

Directed Research Program Objective 4**Description and assessment of the economic and biological feasibilities for alternative wildlife- and fisheries-based enterprises**

Investigators: S.C. Grado, I.A. Munn, Forestry; W.D. Jones, Wildlife and Fisheries

Project Goal:

Through a comprehensive assessment and analysis program, obtain empirically-based information concerning the overall economic, biological, and social potential of existing resources; the economic and technical aspects of alternative enterprises; existing legal, biological, and economic constraints; supportive and hindering policies and related issues; and community impacts of implementing alternative wildlife and/or fisheries commercial enterprises within current and estimated future land use strategies.

Project Objectives:

Estimate the economic and social benefits and costs of wildlife/ fisheries alternative enterprises to local communities.

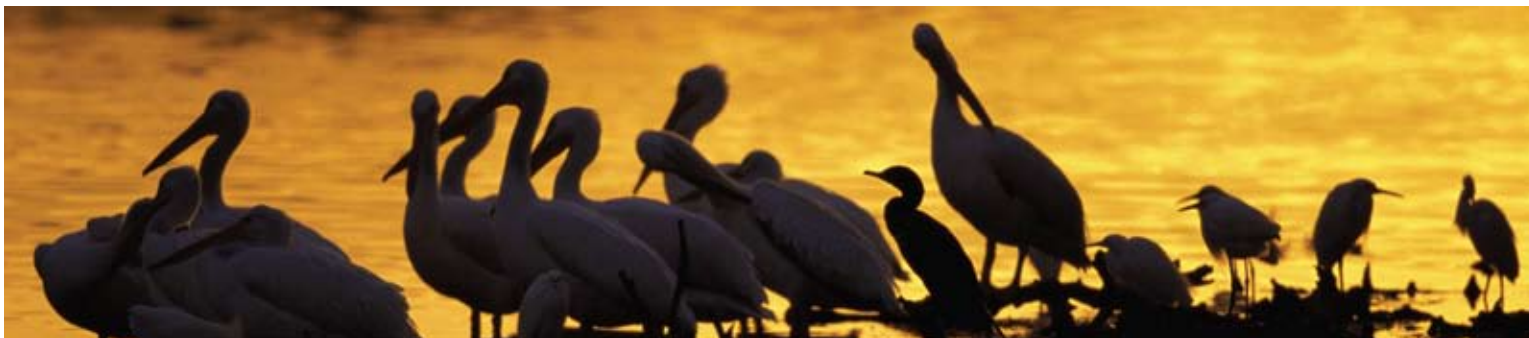
Synopsis of research activities per objective:

A thorough literature and database search was conducted. The search focused on nature-based tourism, which included wildlife- and fisheries-based enterprises, hunting leases, camping, hiking, fishing, recreation (e.g., horseback riding), wildlife-related activities (e.g., bird-watching), and other land based recreational activities.

This project developed accurate inventories of ongoing wildlife/

fisheries and other alternative enterprises (WAEs) by using public information, previous research studies, and undertaking new research to determine the types and number of operations, operation and client expenditure profiles, and levels of activity for these entities. The business operations of enterprises were also determined from how, how much, and where dollars were spent to operate businesses to the types, numbers, and residences of clientele. Information of interest was obtained from business and/or landowners and included revenues and expenditures (e.g., client fees, equipment, supplies, fuel), and number and seasonality of employees. Client information consisted primarily of expenditure habits, residency, and location of purchases.

A preliminary review of state and federal landowner assistance cost-share programs (i.e., Conservation and Wetlands Reserve Programs, Wildlife Habitat Incentives Program) offering financial incentives to agricultural producers and forest landowners to promote wildlife habitats and water quality improvements within watersheds was also completed. Survey results found that private landowners experienced high levels of satisfaction with their cost-share program arrangement. Most landowners indicated that agency staff had inspected management practices on their enrolled lands. The major motivations behind the



decision to enroll in a program included the desire to be a good land steward, to increase wildlife on property, to control erosion, to establish additional income, and to increase hunting opportunities for self/family while landowners did not appear interested in fee access wildlife recreation. Most landowners also indicated that no problems had been encountered on their land because of enrolling. Strict eligibility requirements was the most cited problem related to the enrollment process, however this rating was not very strong.

A natural resource enterprise Web site was developed allowing landowners to advertise and market their recreational properties to potential outdoor clients. User groups (i.e., hunters, wildlife watchers) can view geospatial maps of land coverages of private lands, planted crops and forest coverages, wildlife management areas, and national wildlife refuges as candidate areas for outdoor recreation. Outdoor enthusiasts can submit an online request for information and leasing options available on recreational lands owned by landowners. Thus, landowners are given these inquiries and may contact these individuals to

discuss leasing options on available recreational properties. This Web site was designed for Mississippi and is being adapted to Arkansas, Louisiana, Alabama, Tennessee, and Georgia for deployment in June 2008.

A survey of rural land sales in the state with the Mississippi Chapter of the American Society of Farm Managers and Rural Appraisers to determine the influence, if any, on land valuation due to outdoor recreation was conducted. Lastly, a survey of the 115 outfitter enterprises that operated in Mississippi in 2003 was conducted. Fifty outfitters provided detailed information on revenues earned and expenses incurred by expense category. Outfitter enterprises generated 500 jobs and generated overall tax receipts to the federal, state and local governments totaling \$6 million.

Significant findings/results per objective to date:

This study will be based on previous work and estimates that were derived before and after Hurricanes Katrina and Rita. These storms have changed the entire structure of the State's

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economy, which includes both the suppliers and the demanders of outputs from WAEs. Currently, available models reflect these changes. For example, the most current economic impact software models the 2006 Mississippi economy, having skipped 2005. Typically, studies similar to this assume that changes in the economy between the date of model development and model application are minor and the results reasonably reflect current conditions. The Mississippi economy, however, has been drastically changed. It cannot be assumed that current available models and other economic estimates accurately portray the post Katrina/Rita economy.

The project identified most types and numbers of WAEs

currently operating in the State. Expenditure profiles for each type of WAE and their clientele, and typical levels of economic activity (i.e., attendance) for each were identified. Specific information was collected and economic impact assessments completed on owners/operators and their respective clientele for charter boat enterprises, freshwater fee fishing enterprises, archery range enterprises, gun range enterprises, corn maze enterprises, paintball field enterprises, wildlife watching enterprises, and horse trail riding enterprises. Considerable information has also been collected for Mississippi outfitters and guides and an economic impact assessment of outfitters and their clientele has been completed. A manuscript reporting the results of this study has been completed and is currently under

review at Human Dimensions of Wildlife.

An economic impact analysis was conducted for the WAEs to determine their monetary benefits to the State economy. All economic impact assessments were inflated to a common year (2008) so that they can be summed to a grand total for Mississippi. These assessments will include the following recreation-related activities: outfitters and guides, charter boats, fee fishing, archery ranges, gun ranges, corn mazes, paintball fields, wildlife watching, and horse trail riding.

Based on survey data of Mississippi wildlife-associated outfitters and their clientele, economic impacts were simulated in 2003 dollars induced by their direct expenditures at the state level and by species type (white-tailed deer - *Odocoileus virginianus*, Northern bobwhite - *Colinus virginianus*, waterfowl - *Anas* spp.). Results indicated that in 2003, expenses incurred by outfitters generated \$20.4 million in total industry output, \$9.7 million in value-added and supported 250 full- or part-time jobs, whereas expenses incurred by clientele generated \$2.6 in total industry output, \$1.3 million in value added and supported 42 full- or part-time jobs. By conservative estimates, the Mississippi wildlife-associated outfitters constitute a \$20 million industry on an annual basis.

An economic impact assessment had been previously done for charter boat operators and their clientele and fee-fishing operators in Mississippi. For charter boat operators, total economic impacts ranged from \$2.5 million to \$3.3 million, annually (2001 dollars). This supported 29 to 38 full- and part-time jobs. Clientele total economic impacts averaged \$3.4 million (2001 dollars) supporting 60 full- and part-time jobs.

The expenditures for freshwater fee fishing enterprises (N=25) and their clientele lead to an economic impact for the State of \$1,195,135 (2008 dollars), which supported 17.7 full- and part-time jobs. This resulted in a multiplier effect of 1.52, meaning that for each dollar expended in the State for fee fishing, there was a \$1.52 economic impact generated. The expenditures for archery range operations (N=20) and their clientele lead to an economic impact for the State of \$808,667 (2008 dollars), which supported 14.5 full- and part-time jobs. This resulted in a multiplier effect of 1.62, meaning that for each dollar expended in the State at a private archery range, there was a \$1.62 economic impact generated. The expenditures for gun range operations (N=30) and their clientele lead to an economic impact for the State of \$7,887,355 (2008 dollars), which supported 138.7 full- and part-time jobs. This resulted in a multiplier effect of 1.59, meaning that for each dollar expended

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Wildlife/Fisheries and Other Alternative Enterprises				
Operation	Number	Economic Impact	Jobs	Multiplier
Fee Fishing	25	\$1,195,135	17	1.52
Archery Ranges	20	\$808,667	14	1.62
Gun Ranges	30	\$7,887,355	138	1.59
Corn Mazes	15	\$3,425,834	41	1.53
Paintball Fields	20	\$6,143,931	70	1.52
Wildlife Watching	25	\$1,046,280	12	1.57
Horse Trail Riding	20	\$3,583,135	46	1.55
Total	155	\$24,090,337	341	1.55

in the State at a gun range, there was a \$1.59 economic impact generated. The expenditures for maze operations (N=15) and their clientele lead to an economic impact for the State of \$3,425,834 (2008 dollars), which supported 41.6 full- and part-time jobs. This resulted in a multiplier effect of 1.53, meaning that for each dollar expended in the State at a maze operation, there was \$1.53 in economic impact generated. The expenditures for paintball field operations (N=20) and their clientele lead to an economic impact for the State of \$6,143,931 (2008 dollars), which supported 70.7 full- and part-time jobs. This resulted in a multiplier effect of 1.52, meaning that for each dollar expended in the State at a paintball field, there was \$1.52 in economic impact generated. The expenditures for wildlife-watching operations (N=25) and their clientele lead to an economic impact for the State of \$1,046,280 (2008 dollars), which supported 11.9 full- and part-time jobs. This resulted in a multiplier effect of 1.57, meaning that for each dollar expended in the State for wildlife watching at a fee-facility, there was \$1.57 in economic impact generated. The expenditures for horse trail riding operations (N=20) and their clientele lead to an economic impact for the State of \$3,583,135 (2008 dollars), which supported 46.4 full- and part-time jobs. This resulted in a multiplier effect of 1.55, meaning that for each dollar expended in the State for a horse trail ride,



there was \$1.55 in economic impact generated.

The combined expenditures for owners/operators and their respective clientele for freshwater fee fishing, archery ranges, gun ranges, mazes, paintball fields, wildlife watching, and horse trail riding resulted in a total economic impact to the State of \$24,090,337 (2008 dollars) supporting 341.5 full- and part-time jobs. This resulted in a multiplier effect of 1.55, meaning that for each dollar expended in the State on these WAEs, there was \$1.55 in economic impact generated.

Scientists could not obtain geospatial data on lands enrolled in Farm Bill Programs (i.e., Conservation and Wetlands Reserve Programs) from the U.S. Department of Agriculture as originally proposed due to landowner privacy issues. However, through the development of the aforementioned Web site, we have obtained geospatial data for Mississippi showing public recreational areas and water bodies, forested and agricultural

land coverages, roads and highways, towns and cities, wildlife management areas, national wildlife refuges, and private lands. This Web site will be expanded to the states of Arkansas, Louisiana, Alabama, Tennessee, and Georgia. Through this interactive Web site, landowners will be given opportunities to market their properties to resident and nonresident outdoor enthusiasts.

As a component of this research effort, a survey was conducted to evaluate sales values of private rural lands that were purchased for recreational uses in Mississippi from 2002 through 2005. Data was collected from records (N = 100) of land sales (13,559 ha) developed and maintained by the Mississippi Chapter of the American Society of Farm Managers and Rural Appraisers. Most land parcels were located near or in the Mississippi River Delta region with dominant cover types of agricultural crops (43%) or forest cover (52%). Important recreational uses included hunting (100%), off road vehicles

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access (60%), horseback riding (45%), wildlife watching (44%), ecotourism (43%), and fishing (16%). Featured species associated with recreation on these properties were white-tailed deer (*Odocoileus virginianus*; 93%), rabbits (*Sylvilagus* spp.; 65%), wild turkey (*Meleagris gallopavo*; 56%), waterfowl (48%), squirrels (*Sciurus* spp.; 38%), mourning dove (*Zenaida macroura*; 15%), northern bobwhite quail (*Colinus virginianus*; 12%), and other (< 10%). Total sales value of all properties with consideration of recreational opportunities was \$41,675,171.00 or \$3,073.62/ha. Appraisers reported that the sales value of the same properties without recreational uses would have been \$30,709,679.00 or \$2,264.89/ha. Thus, recreational uses contributed an average increase of \$808.73/ha or an increase of 36% in property value. Property characteristics that influenced sales price were hectares of pine-hardwood forests, bottomland hardwood forests, agricultural row crops, and wildlife supplemental food plots. Wildlife and fish recreation contribute to sales values of Mississippi properties. Wildlife professionals should work cooperatively with appraisers and economists to attain this type of information for use in impact assessment and planning of land and water use. Conservation and management of wildlife and fish resources can produce quantifiable increases in land values and sales proceeds. Consideration of value added by outdoor recreation is part of a cost-effective approach

to sustainable economic development in Mississippi.

The rural lands study is being expanded into a statewide inventory of rural land sales and valuation. The expanded project will involve working closely with First South Farm Credit, Federal Land Bank, and Mossy Oak Properties, Inc. to collect appraisals and land sales information.

Unrealized or unsuccessful endeavors of project:

Geospatial data on lands enrolled in Farm Bill Programs (i.e., Conservation and Wetlands Reserve Programs) was not obtainable from the U.S. Department of Agriculture as originally proposed due to landowner privacy issues. There were a few activities that were dropped from the analysis because there was little available information, they were reassessed as not being central to the original objectives, the economic impacts were viewed as insignificant, or there were limited amount of these activities occurring at privately owned locations. These activities included kayaking/canoeing, mountain/road biking, camping, ranches, lodges, vacation cabins, pony rides, petting zoos, Christmas tree farms, wreaths, nurseries, specialty foods, pine straw operations, and basket or wooden utensil-making operations. In addition, since the advent of Hurricane Katrina it is doubtful if the charter boat economic impacts would hold

up; therefore, these values were excluded from the final total economic impacts.

Applications or broader impacts of significant findings, including economic impacts or projected impacts:

This project has developed a methodology that can be used to evaluate Mississippi's nonmarket outputs and activities, as well as establish their baseline values. Marketed outputs from Mississippi's natural resource base are easily assessed; however, assessing nonmarket outputs is more difficult and baseline values are largely non-existent. Comparable nonmarket values are essential to enable land managers and policy makers to make more holistic and comprehensive decisions regarding the market and nonmarket natural resources and their utilization, conservation and preservation. The methodology developed in this project can be applied to individual nonmarket activities and results can be aggregated across activities. The total economic impacts of nonmarket outputs can thus be determined, providing land managers and policy makers the information needed to correctly assess the importance of these nonmarket outputs and activities.

Project success relative to original objectives:

The project has proven to be very successful relative to the original intended objectives.

List post-docs and graduate students with title of thesis or dissertation, if completed, and estimated graduation date:

Sun, X. 2007. Nonindustrial private forest landowner participation in incentive programs and regeneration behavior. Thesis, Department of Forestry, Mississippi State University.

Fund Leveraging	
Mississippi Department of Environmental Quality	\$25,000
US Environmental Protection Agency Wetlands Division	\$196,000
US Fish and Wildlife Service	\$56,859