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Economic Impact of Hunting Expenditures on Southern U.S

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Economic Impact of Hunting Expenditures on Southern U.S

Abstract:

Hunting, fishing and wildlife-associated recreation expenditures have played an important role in the U.S economy and help promote conservation and environmental goals. The 2006 U.S Fish and Wildlife Service (USFWS) survey reported 87.5 million people aged 16 and above participated in wildlife-associated recreation activities, spending \$122.4 billion on trips and equipment. This spending is a 13 percent increase since 2001. The recently released 2011 National Survey of Fishing, Hunting and Wildlife-Associated Recreation reports \$145 billion in expenditures on trips and equipment, which is an 18.5 percentage increase since 2006. Periodic assessment of economic impacts associated with wildlife recreation expenditures provides a consistent perspective on forest and wildlife resource management. This research quantified economic impacts of wildlife-associated recreation expenditures for the thirteen states in the U.S South by calculating total gross output, employment, employee compensation, proprietor income, other property income, and indirect business taxes. IMPLAN models were developed for each state using the 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation data to determine the indirect and induced effects of these expenditures. Data for 2006 was used since the 2011 state level data was not yet available.

The analysis computed economic impacts at broad activity levels: fishing, hunting, and wildlife watching and at sub-activity levels: fresh and salt water fishing, and big game, small game, migratory bird and other small game hunting. This approach enabled

comparison of the relative importance of wildlife-associated recreation to the various southern states. In particular, the comparison revealed how differences in the individual states' economies and levels of expenditures affect the total economic impacts of wildlife-associated activities. Differences in the impacts of various recreational activities, both among activities and among states, illustrates the importance of understanding intra-regional variations in establishing wildlife programs and policies.

Preliminary results indicate that the \$8.4 billion spent in 2006 by recreationists for hunting in the U.S South generated direct impacts of \$5.9 billion in output and 74,012 in employment. These impacts resulted in indirect impacts of \$2.8 billion in output and 17,965 in employment and induced impacts of \$5.9 billion in output and 51,451 in employment. The total impact due to hunting expenditures was \$14.8 billion in output and 143,429 in employment. Hunting-related expenditures generated additional employee compensation of \$4.3 billion, other property income of \$2.5 billion, proprietor income of \$624 million, and indirect business taxes of \$942 million. Hunting expenditure impacts indicate a type SAM output multiplier of 2.48. This means that each dollar of direct output generated by hunter expenditures generates an additional \$1.48 of output. Similarly, type SAM multipliers for employment, employee compensation, proprietor income, property income, and indirect business taxes were estimated to be 1.94, 2.27, 2.57, 3.34, and 2.05, respectively. Fishing and wildlife watching has also generated significant impacts on regional economies and complete estimates of these impacts are forth coming.

Keywords: Wildlife recreation, Hunting expenditures, IMPLAN, Economic Impact

Economic Impact of Hunting Expenditures on Southern U.S

Introduction

Hunting, fishing, and wildlife-related recreation expenditures play an important role in the U.S. economy and promote conservation and environmental goals. In 2006, nearly 87.5 million people in the United States spent over \$122.3 billion for wildlife-related recreation activities, which equated to 1 percent of the Gross Domestic Product (U.S. Department of the Interior (USDOI) 2006). This spending is a 13 percent increase since 2001. The recently released 2011 National Survey of Fishing, Hunting and Wildlife-Associated Recreation reports \$145 billion in expenditures on trips and equipment, which is a 18.5 percentage increase since 2006 (USDOI, 2011). Depending on a region's economic and natural resource base, wildlife-associated recreation expenses can be significant (Ingram and Lewandrowski, 1999). These expenditures can have a significant direct impact on an economy. However, there are other indirect and induced expenses that arise from the expenditures of wildlife recreation-related goods and services. Little research has been done on the economic impact of hunting and other wildlife recreation expenditures in different states (Steinback, 1999; Grado et al., 2001; Pickton and Sikorowski, 2004; Hussain et al., 2008; Grado et al., 2011). However, evaluations of the importance of wildlife-associated recreation have typically focused on the individual county, state, or sub-regional level. Munn et al. (2010) estimated the economic contributions of wildlife-related recreational activities to the South's regional economy and established a baseline for future regional comparisons. Hussain et al. (2012) used a general equilibrium model to evaluate the impact of hunting expenditures

on the South's regional economy and found that wildlife-associated recreation expenditures have significant impact on employment and value added. Though some literature evaluating recreational expenditures at the regional level exists, research comparing the economic impacts of wildlife-associated recreation expenditures across states is lacking. This gap is important because the variation between states can be substantial, particularly when indirect and induced effects are considered. Hence, periodic assessment of economic impacts associated with hunting expenditures provides a consistent perspective on forest and wildlife resource management. In particular, the comparison reveals how differences in the individual states' economies and levels of expenditures affect the total economic impacts of wildlife-related activities. Differences in the impacts of hunting activities, both between activities and between states, illustrate the importance of understanding intra-regional variations in establishing wildlife programs and policies.

Input-output analysis is commonly used to document the economic contributions of the wildlife-related recreation expenditures. It is increasingly being utilized to estimate the contributions of wildlife-related activities to local economies (Upneja et al., 2001; Southwick, 2008; Goldman et al., 1998; Hussain et al., 2008; Munn et al., 2010). The program most commonly used for input-output analysis is the U.S. Forest Service's IMPLAN (IMPact analysis for PLANning) system. IMPLAN databases are available on national, state, county, and zip code levels and include employment, earnings, total output, value-added, tax impacts, and economic multipliers.

This paper focused on the hunting expenditures of the southeast U.S region for several reasons; land in southern U.S is largely privately owned; hunting lease markets are more developed, and many of the game species and wildlife viewing opportunities are unique to this region (Hussain et al., 2012). These features likely induce different expenditure patterns and consequently different regional economic impacts. Given that wildlife and forest management are closely interlinked, it is appropriate that economic impacts associated with wildlife recreation expenditures are analyzed at the same geographic scale to provide a consistent perspective on the region's forestry and wildlife resource management. This paper compares the economic contributions of hunting expenditures between the southern states using the 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation data and 2009 IMPLAN data. This paper establishes similar baseline results as are available for the forest-products industry, and pending research will update these estimates when the 2011 wildlife expenditures data become available.

Methods

To identify the economic contributions of hunting expenditures, IMPLAN models were constructed for each southern state using 2009 IMPLAN data and 2006 National Survey of Fishing, Hunting and Wildlife- Associated Recreation data to determine the indirect and induced effects of these expenditures. To be compatible with the 2009 IMPLAN database, 2006 expenditure dollars were inflated to 2009 dollars, and after simulation, results were deflated to 2006 dollars for reporting purposes using IMPLAN-provided deflators. IMPLAN was used to

conduct input-output analysis. This analysis is commonly used to identify the impacts because it models the linkages among industries and quantifies the net economic impact by adjusting for leakages induced by regional trade, taxes and savings (Leontief, 1986). Consistent with the methodology used by Munn et al. (2010) to compute regional contributions of wildlife-related expenditures, the economic contributions of hunting expenditures were computed for each of the 13 southern states¹. The results of the regional analysis by Munn et al. (2010) and the results from this study serve as the benchmark for future comparisons. The National Survey of Fishing, Hunting, and Wildlife-Associated Recreation is conducted on a five-year cycle with the most recent survey conducted in 2011; however, a full survey report that will include state level data is not yet published. Particular attention was given to relative shifts in magnitude of economic impacts for hunting expenditures as compared with the total state or regional economies to determine the extent to which the hunting expenditures are having an increasing or decreasing impact on the base economy.

Results

Economic impacts associated with hunting expenditures to southern states regional economies are reported in table 1. Important economic indicators include total output, employment (number of jobs, full- or part-time), employee compensation, proprietor income, other property type income and indirect business taxes. Overall, hunters spent US \$8.4 billion on goods and services in U.S South.

¹ Munn et al. (2010) prorated different expenditure sectors based on the national ratio, whereas this study used all the data available in survey report and only prorated data which were not reported.

This spending generated direct impacts of \$5.9 billion in output and 74,012 in employment. These impacts resulted in indirect impacts of \$2.8 billion in output and 17,965 in employment and induced impacts of \$5.9 billion in output and 51,451 in employment. The total impact due to hunting expenditures was \$14.8 billion in output and 143,429 in employment, implying a SAM multiplier of 2.48 for total output and 1.94 for total employment. This means that each dollar of direct output generated by hunter expenditures generates an additional \$1.48 of output and each additional job generated by initial spending creates more jobs. For each job due to direct expenditures, another 0.94 jobs are created as a result of indirect and induced impacts. Hunting-related expenditures generated additional employee compensation of \$4.3 billion, other property income of \$2.5 billion, proprietor income of \$624 million, and indirect business taxes of \$942 million. Similarly, type SAM multipliers for employee compensation, proprietor income, other property income, and indirect business taxes were estimated to be 2.27, 2.57, 3.34, and 2.05 respectively (Table 1).

At the state level, there was considerable variation in economic indicators.

Economic impacts associated with hunting expenditures among southern states are reported in table 2. Total gross output due to hunting expenditures in the southern region was US\$11,814 million. Of this output, Texas was responsible for the largest share at \$3,591 million with a SAM multiplier of 2.39, whereas South Carolina's share of the regional gross output was the smallest at \$371 million, with a SAM multiplier of 1.87. In the region, employment resulting from hunting expenditures totaled 98,715 jobs. As with gross output, Texas accounted for the largest share

with 28,133 jobs compared to South Carolina, which accounted for 3,372 jobs. For all other economic indicators such as employee compensation, proprietor income, other property income and indirect business taxes, Texas accounted for the largest share compared to other states in the region (Table 2).

Discussion

Hunting and other wildlife recreation activities have an important role in natural resource management. Understanding the contribution of hunting expenditures to regional and state economies is important because it contributes to rural development. This study estimated the economic impact of hunting expenditures to southern states regional economy and to individual state economies using input-output techniques with IMPLAN software and data. The US\$8.4 billion spent in 2006 by hunters on hunting resulted in US\$5.9 million direct output, which in turn generated US\$14.8 billion in total gross output in the regional economy, with a SAM multiplier 2.48. This value is greater than other forest-based industries estimated by (Tilley, 2007) in the southeast US, such as lumber and wood products (1.82), wood furniture (1.78) and paper and allied products (1.57). This indicates that hunting-related output has greater economic impacts than outputs of equal size by other forest-based industries and suggests that efforts to stimulate rural economies should consider wildlife recreation as a first option. The SAM multipliers for other key economic indicators of the regional economy vary substantially. Other property type income has the largest SAM multiplier at 3.34 while employment has the smallest SAM multiplier at 1.94. These multipliers indicate that profits, payments for rent, royalties and interest income generated by from hunting

sector expenditures have substantial impacts on other sectors of the economy. Also, each job due to direct expenditures generates another 0.94 jobs. At the state level, the economic contribution of hunting expenditures vary greatly. The two states with the largest hunting-related economic impacts as measured by hunting-related employment are Texas and Arkansas, whereas two smallest economies by total employment are South Carolina and Kentucky. Texas held this distinction for the other economic indicators as well. There is some variation in economic indicators between other states (Table 2).

The economic impacts due to hunting expenditures estimated in this study provide valuable information to wildlife recreation managers, rural economic developers and policy makers. This information can be used to investigate potential economic impacts of any new investment in the hunting sector and other wildlife recreation activities. Periodic assessments of economic impacts of hunting expenditures provide a consistent perspective and up-to date information for wildlife resource managers.

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Recreation.

Table 1: Economic impact of hunting expenditures on the southern United States regional economy from the 2009 IMPLAN database.

Impact Type	Total output	Employment ¹	Employee Compensation	Proprietor Income	Other property type income	Indirect Business taxes
Direct Effect	5,963	74,012	1,899	243	752	460
Indirect Effect	2,842	17,966	738	131	522	124
Induced Effect	5,996	51,451	1,677	250	1,239	358
Total Effect	14,800	143,429	4,314	624	2,514	942
Type-I Multiplier	1.48	1.24	1.39	1.54	1.69	1.27
Type-SAM	2.48	1.94	2.27	2.57	3.34	2.05

Table 2: Economic impact of hunting expenditures between the southern United States from the 2009 IMPLAN database.

States	Total output	Employment ¹	Employee compensation	Proprietor income	Other property income	Indirect business taxes
Alabama	874	7844	220	27	149	40
Arkansas	922	8813	232	28	143	42
Florida	585	4643	154	17	111	30
Georgia	950	8485	264	33	173	47
Kentucky	526	4656	134	17	95	25
Louisiana	698	6129	173	22	112	31
Mississippi	586	5934	153	19	97	28
N. Carolina	632	4728	164	15	100	27
Oklahoma	631	4928	147	23	106	25
S. Carolina	371	3372	98	9	70	18
Tennessee	761	5637	178	27	104	28
Texas	3,591	28133	894	169	696	179
Virginia	687	5413	180	14	121	30
Total South	11,814	98715	2,990	421	2,079	550

¹ (Full-and part-time jobs)

Amounts reported in 2006 dollar value (Millions of \$)