

The Economic Contributions of Recreational Visitation at Moosehorn National Wildlife Refuge

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

Moosehorn National Wildlife Refuge provides important feeding and nesting habitat for many bird species, including neo-tropical migrants, waterfowl, wading birds, shorebirds, upland game birds, and birds of prey.

The Refuge serves as a Land Management Research and Demonstration area for the Northern Forest. Unique study areas managed as early succession habitat for American woodcock and late succession forest management areas for Bay-breasted warbler and other species. Black bear, coyote, otter, moose and other wildlife of the North inhabit the refuge and are enjoyed by the public.

The Refuge covers over 29,235 in two divisions. Baring located off U.S. Route 1, southwest of Calais and Edmunds between Dennysville and Whiting on U.S. Route 1 and borders the tidal waters of Cobscook Bay. Each division contains a National Wilderness Area, thousands of acres managed to preserve their wild character for future generations.

Activity Levels

Table 1 shows the recreation visits for the Refuge. The Refuge had about 37,000 recreational visits in 2017 which contributed to the economic effect of the Refuge. Non-consumptive recreation accounted for about 33,000 visits with residents comprising 53 percent of Refuge visitation.

Table 1. Moosehorn NWR: 2017 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	5,253	5,047	10,300
Auto Tour	357	343	700
Boat Trail/Launch	1,887	1,813	3,700
Bicycle	638	613	1,250
Photography	102	98	200
Interpretation	77	74	150
Other Recreation	2,168	2,083	4,250
Visitor Center	6,120	5,880	12,000
Hunting:			
Big Game	270	30	300
Small Game	124	46	170
Migratory Birds	164	81	245
Fishing:	2,680	1,320	4,000
Total Visitation	19,839	17,426	37,265

Source: Refuge Annual Performance Plan 2017 and Refuge Staff

Regional Economic Analysis

The economic area for the Refuge is Washington County, Maine. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2017 are shown in Table 2. Total expenditures were \$1.3 million with non-residents accounting for \$1.0 million or 78 percent of total expenditures. Expenditures on non-consumptive activities accounted for 80 percent of all expenditures.

Spending in the local area generates and supports economic activity within Washington County (Table 3). The contribution of recreational spending in local communities was associated with about 18 jobs, \$414,000 in employment income, \$134,000 in total tax revenue, and \$1.7 million in economic output.

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

Activity	Residents	Non-Residents	Total
Non-Consumptive	\$159.3	\$897.5	\$1,056.9
Hunting	\$16.1	\$10.6	\$26.7
Fishing	\$113.2	\$131.1	\$244.3
Total Expenditures	\$288.6	\$1,039.3	\$1,327.9

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

	Residents	Non-Residents	Total
Economic Output	\$354.2	\$1,319.2	\$1,673.3
Jobs	4	14	18
Job Income	\$88.2	\$325.4	\$413.6
State and Local Tax Revenue	\$30.3	\$103.8	\$134.1

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.