

# The Economic Impacts of Caddo Lake National Wildlife Refuge

## Economic Impacts of Refuge Recreation

All estimates in this analysis are preliminary and are based on the refuge manager's projected visitation and budget in FY 2009.

Recreation on Caddo Lake NWR would result in expenditures for both activity-related equipment purchases and travel-related goods and services. The economic impacts from recreation expenditures estimated in this report are gross county-wide impacts. The gross county-wide estimates are used as an upper-bound for the net economic impacts of total resident and non-resident spending in the local area (Caddo and Bossier Parishes, LA and Harrison and Marion Counties, TX). All estimates are in 2004 dollars. The economic impacts were estimated using regional input-output models<sup>1</sup> for each of the recreational activities.

“*Total Expenditures*” show the total annual expenditures associated with the indicated recreational activity.

“*Economic Output*” shows the total industrial output generated by recreation-related expenditures. Total output is the production value (alternatively, the value of all sales plus or minus inventory) of all output generated by recreation expenditures. Total output includes the direct, indirect, and induced effects of these expenditures. Direct effects are simply the initial effects or impacts of spending money; for example, spending money in a grocery store for a fishing trip or purchasing ammunition or a pair of binoculars are examples of direct effects. The purchase of the ammunition by a sporting goods retailer from the manufacturer or the purchase of canned goods by a grocery store from a food wholesaler would be examples of indirect effects. Finally, induced effects refer to the changes in production associated with changes in household income (and spending) caused by changes in employment related to both direct and indirect effects. More simply, people who are employed by the grocer, by the food wholesaler, and by the ammunition manufacturer spend their income on various goods and services which in turn generate a given level of output. The dollar value of this output is the induced effect of the initial (or direct) recreation expenditures<sup>2</sup>.

The economic impact of a given level of expenditures depends, in part, on the degree of self-sufficiency of the area under consideration. For example, a county with a high degree of self-sufficiency (out-of-county imports are comparatively small) will generally have a higher level of impacts associated with a given level of expenditures than a county with significantly higher imports (a comparatively lower level of self-sufficiency). Consequently, the economic impacts of a given level of expenditures will generally be less for rural and other less economically integrated areas compared with other, more economically diverse areas or regions.

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<sup>1</sup> The economic impacts of recreational spending were derived using IMPLAN, a regional input-output modeling and software system.

<sup>2</sup> More technically, direct effects are production changes associated with the immediate effects of changes in final demand (in this case, changes in recreation expenditures); indirect effects are production changes in those industries directly affected by final demand; induced effects are changes in regional household spending patterns caused by changes in regional employment (generated from the direct and indirect effects) (Taylor et al. 1993, Appendix E, pg E-1).

“*Employment and labor income*” include direct, indirect, and induced effects in a manner similar to total industrial output. Employment includes both full and part-time jobs, with a job defined as one person working for at least part of the calendar year, whether one day or the entire year. Labor income in the IMPLAN system consists of both employee compensation and proprietor income (MIG, Inc. 1999).

**Activity Levels**

These activity levels are based on the projected visitation for FY 2009. Visitation data are based on the refuge manager’s best professional judgment.

**Table 1. Caddo Lake NWR: Projected 2009 Recreation Visits**

<b>Activity</b>	<b>Residents</b>	<b>Non-Residents</b>	<b>Total</b>
<b>Non-Consumptive:</b>			
Nature Trails	2,051	8,205	10,256
Observation Platforms	103	410	513
Other Wildlife Observation	6,564	26,256	32,821
Horseback Riding	1,026	4,103	5,128
Other Recreation	1,923	641	2,564
<b>Hunting:</b>			
Big Game	1,538	1,538	3,077
Small Game	3,231	1,385	4,615
Migratory Birds	0	0	0
<b>Fishing:</b>			
Freshwater	923	103	1,026
Saltwater	0	0	0
<b>Total Visitation</b>	<b>17,359</b>	<b>42,641</b>	<b>60,000</b>

**Regional Economic Analysis**

Recreation expenditures were determined by visitation, recreational visitor days (RVD), and average per day expenditures by activity. Counting brief visits as full recreation days would vastly overestimate the visitor spending attributable to the refuge. In this study, a full recreational day is considered as eight hours. Thus, a visitor who spends 4 hours at a refuge has spent half of an RVD, and half of their expenditures for the day will be attributed to the refuge. The average length of time visitors participate in each activity is used to determine the number of RVDs for that activity. The refuge manager estimated the average lengths of stay for each

activity available on the refuge and the typical behavior pattern of visitors. Daily expenditures by activity are from the *2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*<sup>3</sup>. Due to time constraints, this analysis uses the average expenditures for FWS Region 2 (Arizona, New Mexico, Oklahoma, and Texas).

**Table 2. Caddo Lake NWR: Visitor Recreation Expenditures  
(2004 \$,000)**

<b>Activity</b>	<b>Residents</b>	<b>Non-Residents</b>	<b>Total</b>
<b>Non-Consumptive:</b>	\$88	\$1,393	\$1,481
<b>Hunting:</b>			
Big Game	\$54	\$244	\$299
Small Game	\$41	\$68	\$109
Migratory Birds	\$0	\$0	\$0
<b>Total Hunting</b>	\$96	\$312	\$408
<b>Fishing:</b>			
Freshwater	\$20	\$7	\$27
Saltwater	\$0	\$0	\$0
<b>Total Fishing</b>	\$20	\$7	\$27
<b>Total Expenditures</b>	<b>\$203</b>	<b>\$1,713</b>	<b>\$1,916</b>

Local economic effects were determined using IMPLAN, a type of software for input-output analysis. The local area includes Caddo and Bossier Parishes, LA and Harrison and Marion Counties, TX.

**Table 3. Caddo Lake NWR: Local Economic Effects Associated with Recreation Visits  
(2004 \$,000)**

	<b>Residents</b>	<b>Non-Residents</b>	<b>Total</b>
Final Demand	\$321	\$2,651	\$2,972
Jobs	5	36	41
Job Income	\$104	\$863	\$966
Total Tax Revenue	\$40	\$354	\$394

Refuge budget expenditures contribute to local and regional economies. Table 4 summarizes the

<sup>3</sup> Per-person per-day expenditure information is based on the 2001 National Survey of Fishing, Hunting and Wildlife Associated Recreation (NSFHWR). This survey is conducted every 5 years by the U.S. Fish and Wildlife Service. Expenditure categories include: (1) **food**, including food, drink, and refreshments; (2) **lodging**, which includes lodging at motels, cabins, lodges, or campgrounds; (3) **transportation**, which includes both public transportation and the round-trip cost of transportation by private vehicle; and (4) **other**, which encompasses guide fees, pack trip or package fees, public land use or access fees, private land use or access fees (not including leases), equipment rental, and miscellaneous retail expenditures.

economic impact of both salary and non-salary budget expenditures. Separate input-output models were used to estimate the impacts of local spending, regional (in-state but not local), and out-of-state spending for both salary and non-salary expenditures. These estimates are based on the projected 2009 Refuge budget (\$390,000 for salary and \$260,000 for non-salary expenditures).

**Table 4. Caddo Lake NWR: Local Economic Effects Associated with Refuge Budget Expenditures (2004 \$,000)**

	<b>Salary</b>	<b>Non-Salary</b>	<b>Total</b>
Final Demand	\$522	\$442	\$963
Jobs	4	5	9
Job Income	\$126	\$312	\$438
Total Tax Revenue	\$47	\$55	\$102

## REFERENCES

Minnesota IMPLAN Group, Inc. *IMPLAN System (2002 data and software)*. 1940 South Greeley Street, Suite 101, Stillwater MN 55082. 2002.

U. S. Department of the Interior, U.S. Fish and Wildlife Service, Division of Federal Aid. *2001 National Survey of Fishing, Hunting, and Wildlife Associated Recreation* (CD-ROM.) Washington, D.C. May 2002.