

Executive Summary of the Economic Contributions and Ecosystem Services of Springs in the Lower Suwannee and Santa Fe River Basins of North-Central Florida¹

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Executive Summary

This study examined the economic contributions, consumer surplus, and ecosystem services provided by recreational use of fifteen major springs sites in north central Florida. Specifically, we focused on springs at six state parks (Fanning, Ichetucknee, Lafayette Blue, Manatee, Troy, and Wes Skiles Peacock), four county parks (Hart, Little River, Poe, and Rum Island), and five privately owned sites (Blue Grotto, Blue Springs (Gilchrist County), Devil's Den, Ginnie Springs, and Hornsby Springs). These springs are located in a nine-county study area, including: Alachua, Bradford, Columbia, Dixie, Gilchrist, Lafayette, Levy, Suwannee, and Union Counties in Florida (Figure 1).

Information on visitation of publicly owned springs for the period 2000–2012 was obtained from published reports by the Florida Park Service. Expenditures by springs users were estimated based on entry fees and average visitor spending for transportation, food and lodging from the *2011 Annual Visitor Study* (Visit Florida). Interviews were conducted with owners and managers of local businesses serving springs visitors, local government leaders, park managers, and researchers to verify the annual visitation and spending estimates. Published academic studies and other economic reports on Florida springs were also reviewed.



Analysis of the economic contributions of springs-related recreational spending was accomplished using a regional economic model constructed with the *IMPLAN* software and associated databases for Florida counties (IMPLAN Group, LLC). Regional economic input-output models describe the structure of a local economy in terms of the flow of goods and services between industry firms, household consumers and governments (Miller and Blair 2007; Mulkey and Hodges 2012). The economic model enables

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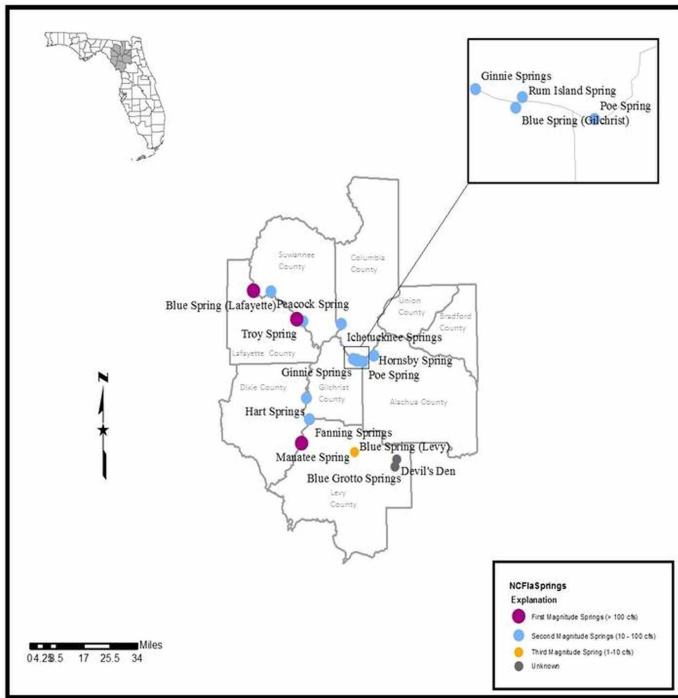


Figure 1. Map of nine-county study area and locations of major springs studied in north central Florida [Credit: J. Hatchitt, Alachua County Environmental Protection Department]

estimation of regional multiplier effects arising due to supply chain activities and household income re-spending, in addition to direct spending for springs recreation.

Total recreational use at the selected spring sites averaged slightly over one million visitor days annually during the 2008–2013 period, with attendance exceeding 100,000 visitor-days at Manatee Springs State Park, Fanning Springs State Park, Ichetucknee Springs State Park, and Ginnie Springs. Diving is a special highly-valued recreational use of the springs (Figure 2), and use of the springs by divers was estimated at around 57,000 visitor-days annually, including over 10,000 visitor-days at Peacock Springs, Ginnie Springs, and Blue Grotto. There was no discernable trend over time in springs visitation, however, significant seasonal and year-to-year variations were attributed to weather and economic conditions. The share of nonlocal visitors to the springs from outside the nine-county study area was reported at about 70 percent for most sites.

The estimated annual economic contributions of springs-related recreational spending in north-central Florida for FY 2012/13 are summarized in Table 1 for each spring studied. The main results for all springs studied are as follows:



Figure 2. Cave diver in Peacock Springs [Credit: M. Long, Chiefland, FL]

- \$84.2 million in total visitor spending for springs recreation
- \$45.3 million in spending by non-local visitors
- 1,160 full-time and part-time jobs generated
- \$30.42 million in labor income
- \$94.00 million in industry output (gross sales revenues)
- \$52.58 million in value added, equivalent to Gross Domestic Product (GDP)
- \$6.56 million in local/state government tax revenues, including property taxes of \$4.13 million and sales taxes of \$1.58 million
- \$6.57 million in federal government tax revenues

The consumer surplus for springs recreational users was estimated based on previous studies that surveyed springs users about their willingness to pay for recreation in excess of their actual expenses. For typical recreational uses at springs with moderately improved facilities, the willingness to pay was \$11.42 per trip for day visitors, and \$16.90 per trip for extended visitors, in 2013 dollars (Shrestha et al. 2002). For cave divers at Blue Spring in Jackson County, Florida, the willingness to pay averaged \$166 per person, per trip (Morgan and Huth 2011). We applied these consumer surplus estimates to the study area together with information on average length of stay and estimated the total consumer surplus for the fifteen spring sites in the study area at \$9.44 million annually (Table 1).

In addition to recreational uses examined in this study, springs and their related hydrologic systems provide a variety of ecosystem services to society, including provisioning services such as bottled drinking water, supporting

services such as nutrient cycling, regulating services such as flood control, and cultural services such as personal inspiration, art, scientific knowledge, environmental education, existence value for endangered species, etc. The value of these ecosystem services was not quantified.

The results of this study should be recognized in relation to its methodological limitations. Visitation data for private springs sites was limited; visitor-spending data were taken from secondary sources rather than directly from visitors; consumer surplus estimates were derived from studies for other Florida regions; only recreational uses were considered (recreation is only one of many ecosystem services springs provide). We suggest that further research should involve primary data collection through visitor surveys, the use of more advanced econometric methods, and a more comprehensive assessment of the many ecosystem services that springs provide.

Further details about this research are available in the complete study report at <http://www.fred.ifas.ufl.edu/pdf/economic-impact-analysis/FE958.pdf>

References

IMPLAN Group, LLC. 2004. *IMPLAN* software for impact analysis and social accounting (version 3.0) and Florida county data for 2011, Huntersville, NC, available at <http://www.implan.com>

Miller, R. E. and P. D. Blair. 2009. *Input-Output Analysis: Foundations and Extensions*, Second Edition. Cambridge, UK: Cambridge University Press.

Mulkey, D. and A. W. Hodges. 2012. *Using IMPLAN to assess local economic impacts*. #FE168. UF/IFAS Extension. Gainesville, FL. <http://edis.ifas.ufl.edu/fe168>

Morgan, A. O. and W. L. Huth. 2011. "Using revealed and stated preference data to estimate the scope and access benefits associated with cave diving." *Resource and Energy Economics* 33:107–118.

Shrestha, R. L., J. R. R. Alavalapati, T. V. Stein, D. R. Carter, and C. B. Denny. 2002. "Visitor preferences and values for water-based recreation: A case study of the Ocala National Forest." *Journal of Agricultural and Applied Economics* 34(3):547–559.

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Table 1. Summary of annual visitation, spending, economic contributions, and consumer surplus for springs in the Lower Suwannee and Santa Fe River basins of north central Florida, FY 2012/13

Ownership	Springs name (county)	Average annual visitor-days	Total spending (M\$)	Spending nonlocal visitors (M\$)	Regional Economic Contributions*				Consumer surplus (M\$)
					Employment (jobs)	Labor income (M\$)	Value added (M\$)	Industry output (M\$)	
State or county	Manatee	142,641	\$10.63	\$7.44	139	\$3.97	\$6.78	\$12.26	\$1.11
	Fanning	293,303	\$21.03	\$2.10	180	\$4.49	\$7.70	\$14.95	\$3.18
	Ichetucknee	177,543	\$13.10	\$9.17	169	\$4.86	\$8.29	\$15.02	\$1.31
	Blue (Lafayette)	33,684	\$2.42	\$1.69	30	\$0.88	\$1.50	\$2.72	\$0.25
	Peacock	13,887	\$2.83	\$1.98	63	\$1.51	\$2.66	\$4.49	\$0.39
	Troy	11,293	\$2.12	\$1.49	46	\$1.11	\$1.97	\$3.33	\$0.29
	Little River	11,025	\$1.47	\$1.03	29	\$0.71	\$1.25	\$2.14	\$0.19
	Hart	35,000	\$2.54	\$1.02	27	\$0.74	\$1.26	\$2.35	\$0.32
	Poe	5,730	\$0.39	\$0.16	4	\$0.11	\$0.19	\$0.34	\$0.05
	Rum Island	9,800	\$0.66	\$0.03	6	\$0.13	\$0.22	\$0.43	\$0.11
Private	Ginnie	190,000	\$17.31	\$12.12	285	\$7.31	\$12.73	\$22.17	\$1.43
	Blue (Gilchrist)	41,000	\$3.19	\$2.23	46	\$1.24	\$2.13	\$3.77	\$0.22
	Hornsby	20,000	\$1.55	\$0.78	20	\$0.52	\$0.90	\$1.61	\$0.10
	Blue Grotto	13,000	\$3.42	\$3.07	88	\$2.15	\$3.79	\$6.31	\$0.42
	Devil's Den	5,000	\$0.74	\$0.55	16	\$0.38	\$0.67	\$1.14	\$0.07
Santa Fe River canoeing**	9,160	\$0.81	\$0.48	12	\$0.31	\$0.54	\$0.95		
Total all springs		1,012,066	\$84.19	\$45.34	1,160	\$30.42	\$52.58	\$94.00	\$9.44

Values in millions of 2014 dollars. Employment represents full-time and part-time jobs.
 *Regional economic contributions include regional multiplier effects for nonlocal visitor spending.
 **Activity for several canoeing outfitters that feature visits to spring sites along the Santa Fe River