determine the economic impact of whitewater rafting with a 60 mile radius of the Ocoee River (Note: Towns within the 60 mile radius from the Ocoee River include Chattanooga, Cleveland, Ducktown, Copperhill, and McCaysville)

1. **At the Ocoee River today, how many total people (including yourself) are in your party or group?**
_____ person(s).

2. **How many nights are you spending on this trip to the Ocoee River?** _____ nights.

3. **Your trip to the Ocoee River can best be described as (choose one):**

_____ a local day trip originating from within 60 miles of the Ocoee River

_____ a day trip originating from outside 60 miles from the Ocoee River

_____ an overnight trip, and I stayed within 60 miles of the Ocoee River

4. **Which of the following best describes where you stayed overnight in the local area? (within 60 miles of the Ocoee River): (choose one only if stayed overnight)**

_____ with friends or relatives (at no cost)

_____ in a hotel/motel

_____ in a cabin or house

_____ in a public or private campground

5. **Approximately how much did you spend on lodging per night?** \$ _____.

6. **Approximately how much will your total party or group spend during your entire visit (all days) to the Ocoee River area?** \$ _____ (includes rafting fees, food & beverage, grocery, shopping, gasoline, souvenirs, lodging / camping)

7. **Approximately how much will your party or group spend during your visit (all days) to the Ocoee River in the following categories;?**

Approximately \$ _____ total for rafting trip, recreation fees, parking fees and admissions

Approximately \$ _____ total for food & beverages (including restaurants, bars, grocery stores)

Approximately \$ _____ total for transportation (includes gas, oil, repairs, rentals, air)

Approximately \$ _____ total for souvenirs, T-shirts, hats, clothes, and sunscreen.

Appendix B

Methodology

Economic Impacts

To estimate the economic impacts of Ocoee whitewater rafters, expenditures from the survey data were averaged and incorporated into IMPLAN, an input-output model. Input-output models analyze the interdependence of industries in an economy through market based transactions. The model describes the transfer of money between industries and institutions and contains both market-based and non-market financial flows, such as inter-institutional transfers. Output from the model includes descriptive measures of the economy including total industry output (i.e., economic activity), value-added, indirect business taxes, and employment for 440 industries in the study region's economy. IMPLAN (Version 3.0) utilizes a National Trade Flows Model (NTFM) (doubly-constrained gravity model) to estimate a new set of regional purchase coefficients and other trade data that predict local purchases based on a region's characteristics (Lindall, Olson, and Alward, 2006). Not only can the model be used to describe a regional economy, but the model also can be used for predictive purposes, by providing estimates of multipliers. This analysis uses the local purchase percentages option available in IMPLAN modeling. As a result, this effects the impact value applied to the multipliers. Instead of a 100 percent expenditure value applied to the multiplier the model is set to the SAM value, which is normally less than that.

Multipliers measure the response of the economy to change in demand or production. Multiplier analysis generally focuses on the effects of exogenous changes on: 1) output of the sectors in the economy; 2) income earned by households because of the new outputs; and 3) employment (in physical terms) that is expected to be generated because of the new outputs. This study uses Type I and Type SAM (Social Accounting Matrix) multipliers. Type I multipliers are calculated by dividing direct plus indirect impacts by the direct impacts, where the Type SAM multipliers = (direct + indirect + induced impacts)/direct impacts. The Type SAM multipliers take into account the expenditures resulting from increased incomes of households as well as inter-institutional transfers resulting from the economic activity. Therefore, Type SAM multipliers assume that as final demand changes, incomes increase along with inter-institutional transfers. As these people and institutions increase expenditures this leads to increased demands from local industries

Description

1. Direct effects, or impacts, are those attributable specifically to the new expenditures in a region. Economic impacts result because the Ocoee whitewater rafters purchase goods and services from other industries (Direct impacts). For example, expenditures by whitewater rafters at a restaurant leads to the employment of waiters, cooks, and cashiers. These workers represent the direct employment impact of the expenditures.
2. Indirect effects, or impacts, arise from businesses' expenditures on raw materials, services, supplies, and other operating expenses, which help to support jobs in other local businesses. For example, a restaurant may have sales expand due to whitewater rafters' expenditures, thus requiring more purchases from food services wholesalers and, potentially, greater accounting and legal services from other local firms. Note that only the value added via the local production process, not the total retail sale, gives rise to additional economic benefits for the community. Only the portion of the expenditure actually retained by the local vendor can be used in the calculation of the firm's indirect income impact on the local economy. It is for this reason that retail sales, in isolation, represent a poor measure of economic impact. Hence, when local businesses purchase merchandise for resale, most of the proceeds accrue to the community where the goods were manufactured. Thus, the size of a firm's indirect impact on local incomes depends primarily on the dollar value of locally purchased goods and services and whether or not these same goods and services are locally produced or imported into the community. In addition, the amount of

indirect employment generated by the business firm will vary with the amount of under-utilization of workers and capacity existing in local businesses. Although the firm's payments to local vendors increases the amount of local business activity, they will not translate to significant increases in employment if local firms are currently experiencing excess capacity. The model assumes that firms are operating at full capacity, so estimates of indirect effects may overstate economic impacts if firms were actually operating at less than full capacity. "Full" capacity, in this sense, can be thought of as a "traditional" operating level, generally 70-80% of true plant capacity, thus allowing firms to expand operations in the short-run.

3. Induced impacts, or ripple effects, are created as the new income generated by the direct and indirect effects is spent and re-spent within the local economy. For example, part of the wages received by a firm's employees will be spent on housing. When a restaurant employee rents an apartment in Tennessee or Georgia, a portion of the rent payment will be used to pay local employees of the apartment complex. These employees will in turn spend a portion of their income in the local community on groceries, housing, etc., thus adding to the amount of local personal income attributable to the firm's activities. However, during each of these subsequent rounds of spending, a large portion of the income generated leaks out of the state economy through taxes, savings, and spending outside the state or region, thereby diminishing the increment to state's or region's income attributable to these firms.