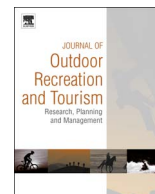




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Research Note

Economic contributions of wildlife watching recreation expenditures (2006 & 2011) across the U.S. south: An input-output analysis

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ABSTRACT

Non-consumptive wildlife recreation is a popular activity for many people and its importance to the U.S. economy is gradually expanding. In 2011, 71.8 million people participated in wildlife watching activities, spending \$54.9 billion in equipment and trip related expenses. This is a 1% increase in participation and a 7% increase in expenditures since 2006. The popularity of non-consumptive wildlife recreation and the associated economic activity provides incentives for wildlife conservation and protection. Periodic assessment of these expenditures and their economic contributions to local and regional economies provides critical base-line information about the importance of wildlife resources to wildlife resource managers and policy makers. Input-output models were constructed for each of the thirteen states in the U.S South² and used to derive industry output, employment, total income, and value-added for 2006 and 2011 – the latest two National Survey of Fishing Hunting and Wildlife Associated Recreation surveys. This approach provided an initial comparison of the relative importance of non-consumptive wildlife recreation across the region and over time. Expenditures by wildlife viewers in the South remained flat from 2006 to 2011 but decreased as a share of the national totals. At the state level, wildlife watching expenditures increased substantially in Alabama, Kentucky, Louisiana, Mississippi and Oklahoma but decreased substantially in Arkansas, Florida, North Carolina, South Carolina, Tennessee, Texas, and Virginia. Regionally, wildlife watching related employment fell considerably over the period although there were increases in Georgia, Louisiana, and Mississippi.

Management implications

These results portray the potential economic contribution of policies fostering new investments in wildlife watching activities. This information can be used to estimate the potential economic benefits of programs and policies designed for wildlife watching activities and related infrastructure projects and services to wildlife viewers. It also illustrates that there is substantial variation between states and any one-size-fits-all program would meet with varying degrees of success across the region. Local conditions must be considered when developing and targeting programs and policies. Similarly, variations over time, both regionally and intra-regionally can be substantial.

1. Introduction

Non-consumptive wildlife-associated recreation activities, such as wildlife watching, wildlife photography, and bird watching and feeding, are popular recreational activities for many people. These services

provided by wildlife ecosystems are increasingly recognized as an essential component of some economies and their associated values provide incentives for wildlife conservation and protection (Hvenegaard, Butler, & Krystofiak, 1989). Each year millions of Americans participate in wildlife-associated recreation activities. In 2006, 71 million people participated in wildlife watching activities, spending \$45.7 billion on equipment and trip-related expenses. There was an 8% increase in participation and a 4% increase in expenditures since 2001 (USDOL, 2006). Similarly, 71.8 million people participated in wildlife watching activities in 2011. They spent 7% more on trips and equipment compared to 2006. Furthermore, the value that participants place on wildlife watching activities has been steadily increasing as measured by their willingness to pay (O'Donnell, 2016). Understanding how these changes in expenditures over time (2006–2011), and across states result in different economic contributions to state economies is critical for policy makers. Rural communities captured a large part of this spending by providing wildlife recreation related goods and services, which in turn, generated jobs and income (Benson, 2001;

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E-mail addresses: jpoudel@CFR.MsState.Edu, jzp0046@auburn.edu (J. Poudel), iam1@msstate.edu (I.A. Munn), jeh149@msstate.edu (J.E. Henderson).¹ Present address: School of Forestry and Wildlife Sciences, Auburn University, 602 Duncan Drive, Auburn, AL 36849, USA.² The U.S South includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas and Virginia.<http://dx.doi.org/10.1016/j.jort.2016.09.008>

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Ingram & Lewandrowski, 1999). It is critical to identify wildlife recreation related goods and services that support rural development and consumption and develop new ways to rejuvenate rural economies (Aylward, Hartwell, Lurie, & Duncan, 2009). Comparison of the 2006 and 2011 survey data and associated economic contributions provides insight into the dynamic nature of wildlife-watching activities and their role in regional and state economies.

Expenditures from wildlife watching activities generate employment and income in various manufacturing industries and service sectors when businesses respond to the demand for equipment and trip related goods and services. Wildlife watching activities have attracted interest from many communities, organizations, and public agencies as a way to promote and accommodate wildlife-associated programs and policies (Leones, Colby, & Crandall, 1998). This interest may initially have arisen because of the economic benefits or for preservation purposes; however, it creates opportunities for educating the public about natural resources and rural development (Cole & Scott, 1999). Wildlife watching expenditures generate direct, indirect and induced effects when industries respond to final demand changes by providing goods and services for wildlife viewers. Direct effects occur when wildlife viewers purchase related equipment at retail stores (e.g. binoculars, cameras, lens etc.) and services to support for their wildlife watching activities (e.g. food, lodging, transportation, rental vehicles, fees, etc.). Indirect effects are initiated when the directly impacted industries (retail and service stores) make purchases from local companies in order to create their product (e.g., the retailer pays electric bills and purchases binoculars and cameras and their accessories for resale from manufacturers and wholesalers). These companies then make local purchases from other local firms and the rounds of indirect effects continue until all indirect effects are derived from outside the region of interest. Induced effects are generated as a result of employees in the direct and indirectly impacted industries spending their wages on locally produced goods and services (e.g., employees buying meals in local restaurants, paying federal and state taxes, etc.). The total effect is the summation of direct, indirect and induced effects. This paper determines the economic contribution of wildlife watching recreation expenditures across the southern U.S. states using 2006 and 2011 expenditures data.

In 1996, 62.9 million people participated in wildlife watching activities, spending \$29.2 billion in trip-related expenses and equipment (USDOJ, 1996). In 2001, 66.1 million people spent \$38.4 billion for wildlife watching activities, an increase of 31.4%. (USDOJ, 2001). In 2006, 71.1 million people spent \$45.7 billion for wildlife watching activities, an 18.8% increase since 2001 and a 56.2% increase since 1996. The most recent 2011 survey data reports 71.8 million people participated in wildlife watching activities, spending \$54.8 billion for trips and equipment. In addition to these direct expenditures, there are indirect and induced impacts that arise when industries respond to demand for wildlife-associated goods and services (Henderson, Grado, Munn, & Jones, 2010; Munn, Hussain, Spurlock, & Henderson, 2010; Steinback, 1999). Few studies have examined the economic contribution of wildlife watching expenditures at the state and county level. During 2001, \$562 million was spent by wildlife viewers, generating a total output of \$940 million and 13,000 jobs in Colorado's economy (Pickton & Sikorowski, 2004). At the national level in 2006, wildlife watching expenditures of \$45.7 billion generated \$122.6 billion in total output across the U.S., where each \$1 of direct spending associated with wildlife watching generated an additional \$1.68 of economic activity (Leonard, 2008). At the regional level, Munn et al. (2010) estimated the economic impact of wildlife watching expenditures in the southern U.S. Wildlife viewers in these states spent \$13.4 billion, which generated \$21.3 billion in total output and generating 168,380 jobs. Several studies have estimated the economic impact of wildlife-associated recreation expenditures which quantify and evaluate economic activities measured by indicators such as sales, income, employment, and value-added. Some studies focused on the county level (e.g.,

Schorr, Sah, Schreiner, Meador, & Hill, 1995; Ditton, Graefe, & Lapotka, 1980), state level (e.g., Bell, Sorensen, & Leeworthy, 1983; Henderson et al., 2010), multistate regional level (e.g., Talhelm, 1988) or on regions of various sizes and activities (e.g., Steinback, 1999; Pickton & Sikorowski, 2004; Hussain, Munn, Holland, Armstrong, & Spurlock, 2012; Poudel, Henderson, & Munn, 2016). Although some literature evaluating different forms of recreational expenditures at different levels exists, research comparing the economic contributions of wildlife watching recreation expenditures between two survey periods and across states is lacking. Addressing this gap in the literature is important because wildlife watching recreation expenditures and their economic contribution can vary substantially from state to state due to differences in the wildlife resource, the state economies, the number of participants and type of activities (e.g., wildlife photography, bird watching, and wildlife feeders) and their expenditure patterns. These factors can also shift over time. Hence, periodic assessments of economic contributions associated with wildlife watching recreation expenditures are necessary to provide a consistent and current accounting of the importance of wildlife-watching recreational activities at the state and regional level. In particular, such assessments show how differences in individual state economies affect total economic contribution of recreation related activities. Differences in the economic contribution of wildlife watching activities across states and over time illustrate the importance of understanding intra-regional variations in establishing wildlife recreation dependent policies.

This paper focused on wildlife watching expenditures in the southern U.S., which accounted for 30% of the overall U.S wildlife watching expenditures (Munn et al., 2010). Most public forestland, such as parks and wildlife refuges, can be used for wildlife watching recreational purposes whereas use of privately owned land depends on the landowner. The southern region of the U.S. provides some unique wildlife watching opportunities on public lands, such as the Great Smoky Mountains; however, the southern region is largely privately owned (Birch, Lewis, & Kaiser, 1996). These different features likely induce different expenditure patterns than in other regions of the U.S. and subsequently different regional economic contributions. Given that wildlife watching activities and forest management are closely inter-linked in programs and policies, it is appropriate that economic contributions associated with wildlife watching recreation expenditures be analyzed at the same geographic scale as forest based industries (e.g., Tilley & Munn, 2007) to provide a similar perspective on the region's wildlife resource. This paper compares the economic contribution of wildlife watching expenditures across the thirteen southern states using the 2006 and 2011 National Survey of Fishing, Hunting and Wildlife-Associated Recreation data and 2009 and 2011 IMPLAN data and establishes baseline information on the contributions of wildlife-watching expenditures, which is necessary for tracking changes in these expenditures and their related economic contributions over time.

2. Theoretical framework

Researchers typically estimate the economic value of wildlife-associated recreation by consumptive and non-consumptive users using either contingent valuation or travel cost methods. However, these techniques do not provide all the economic details policy makers need for appropriately allocating resources to wildlife resource management issues. Economic impact analysis supplements the information provided by such methods (Cooper et al., 2002). It is a useful tool for understanding how the purchases of goods and services impact the various sectors of an economy and to what degree. Input-output (I-O) modeling is a commonly used approach for performing economic impact analysis (Steinback, 1999). This system describes product flows between industrial sectors, with industrial sectors as producers (Miller & Blair, 2009). I-O models the inter-industry linkages and quantifies the net economic contribution by adjusting for leakages induced by

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