

The Economic Contributions of Recreational Visitation at Arthur R. Marshall Loxahatchee National Wildlife Refuge

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This paper establishes the economic contribution baseline for recreational visitation at Arthur R. Marshall Loxahatchee National Wildlife Refuge National Wildlife Refuge (Refuge). The paper addresses the levels of Refuge recreational activities and the economic effects of Refuge recreational activities. The analysis is followed by a glossary of terms. For more information regarding the methodology, please refer to “Banking on Nature – The Economic Contributions to Local Communities of National Wildlife Refuge Visitation” at <https://www.fws.gov/economics/divisionpublications/divisionpublications.asp>.

From an economic perspective, Arthur R. Marshall Loxahatchee National Wildlife Refuge National Wildlife Refuge provides a variety of environmental and natural resource goods and services used by people either directly or indirectly. The use of these goods and services may result in economic effects to both local and state economies. The various services the Refuge provides can be grouped into five broad categories: (1) maintenance and conservation of environmental resources, services and ecological processes; (2) protection of natural resources such as fish, wildlife, and plants; (3) protection of cultural and historical sites and objects; (4) provision of educational and research opportunities; and (5) outdoor and wildlife-related recreation. A comprehensive economic profile of the Refuge would address all applicable economic effects associated with the use of refuge-produced goods and services. However, some of the major contributions of the Refuge to the natural environment, such as watershed protection, maintenance and stabilization of ecological processes, and the enhancement of biodiversity are beyond the scope of this paper. Therefore, this paper focuses on economic effects associated with recreational visitation. As a result, benefits represent conservative estimates and do not represent the Refuge’s total social impacts.

Refuge Description

Arthur R. Marshall Loxahatchee National Wildlife Refuge is a 145,062-acre unit protecting the last remaining portion of the unique northern Everglades. The Refuge protects endangered species such as the snail kite, wood stork, and tropical curly grass fern. The Refuge also protects species like the American alligator and red-bellied turtles. The Refuge is comprised of five different habitat types: tree islands, wet prairies, sloughs, sawgrass communities, and the largest remnant of a cypress swamp in Palm Beach County, FL. The Refuge offers wintering habitat for migratory waterfowl and nesting or foraging habitat for wading and shorebirds. The Refuge offers hunting, fishing, boating, hiking, bicycling, and wildlife observation. Boat ramps are available at all three Refuge entrances: Headquarters Area, Hillsboro Area, and 20-Mile Bend Area.

An observation tower, observation platform, fishing platform, and nature trails are found at the Headquarters Area. The 0.4 mile Cypress Swamp Boardwalk trail meanders where visitors can see several types of ferns and lichens as well as the majestic cardinal wild pine. The 0.8 mile Marsh Trail is an open levee trail that’s a bird watcher’s paradise where wading birds, shorebirds, and migratory waterfowl can be seen. Visitors get a close-up and personal view of the Refuge along the 5.5 mile canoe trail beginning at the Headquarters Area. Dozens of miles of levees are open to the public for hiking and bicycling. The Visitor Center has state-of-the-arts exhibits and an introductory Refuge video. The Refuge Calendar of Events offers guided bird, butterfly and plant walks, tram tours, guest lecturers, and an annual art and photo contest from November through April.

The Refuge bird list boasts 257 species that use the Refuge as a migration, wintering, or breeding location. Situated in Palm Beach County, Florida the Refuge is within 100 miles of 6 million people. Arthur R. Marshall Loxahatchee National Wildlife Refuge is visited each year by nearly 400,000 people from around the world who come to enjoy and learn about this fragile ecosystem. The Refuge provides environmental education programs for over 23,000 school children every year.

Activity Levels

Table 1 shows the recreation visits for the Refuge. The Refuge had about 369,000 recreational visits in 2017 which contributed to the economic effect of the Refuge. Non-consumptive recreation accounted for about 313,000 visits with residents comprising 85 percent of Refuge visitation.

Table 1. Arthur R. Marshall Loxahatchee NWR: 2017 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	60,557	49,547	110,104
Auto Tour	-	-	-
Boat Trail/Launch	66,088	44,059	110,147
Bicycle	14,863	2,623	17,486
Photography	11,789	7,860	19,649
Interpretation	5,588	1,863	7,451
Other Recreation	-	-	-
Visitor Center	12,068	36,204	48,272
Hunting:			
Big Game	28	28	56
Small Game	-	-	-
Migratory Birds	967	242	1,209
Fishing:	36,865	18,157	55,022
Total Visitation	208,814	160,582	369,396

Source: Refuge Annual Performance Plan 2017 and Refuge Staff

Regional Economic Analysis

The economic area for the Refuge is Palm Beach County, Florida. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2017 are shown in Table 2. Total expenditures were about \$17.0 million with non-residents accounting for \$12.8 million or 75 percent of total expenditures. Expenditures on non-consumptive activities accounted for 83 percent of all expenditures.

Spending in the local area generates and supports economic activity within Palm Beach County (Table 3). The contribution of recreational spending in local communities was associated with about 202 jobs, \$8.6 million in employment income, \$1.6 million in total tax revenue, and \$24.6 million in economic output.

Table 2. Arthur R. Marshall Loxahatchee NWR: Visitor Recreation Expenditures (2017 \$,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	\$2,503.2	\$11,640.7	\$14,143.9
Hunting	\$42.4	\$28.3	\$70.6
Fishing	\$1,679.1	\$1,085.8	\$2,765.0
Total Expenditures	\$4,224.7	\$12,754.8	\$16,979.5

Table 3. Arthur R. Marshall Loxahatchee NWR: Local Economic Contributions Associated with Recreation Visits (2017 \$,000)

	Residents	Non-Residents	Total
Economic Output	\$6,238.5	\$18,357.0	\$24,595.5
Jobs	54	148	202
Job Income	\$2,261.4	\$6,333.0	\$8,594.4
State and Local Tax Revenue	\$386.8	\$1,208.6	\$1,595.4

Glossary

Economic Contribution: The economic activity generated in a region by residents and non-resident recreation spending.

Expenditures: The spending by recreational visitors when visiting refuges. Expenditure categories include food, lodging, transportation, and other. Expenditure information is based on the 2011 National Survey of Fishing, Hunting and Wildlife Associated Recreation (NSFHWR).

Economic Output: The total spending by final consumers on all goods. The amount reported in this study is the change in spending by final consumers in the region attributable to refuge visitation. Economic output includes spending by people who earn income from refuge visitors' activities as well as spending by refuge visitors themselves.

Impact: The new economic activity generated in a region as a refuge attracts non-residents to the area. This figure represents economic activity that would be lost if the refuge were not there.

IMPLAN: An economic modeling software package that applies input-output analysis techniques to regional economies.

Jobs: Full and part time jobs.

Job Income: Income to households from labor including wages and salaries.

Resident/Non-Resident: People living more than 50 miles from the refuges are considered non-residents for this study.

Tax Revenue: Local, county and state taxes: sales tax, property tax, and income tax

Visitors: A visitor is someone who comes to the refuge and participates in one or more of the activities available at the refuge.

Visits (visitation): A visit is not the same as a visitor. One visitor could be responsible for several visits on a refuge. For example, if a family of four went fishing in the morning and hiked a short nature trail in the afternoon, they would have contributed eight activity visits to the refuge; yet, they are only four visitors.

References

Minnesota IMPLAN Group, Inc. *IMPLAN System (2015 data and software)*.

U. S. Department of the Interior, U.S. Fish and Wildlife Service, Division of Federal Aid. 2013. *2011 National Survey of Fishing, Hunting, and Wildlife Associated Recreation*. Washington, D.C.

U.S. Department of the Interior, U.S. Fish and Wildlife Service, National Wildlife Refuge System. *Refuge Annual Performance Plan 2017*. Washington, D.C. Unpublished.

Varian, Hal R. 2010. *Intermediate Microeconomics: A Modern Approach*. 8th ed. New York: W.W. Norton & Company.