

The Economic Contributions of Recreational Visitation at Erie National Wildlife Refuge

May 2019
Division of Economics
U.S. Fish & Wildlife Service

This paper establishes the economic contribution baseline for recreational visitation at Erie 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, Erie 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

The 8,815-acre Erie National Wildlife Refuge lies 35 miles south of Lake Erie in northwestern Pennsylvania in the glaciated Appalachian Plateau. The Refuge is entirely within the French Creek Watershed. Considered an ecologically significant watershed nationally as well as in Pennsylvania, the French Creek Watershed contains globally rare freshwater mussels and fish. Erie NWR is the only national wildlife refuge that hosts the Federal and State listed, endangered clubshell and northern riffleshell freshwater mussels. Twenty-two mussel species, dozens of native fishes, and several rare plants and natural communities are found in the Muddy-Dead Creek drainage in the Seneca Division of the refuge. The Sugar Lake Division, 10 miles south, is more actively managed with a series of freshwater impoundments and natural stream drainages, wetland complexes, and uplands of mature forest, shrublands, and grasslands.

The Refuge has two separate divisions: the 5,229-acre Sugar Lake Division and the 3,586-acre Seneca Division. The Sugar Lake Division lies 10 miles east of Meadville on the outskirts of Guys Mills village. The Seneca Division is about 10 miles north of the Sugar Lake Division or four miles southeast of Cambridge Springs. The refuge headquarters and visitor contact station are located in Guys Mills.

The Sugar Lake Division lies in a narrow valley. The northern section encompasses the headwaters and mainstem of Woodcock Creek, draining north and then west into French Creek. The southern section, starting slightly north of Route 198, encompasses the headwaters of Lake Creek that drains south into the 90-acre Sugar Lake. Sugar Creek drains the lake and eventually flows into French Creek, about 4.5 miles above the confluence with the Allegheny River. Beaver ponds, man-made pools, and various types of

forested, scrub-shrub and emergent wetlands along the creeks are bounded by upland forested slopes interspersed with actively managed croplands, grasslands, and wet meadows. The Sugar Lake Division contains several natural communities of conservation concern, including mixed shrub wetland and red maple-black ash palustrine forest. The approved acquisition boundary for the Sugar Lake Division is 5,240 acres.

The Seneca Division is situated in a forested valley encompassing the Muddy Creek drainage, a major tributary to French Creek, and Dead Creek that flows into Muddy Creek. Muddy Creek supports rare freshwater mussels and fish, abundant scrub-shrub and forested wetlands in riparian areas, as well as a rare shrub fen community. The Dead Creek riparian system contributes extensive marsh habitat and supports rare plants and fish habitats. The riparian system created by Muddy Creek and Dead Creek contains numerous types of forested, scrub-shrub and emergent wetlands characteristic of the glaciated region of northwest Pennsylvania. The approved acquisition boundary for the Seneca Division is 4,345 acres.

Both divisions lie within the French Creek Watershed, which covers roughly 117 miles stretching from western New York through Erie, Crawford, Mercer and Venango Counties, in Pennsylvania, before converging with the Allegheny River. The French Creek Watershed covers approximately 1,235 square miles (790,400 acres) (Western Pennsylvania Conservancy & French Creek Projects).

Activity Levels

Table 1 shows the recreation visits for the Refuge. The Refuge had about 30,000 recreational visits in 2017 which contributed to the economic effect of the Refuge. Non-consumptive recreation accounted for about 17,000 visits with residents comprising 73 percent of Refuge visitation.

Table 1. Erie NWR: 2017 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	4,380	2,920	7,300
Auto Tour	-	-	-
Boat Trail/Launch	-	-	-
Bicycle	-	-	-
Photography	4,900	2,100	7,000
Interpretation	1,795	317	2,112
Other Recreation	16	-	16
Visitor Center	543	293	836
Hunting:			
Big Game	5,665	1,888	7,553
Small Game	866	289	1,155
Migratory Birds	676	169	845
Fishing:	3,285	365	3,650
Total Visitation	22,127	8,340	30,467

Source: Refuge Annual Performance Plan 2017 and Refuge Staff

Regional Economic Analysis

The economic area for the Refuge is Crawford County, Pennsylvania. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2017 are shown in Table 2. Total expenditures were \$553,000 with non-residents accounting for \$310,000 or 56 percent of total expenditures. Expenditures on non-consumptive activities accounted for 47 percent of all expenditures.

Spending in the local area generates and supports economic activity within Crawford County (Table 3). The contribution of recreational spending in local communities was associated with about 8 jobs, \$227,000 in employment income, \$59,000 in total tax revenue, and \$722,000 in economic output.

Table 2. Erie NWR: Visitor Recreation Expenditures (2017 \$,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	\$65.0	\$195.4	\$260.4
Hunting	\$126.1	\$100.7	\$226.7
Fishing	\$52.0	\$13.6	\$65.6
Total Expenditures	\$243.2	\$309.6	\$552.8

Table 3. Erie NWR: Local Economic Contributions Associated with Recreation Visits (2017 \$,000)

	Residents	Non-Residents	Total
Economic Output	\$318.6	\$403.7	\$722.3
Jobs	4	4	8
Job Income	\$102.2	\$124.6	\$226.9
State and Local Tax Revenue	\$25.8	\$32.8	\$58.6

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.