Agri-Industry Modeling and Analysis Group

Industry Brief

Burton C. English, R. Jamey Menard, and Kim L. Jensen
Department of Agricultural Economics, The University of Tennessee

Estimated Economic Impacts of Tennessee's State Parks

Background

Tennessee has approximately 53 State Parks encompassing over 144,000 acres across the state. Tennessee State Parks offer natural amenities, historic sites and rustic to resort-type facilities. There are six resort parks with inns and restaurants, 36 campgrounds, seven marinas, 12 golf courses and five other parks with restaurants (Tennessee Department of Environment and Conservation, 2009). The most poplar recreational activities, according to a 2008 survey of state park visitors, are viewing natural features (88 percent), walking (76 percent) and driving for pleasure, viewing wildlife other than birds (65 percent), picnicking (59 percent), playing in a creek or stream (48 percent), bird watching (42 percent), and day hiking (41 percent).

Figure 1. Locations of Tennessee's State Parks.

Every five years the Tennessee Department of Environment and Conservation (TDEC) prepares a State Comprehensive Outdoor Recreation Plan (SCORP) to gauge public sentiment, needs, and demand to guide outdoor recreation priorities in Tennessee for the next 5-10 years. As part of this planning effort, a phone survey was conducted to assess use of and attitudes toward Tennessee State Parks and to estimate most recent trip expenditures of the 564 respondents who said they visited a State Park in 2008-2009 (see Appendix A for trip expenditure questions used in the survey). Expenditures on recreational activities from Tennessee's State Parks impacts the state's economy. These expenditure figures were then used to estimate

Expenditures Effects on Economy

Expenditures by State Parks and/or visitors for goods and services, land, labor, and other materials enhances both the local and state economies and tax base. Economic benefits garnered by an economic region from the activities can be measured in terms of the number of jobs created and the amount of personal income accruing to residents. These impacts can be further broken down into *direct*, *indirect*, and *induced (or ripple)* effects.

Total economic impacts attributable to increased economic 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 attributed specifically to the new expenditures in a region (i.e., State Parks and/or visitors' expenditures). *Indirect* effects arise from 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 (a measure of economic activity), employment, total value added, and indirect business taxes.

the total economic impacts of Tennessee State Parks. The phone survey was conducted from July 2 through August 6, 2009, by the Human Dimensions Research Lab in the Department of Forestry, Wildlife, and Fisheries at The University of Tennessee using random digit dialing to randomly select a sample of 1,137 Tennessee residents 18 years of age and older. In addition, economic impacts were estimated for operating the 53 State Parks. This AIMAG industry brief analyzes these economic impacts using IMPLAN, an input-output model.

Economic Impacts of State Park Visitors

Survey questions were posed to park visitors from Tennessee concerning State Parks, outdoor recreation access, policies and funding, and constraints on outdoor recreation participation. Of the six main expenditure categories used in the survey (Table 1), food and beverages had the largest mean expenditure per trip at $56.79, followed by transportation ($22.61 per trip), other expenditures ($22.45 per trip), lodging ($17.36 per trip), fishing expenditures ($3.96 per trip), boating expenses ($3.65 per trip), and golfing expenditures (1.82 per trip). More specifically, for the food and beverages category, food/drinks purchased at a grocery store was the largest expense category. For transportation, fuel/oil expenditures was the largest. For other expenditures, camping equipment/supplies and souvenirs/ gifts were the two largest expenditure categories. For lodging, overnight stays at the State Park's inn or lodge was the largest followed by overnight stays at the park's campground. Overall, the average mean expenditures per trip was $128.64.

Table 1. Average Expenditure Per Trip of Tennessee State Park Visitors

Category	Average
Food & Beverages	**$56.79**
Transportation	**$22.61**
Other Expenditures	**$22.45**
Lodging	**$17.36**
Fishing	**$3.96**
Boating	**$3.65**
Golfing	**$1.82**
Overall Average	***$128.64***

In order to calculate the estimated economic impacts, an estimate of the annual visitors to Tennessee's State Parks is required. Based on vehicle trip counter information used in the parks for 2008, 8.8 million vehicles entered the State Parks. In order to account for some vehicles making repeated trips entering and exiting the park, vendor and service vehicles, and employees who work in the park, an adjustment factor was required to account for this type of activity. Based on a study of Texas State Parks (Kaczynski and Crompton, 2003), the percentage of vehicles attributed to visitors, accounting for official vehicles or visitors re-entering the parks, ranged from 28 percent to 99 percent with an average of 76 percent. For this analysis the more conservative midpoint value of 63.5 percent was used. Using this adjustment factor, the number of individuals used to estimate the economic impacts was 5,637,623 (8,878,146 x 0.635). For 2008/2009, an estimated 16.9 million individuals visited Tennessee's State Parks (5,637,623 x 3 people per car). From the telephone survey, the average mean expenditures per trip was $128.64. As a result, the direct economic impact from the 2009 Tennessee Recreation Survey was $725.2 million (2009 $).

For the estimated level of direct State Park visitor related expenditures of $725.2 million, close to 12,000 jobs were financed (Table 2) (see Appendix B for a more detailed discussion on IMPLAN). Total value added and indirect business taxes direct expenditures were estimated at close to $441.0 million and $68.0 million respectively. Total impacts for the state's economy were estimated at $1.5 billion in total industry output from State Park visitors' expenditures. Estimated total number of jobs was over 18,600, with total value added estimated at close to $909.1 million. Indirect business taxes from State Park visitors were estimated at $106.3 million.

For the economic indicator total industrial output, the estimated multiplier is 2.11. In other words, for every dollar State Park visitors spent on trip

Table 2. Estimated Economic Impacts from Tennessee State Parks Visitors on the State's Economy					
Economic Indicators	**Units**	**Direct[a]**	**Indirect[a]**	**Induced[a]**	**Total[a]**
Total Industrial Output[b]	**Million $**	**$725.2**	**$230.2**	**$575.5**	**$1,530.9**
Total Value Added[c]	**Million $**	**$441.0**	**$126.0**	**$342.1**	**$909.1**
Indirect Business Taxes[d]	**Million $**	**$68.0**	**$10.6**	**$27.7**	**$106.3**
Employment[e]	**Number**	**11,812**	**1,747**	**5,119**	**18,678**

[a]See page 1, "Expenditures Effects on Economy" section for further information or Appendix B for a more detailed discussion.
[b]Total Industrial Output — annual dollar value of goods and services that an industry produces.
[c]Total Value Added — estimated employee compensation, proprietary income, other income, and indirect business taxes.
[d]Indirect Business Taxes — consists of excise taxes, property taxes, fees, licenses, and sales taxes paid by businesses.
[e]Employment — estimated number of total wage and salary employees (both full– and part-time), as well as self-employed.

related expenditures, an additional $1.11 of economic activity is generated throughout the state. Likewise, the employment multiplier is estimated at 1.58. For every job created based on expenditures from State Park visitors, an additional 0.58 jobs are created in other industries throughout the state.

For indirect impacts, the top five industries impacted were real estate, management of companies and enterprises, wholesale trade, banking, and telecommunications. Likewise, for induced impacts, owner-occupied dwellings, wholesale trade, state and local education, real estate, and health care professionals (physicians, dentists, etc.) were the top five industries impacted.

Economic Impacts of State Park Expenditures

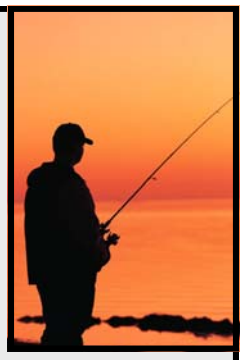
Economic impacts also occur when expenditures are used for operations and maintenance of Tennessee State Parks. Employees of State Parks also purchase goods and services in the surrounding area. Annual economic impacts from the State Parks will include expenditures for leasing vehicles and buildings; utilities; communication; office equipment; fuel, oil, and maintenance/repair for vehicles; plus items purchased by the State Parks to re-sale to visitors (for example, restaurant, gift shop, golf, and camping items).

The estimated economic impacts from Tennessee's State Parks' expenditures for 2008/2009 are shown in Table 3. The estimated level of direct park related expenditures was $77.8 million, which financed over 570 jobs. Total value added and indirect business taxes were estimated at $37.6 million and $3.2 million respectively. Total impacts to the state's economy from State Park expenditures were estimated at $134.3 million

Table 3. Estimated Economic Impacts of Tennessee State Parks Expenditures on the State's Economy					
Economic Indicators	**Units**	**Direct[a]**	**Indirect[a]**	**Induced[a]**	**Total[a]**
Total Industrial Output[b]	**Million $**	**$77.8**	**$14.3**	**$42.2**	**$134.3**
Total Value Added[c]	**Million $**	**$37.6**	**$7.7**	**$24.7**	**$70.0**
Indirect Business Taxes[d]	**Million $**	**$3.2**	**$0.6**	**$2.0**	**$5.8**
Employment[e]	**Number**	**572**	**112**	**367**	**1,051**

[a]See page 1, "Expenditures Effects on Economy" section for further information or Appendix B for a more detailed discussion
[b]Total Industrial Output — annual dollar value of goods and services that an industry produces
[c]Total Value Added — estimated employee compensation, proprietary income, other income, and indirect business taxes
[d]Indirect Business Taxes — consists of excise taxes, property taxes, fees, licenses, and sales taxes paid by businesses
[e]Employment — estimated number of total wage and salary employees (both full– and part-time), as well as self-employed

in total industry output. Estimated total number of jobs was over 1,000, with total value added estimated at over $70.0 million. Indirect business taxes from State Park expenditures were estimated at $5.8 million.



For the economic indicator, total industry output, the estimated multiplier is 1.72. Hence, for every dollar State Parks spent on park related expenditures, an additional $0.72 is generated throughout the state. Likewise, the employment multiplier is estimated at 1.84. For every job created based on expenditures by the State Parks, an additional 0.84 jobs are created in other industries throughout the region.

For indirect impacts, the top five industries impacted were real estate, wholesale trade, management of companies and enterprises, telecommunications, and banking. Likewise, owner-occupied dwellings, wholesale trade, real estate, health care professionals (physicians, dentists, etc.), and hospitals were the top five industries impacted for induced impacts.

Discussion

This analysis projected state level economic impacts by Tennessee State Park visitors is $725.2 million. From annual operating expenditures by State Parks, the estimated economic impact was $77.8 million. When considering the multiplier effects of these expenditures on the state's economy, the combined economic impacts from the park visitors and State Park expenditures is $1.6 billion.

It is important to note that a study of this type has certain limitations. Due to budget and time constraints, the survey was conducted for Tennessee residents only. As a result, the expenditures by state park visitors from other states was assumed to be the same for in-state residents. In all likelihood, however, we would expect expenditures by out-of-state visitors to be greater. Another factor to consider is that economic impacts alone are not the only way to measure the benefits of State Parks. State Parks enhance the social, psychological, and physical well-being of Tennessee residents and preserve natural, historic, cultural, and recreational resources for future generations.

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AIM-AG|AGRI-Industry Modeling & Analysis Group: (Dr. Burton English, Dr. Kim Jensen, and Mr. Jamey Menard), Department of Agricultural Economics, University of Tennessee Institute of Agriculture. For more information concerning *AIM-AG*, please contact the group at 865/974-7231 or visit the web site at http://web.utk.edu/~aimag/. Data generated for this report from IMPLAN pro, Minnesota IMPLAN Group, 2006. Surveys conducted by the Human Dimensions Research Lab: (Dr. Mark Fly, Becky Stephens, April Griffin, Susan Schexnayder, and Katie Percy), Department of Forestry, Wildlife, and Fisheries, The University of Tennessee Institute of Agriculture.

Appendix A
Tennessee Recreation Plan Survey 2009
State Park — Economics

In order to learn about the economic impact of State Parks in Tennessee, we would like to ask you specific questions about your last trip.

1. On your most recent trip to (name of State Park), did your trip originate from the city in which you live?
   1 Yes [SKIP TO 2]
   0 No

   IF NO 1a What city did your trip originate from? _____

2. Including yourself, how many people were in your travel party to visit this Tennessee State Park? Please include all family and non-family members [IF single person, SKIP TO 4]

3. Did you pay expenses for yourself or any of the people traveling in your party?
   1 Yes
   0 No

   IF YES 3a How many people did you pay for including yourself?

4. Was this most recent trip to (name of state park) a day trip or did you stay overnight?
   1 Day trip [SKIP TO 6a]
   2 Overnight

   4a. If overnight, how many nights did you spend away from home on your trip to (state park)?

5. Did you stay?:
   1 Overnight at (name of state park) [SKIP TO 5a]
   2 At a home with family or friends where no lodging charges were incurred [SKIP TO 6a]
   3 Or elsewhere near the park?
   4 Both at the park and near the park [SKIP TO 5a]
   8 Don't know
   9 Refused

   5a For your overnight lodging at the park, how much was spent on:
   Campground fees at the state park $_____
   Overnight lodging such as an inn or lodge at the park $_____

   5c For your overnight lodging outside the park, how much was spent on:
   Campground fees outside the state park $_____
   Overnight lodging such as hotel or motel $_____

Appendix A (cont.)

6. For transportation to, from, and around the park, how much did you spend on:
   $_____ Fuel & oil for your vehicle?
   $_____ Repairs/service for your vehicle?
   $_____ Rental fees for your vehicle
   $_____ Packaged bus tour?

7. How much did you spend on:
   $_____ Food/drinks purchased at a convenience store
   $_____ Food/drinks purchased at a grocery store
   $_____ Food/drinks at restaurants

8. Did you bring or rent a boat, jet-ski, or wave-runner on this trip?
   1 Yes
   0 No [SKIP TO 9]

   If yes, how much was spent on:
   $_____ Fuel & oil for your water-craft?
   $_____ Repairs/maintenance
   $_____ Launch/slip/or marina fees?
   $_____ Boat, jet-ski, or wave runner rental?

9. Did you have fishing related expenditures?
   1 Yes
   0 No [SKIP TO 10]

   If yes, how much was spent on:
   $_____ Fishing fees/licenses
   $_____ Fishing supplies/bait
   $_____ Guide/outfitter fees
   $_____ Equipment rental

10. Did you play golf on this trip?
    1 Yes
    0 No [SKIP TO 11]

    If yes, how much was spent on golfing related activities such as green fees, club and cart rentals?
    $_____

11. Did you have any other expenditures on this trip such as:

    $_____ Rental equipment such as bicycles, horseback riding, whitewater rafting, or other activities
    $_____ Admissions to museums, theaters, conferences, festivals, or other attractions
    $_____ Clothing/footwear
    $_____ Souvenirs & gifts
    $_____ Camping equipment/supplies

Appendix B
Methodology/Description

To estimate the economic impacts of State Parks, operating expenditures from the State Parks and visitors' expenditures were 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 over 500 industries in the study region's economy (state of Tennessee). The model uses regional purchase coefficients generated by econometric equations that predict local purchases based on a region's characteristics. 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.

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 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.

Direct effects, or impacts, are those attributable specifically to the new expenditure region. Economic impacts result because Tennessee State Parks or Park visitors purchase goods or services from other industries (Direct impacts). For example, expenditures by State Park visitors at a restaurant leads to the employment of waiters, cooks, and cashiers. These workers represent the direct employment impact of the expenditures.

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 State Park visitors' 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 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

Appendix B (cont.)

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 percent of true plant capacity, thus allowing firms to expand operations in the short-run.)

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, 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.