ASSOCIATION of FISH & WILDLIFE AGENCIES

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Economic Return from NAWMP Investments in Canadian Waterfowl Habitat

Within the U.S. plus selected states

Produced for the:

The Association of Fish and Wildlife Agencies

Produced by:

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Executive Summary

In 2022, hunters in the United States are estimated to have spent nearly $1.9 billion while pursuing waterfowl that originated in Canada. That spending supported over 23,500 jobs and contributed more than $2.4 billion to the U.S. Gross Domestic Product. The total economic activity, otherwise known as the total multiplier effect, generated by U.S. waterfowl hunting that targeted birds originating in Canada contributed more than $4.5 billion to the U.S. economy in 2022.

In addition, wildlife watchers in the U.S. spent an estimated $14.3 billion on goods and services to watch waterfowl that originated in Canada. That spending supported almost 160,000 jobs providing $10.1 billion in salaries and wages. The total economic activity associated with watching waterfowl that originated in Canada contributed more than $33.1 billion to the U.S. economy in 2022.

Altogether, hunters and wildlife viewers in the U.S. spent over $16.1 billion to experience waterfowl that originated in Canada, which in turn supported over 183,000 jobs, nearly $11.6 billion in salaries and wages, over $19.6 billion in contributions to the Gross Domestic Product and nearly $38 billion in total economic activity. Investments in waterfowl conservation on both sides of the border support significant economic activity and recreational opportunities for the U.S.

Table ES 1. Economic contributions associated with U.S. hunting and wildlife watching of waterfowl that originated in Canada.

Activity Type	Hunting	Wildlife Watching	Total
Expenditures	$1,881,000,000	$14,288,000,000	**$16,169,000,000**
Total Multiplier Effect	$4,569,000,000	$33,127,000,000	**$37,696,000,000**
Jobs	23,600	159,800	**183,400**
Salaries & Wages	$1,427,000,000	$10,167,000,000	**$11,594,000,000**
GDP Contributions	$2,404,000,000	17,216,000,000	**$19,620,000,000**
State/Local Taxes	$228,000,000	1,822,000,000	**$2,050,000,000**
Federal Taxes	$352,000,000	2,509,000,000	**$2,861,000,000**

Table of Contents

List of Tables

Introduction

For 36 years, the North American Waterfowl Management Plan (NAWMP) has been in place to support waterfowl conservation. With support in part from U.S. state and federal governments, much of the effort has focused on improving waterfowl habitat in Canada, where many species of waterfowl nest each year before migrating to the U.S. and elsewhere. Recently, the Association of Fish and Wildlife Agencies (AFWA) contracted Southwick Associates to study the economic impact that the program has had for the United States. Specifically, the goal was to estimate the economic return to the U.S. in 2022 from hunting and wildlife watching of waterfowl that originate in Canada.

Data & Methods

Proportion of U.S. Waterfowl Originating in Canada

Southwick Associates worked with waterfowl biologists from Ducks Unlimited Canada to estimate the proportion of waterfowl in the U.S. that originate in Canada, which is home to critical nesting habitat for many waterfowl species. The most recent Waterfowl Breeding Population and Habitat Survey (BPOP) or "May Survey" duck data suggests about two-thirds of ducks breed in Canada. Goose data is a bit more complex as population estimates are not as standardized so many more assumptions are involved. However, with consideration of nesting geese and many sub-arctic and arctic nesting geese, it is safe to assume that more than 50% of goose populations are raised in Canada.

While the proportion of U.S waterfowl originating in Canada varies by location, a national estimate was needed for use with the national hunter and wildlife watcher spending data available to this project. After several rounds of discussions, the team experts agreed that, at a minimum, half of waterfowl in the U.S. originate from Canada. Two-thirds of all waterfowl likely originate from Canada, but without the additional analysis of all the relevant data, the team of experts agreed that 50% would be a very conservative estimate. Additionally, there is evidence that some waterfowl species enjoyed by recreationists in the U.S. are almost entirely dependent on Canada for their nesting habitat.

Waterfowl Hunter Spending

Spending by U.S hunters was recently estimated as part of the 2022 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (FHWAR) conducted roughly every six years by the U.S. Fish and Wildlife Service at the request of states' fish and wildlife agencies. The 2022 FHWAR also reported hunting effort by major hunting type: big game, small game, migratory bird and other animals. Effort for waterfowl hunting was not reported directly in the 2022 FHWAR; instead, it was included in the larger category of migratory bird hunting. However, the 2016 FHWAR captured both migratory bird and waterfowl hunting effort. Using the 2016 FHWAR, the ratio of days that migratory bird hunters spent pursing waterfowl in 2016 was calculated. That ratio was applied to the migratory bird hunting effort captured in the 2022 FHWAR, yielding an estimate of the number of days that U.S. hunters spent pursuing waterfowl in 2022.

Since hunting expenditures captured in the FHWAR are not dedicated to a specific type of hunting, a simplifying assumption was made that hunters spend money based on the proportion of days that they spend pursuing a game type. A simple example is that if a hunter spends half of their annual hunting days pursuing waterfowl, then half of that hunter's spending for hunting is assumed to be for waterfowl. Using this assumption, an estimate for national spending on waterfowl hunting was produced. This is a conservative estimate because waterfowl hunting is typically more expensive than other types of migratory bird hunting (e.g., doves, quail, and pheasant).

State-level estimates for waterfowl hunter spending are not available in the 2022 FHWAR. The last reliable state-level estimates for waterfowl hunter spending were produced by the U.S. Fish and Wildlife Service in an addendum report to the 2011 FHWAR titled " Economic Impact of Waterfowl Hunting in the United States". That report included both national estimates of waterfowl hunter spending, as well as state-level estimates for the following states, where sample sizes were adequate: Arkansas, California, Delaware, Kansas, Louisiana, Maryland and South Dakota. The ratio of each state's spending to the national total from 2011 was applied to the 2022 national waterfowl hunter spending total to create an updated estimate for state-level hunter spending in each of those states.

Waterfowl Wildlife Watcher Spending

Spending by U.S. wildlife watchers was also estimated as part of the recent 2022 FHWAR for activities both around the home and away from home. Various steps were taken to derive spending attributable to wildlife watching activities of waterfowl originating from Canada. First, by comparing the number of days spent bird watching to all days viewing wildlife of any type, then applying these percentages to the wildlife viewing spending data from the 2022 FHWAR, total spending for bird watching in 2022 were developed. These estimates were further refined using data from the 2016 FHWAR specific to waterfowl watching activity. The proportion of time bird watchers spent viewing waterfowl and the proportion of their watching time devoted to waterfowl were applied to the 2022 FHWAR spending estimates, yielding spending estimates specific to 2022 waterfowl viewing as well as the numbers of people and days engaged in waterfowl viewing.

A similar simplifying assumption was applied to wildlife watching as it was to hunting, in that the proportion of days spent watching a particular species is a reasonable proxy for the proportion of spending attributable to that activity. This allows for the estimation of a national estimate of spending attributable to waterfowl.

State-level estimates for waterfowl watching across all 50 states were derived in two stages. First, Census Division specific estimates were developed from the 2022 FHWAR. No further regional data were available in the 2022 data set. Therefore, the ratio of a state's spending to the Division's total based on the 2011 FHWAR which contained state-specific data was used to allocate spending to all states within a Division.

Economic Contributions

All economic contribution estimates presented here were calculated using input-output models from IMPLAN. National estimates were produced using a national model of the U.S. economy, while state-level estimates were produced using state-specific models. More information on IMPLAN and input-output models can be found in Appendix B of this report.

Results

All tables follow this initial list:

Table 1 presents U.S. national-level economic contributions resulting from hunting and wildlife watching of waterfowl that originated in Canada.

Table 2 presents state-level economic contributions resulting from hunting of waterfowl that originated in Canada in major waterfowl hunting states.

Table 3 presents state-level economic contributions resulting from wildlife watching of waterfowl that originated in Canada.

Table 1. U.S. National Economic Contribution of Waterfowl Originating in Canada

Activity Type	Expenditures	Total Multiplier Effect	Jobs	Salaries & Wages	GDP Contributions	State/Local Taxes	Federal Taxes
Hunting	$1,881,000,000	$4,569,000,000	23,600	$1,427,000,000	$2,404,000,000	$228,000,000	$352,000,000
Wildlife Watching	$14,288,000,000	$33,127,000,000	159,800	$10,167,000,000	17,216,000,000	1,822,000,000	2,509,000,000
Total	**$16,169,000,000**	**$37,696,000,000**	**183,400**	**$11,594,000,000**	**$19,620,000,000**	**$2,050,000,000**	**$2,861,000,000**

Table 2. Economic Contribution from Hunting Waterfowl Originating in Canada for Select U.S. States

State	Expenditures	Total Multiplier Effect	Jobs	Salaries & Wages	GDP Contributions	State/Local Taxes	Federal Taxes
Arkansas	$358,956,000	$396,887,000	3,040	$126,287,000	$204,224,000	$26,195,000	$29,072,000
California	$196,857,000	$281,068,000	1,540	$100,817,000	$164,167,000	$22,876,000	$24,826,000
Delaware	$6,280,000	$7,837,000	50	$2,854,000	$3,874,000	$303,000	$598,000
Kansas	$7,676,000	$9,771,000	60	$3,030,000	$4,499,000	$594,000	$680,000
Louisiana	$119,317,000	$146,841,000	1,010	$44,320,000	$76,319,000	$9,991,000	$9,580,000
Maryland	$12,708,000	$16,318,000	100	$6,097,000	$8,721,000	$1,113,000	$1,415,000
South Dakota	$46,800,000	$58,748,000	410	$19,554,000	$22,989,000	$2,781,000	$4,141,000

Table 3. State-Specific Economic Contribution from Wildlife Watching of Waterfowl Originating in Canada

State	Expenditures	Total Multiplier Effect	Jobs	Salaries & Wages	GDP Contributions	State/Local Taxes	Federal Taxes
National	$14,288,000,000	$33,127,000,000	159,800	$10,167,000,000	$17,216,000,000	$1,822,000,000	$2,509,000,000
Alabama	$260,000,000	$308,000,000	2,200	$97,000,000	$160,000,000	$20,000,000	$22,000,000
Alaska	$359,000,000	$397,000,000	2,800	$143,000,000	$216,000,000	$12,000,000	$30,000,000
Arizona	$148,000,000	$163,000,000	1,100	$58,000,000	$95,000,000	$12,000,000	$14,000,000
Arkansas	$163,000,000	$209,000,000	1,400	$65,000,000	$106,000,000	$13,000,000	$15,000,000
California	$659,000,000	$920,000,000	5,000	$331,000,000	$534,000,000	$79,000,000	$81,000,000
Colorado	$227,000,000	$255,000,000	1,700	$93,000,000	$149,000,000	$21,000,000	$22,000,000
Connecticut	$246,000,000	$348,000,000	1,800	$117,000,000	$194,000,000	$21,000,000	$31,000,000
Delaware	$59,000,000	$71,000,000	500	$27,000,000	$36,000,000	$3,000,000	$6,000,000
Florida	$1,054,000,000	$1,478,000,000	9,200	$493,000,000	$824,000,000	$77,000,000	$132,000,000
Georgia	$625,000,000	$919,000,000	5,400	$302,000,000	$506,000,000	$41,000,000	$71,000,000
Hawaii	$117,000,000	$125,000,000	800	$43,000,000	$75,000,000	$13,000,000	$10,000,000
Idaho	$69,000,000	$70,000,000	600	$24,000,000	$39,000,000	$5,000,000	$6,000,000
Illinois	$317,000,000	$396,000,000	2,400	$145,000,000	$229,000,000	$31,000,000	$34,000,000
Indiana	$183,000,000	$207,000,000	1,500	$72,000,000	$115,000,000	$16,000,000	$16,000,000
Iowa	$243,000,000	$238,000,000	1,600	$78,000,000	$128,000,000	$15,000,000	$18,000,000
Kansas	$71,000,000	$80,000,000	500	$25,000,000	$41,000,000	$6,000,000	$6,000,000
Kentucky	$274,000,000	$324,000,000	2,200	$107,000,000	$166,000,000	$19,000,000	$23,000,000
Louisiana	$409,000,000	$498,000,000	3,200	$151,000,000	$258,000,000	$35,000,000	$33,000,000
Maine	$210,000,000	$267,000,000	1,600	$87,000,000	$148,000,000	$20,000,000	$21,000,000
Maryland	$168,000,000	$206,000,000	1,300	$78,000,000	$115,000,000	$16,000,000	$18,000,000
Massachusetts	$336,000,000	$491,000,000	2,700	$212,000,000	$255,000,000	$30,000,000	$50,000,000
Michigan	$297,000,000	$370,000,000	2,500	$125,000,000	$204,000,000	$27,000,000	$30,000,000
Minnesota	$213,000,000	$266,000,000	1,500	$89,000,000	$146,000,000	$18,000,000	$21,000,000
Mississippi	$121,000,000	$137,000,000	1,000	$39,000,000	$67,000,000	$10,000,000	$9,000,000
Missouri	$322,000,000	$382,000,000	2,400	$122,000,000	$199,000,000	$20,000,000	$28,000,000

Table 3 (cont). State-Specific Economic Contribution from Wildlife Watching of Waterfowl Originating in Canada

State	Expenditures	Total Multiplier Effect	Jobs	Salaries & Wages	GDP Contributions	State/Local Taxes	Federal Taxes
Montana	$64,000,000	$73,000,000	600	$25,000,000	$37,000,000	$4,000,000	$6,000,000
Nebraska	$176,000,000	$183,000,000	1,200	$59,000,000	$100,000,000	$9,000,000	$14,000,000
Nevada	$108,000,000	$111,000,000	700	$41,000,000	$68,000,000	$8,000,000	$11,000,000
New Hampshire	$74,000,000	$95,000,000	500	$34,000,000	$53,000,000	$4,000,000	$8,000,000
New Jersey	$296,000,000	$379,000,000	2,400	$151,000,000	$226,000,000	$28,000,000	$37,000,000
New Mexico	$52,000,000	$49,000,000	400	$16,000,000	$26,000,000	$4,000,000	$4,000,000
New York	$1,245,000,000	$1,544,000,000	8,100	$575,000,000	$939,000,000	$86,000,000	$141,000,000
North Carolina	$322,000,000	$433,000,000	2,900	$153,000,000	$240,000,000	$21,000,000	$36,000,000
North Dakota	$20,000,000	$22,000,000	100	$7,000,000	$11,000,000	$1,000,000	$1,000,000
Ohio	$180,000,000	$236,000,000	1,600	$79,000,000	$131,000,000	$16,000,000	$18,000,000
Oklahoma	$358,000,000	$444,000,000	2,800	$130,000,000	$217,000,000	$24,000,000	$28,000,000
Oregon	$296,000,000	$349,000,000	2,400	$130,000,000	$204,000,000	$22,000,000	$30,000,000
Pennsylvania	$381,000,000	$513,000,000	2,900	$179,000,000	$280,000,000	$27,000,000	$41,000,000
Rhode Island	$53,000,000	$79,000,000	400	$27,000,000	$42,000,000	$4,000,000	$7,000,000
South Carolina	$162,000,000	$202,000,000	1,400	$65,000,000	$109,000,000	$14,000,000	$16,000,000
South Dakota	$57,000,000	$57,000,000	400	$19,000,000	$31,000,000	$3,000,000	$4,000,000
Tennessee	$334,000,000	$437,000,000	2,700	$149,000,000	$243,000,000	$27,000,000	$34,000,000
Texas	$1,376,000,000	$2,096,000,000	11,700	$662,000,000	$1,134,000,000	$103,000,000	$156,000,000
Utah	$93,000,000	$115,000,000	800	$36,000,000	$63,000,000	$8,000,000	$9,000,000
Vermont	$76,000,000	$88,000,000	600	$30,000,000	$48,000,000	$6,000,000	$7,000,000
Virginia	$332,000,000	$389,000,000	2,400	$134,000,000	$225,000,000	$27,000,000	$33,000,000
Washington	$554,000,000	$689,000,000	3,900	$226,000,000	$414,000,000	$62,000,000	$59,000,000
West Virginia	$113,000,000	$118,000,000	1,000	$39,000,000	$64,000,000	$8,000,000	$8,000,000
Wisconsin	$362,000,000	$395,000,000	3,000	$139,000,000	$222,000,000	$28,000,000	$33,000,000
Wyoming	$56,000,000	$52,000,000	400	$17,000,000	$27,000,000	$4,000,000	$4,000,000

Appendix A. Definitions of Economic Contribution

Economic benefits can be estimated by two types of economic measures: economic contributions and economic values. An **economic contribution** addresses the business and financial activity resulting from the use of a resource. **Economic value**, on the other hand, is a non-business measure that estimates the value people receive from an activity after subtracting for their costs and expenditures. This concept, also known as consumer surplus, is not considered in this report.

There are three types of economic contributions: direct, indirect, and induced. A **direct contribution** is defined as the economic contribution of the initial purchase made by the consumer (the original retail sale). **Indirect contributions** are the secondary effects generated from a direct contribution, such as the retailer buying additional inventory, and the wholesaler and manufacturers buying additional materials. Indirect contributions affect not only the industry being studied, but also the industries that supply the first industry. An **induced contribution** results from the salaries and wages paid by the directly and indirectly effected industries. The employees of these industries spend their income on various goods and services. These expenditures are induced contributions, which, in turn, create a continual cycle of indirect and induced effects.

The direct, indirect, and induced contribution effects sum together to provide the overall economic contribution of the activity under study. As the original retail purchase (direct contribution) goes through round after round of indirect and induced effects, the economic contribution of the original purchase is multiplied, benefiting many industries and individuals. Likewise, the reverse is true. If a particular item or industry is removed from the economy, the economic loss is greater than the original lost retail sale. Once the original retail purchase is made, each successive round of spending is smaller than the previous round. When the economic benefits are no longer measurable, the economic examination ends. All estimates in this report include the direct, indirect and induced effects.

This study presents several important measures:

Expenditures – these include expenditures made by hunters and viewers for equipment, travel expenses and services related to their outdoor activities over the course of the year. These combined initial retail sales represent the "direct output".

Total Multiplier Effect – also known as "total output" or "total economic effect," this measure reports the sum of the direct, indirect, and induced contributions resulting from the original retail sale. This figure explains the total activity in the economy generated by a retail sale. Another way to look at this figure is, if the activity in question were to disappear and participants did not spend their money elsewhere, the economy would contract by this amount.

Salaries & Wages – this figure reports the total salaries and wages paid in all sectors of the economy as a result of the activity under study. These are not just the paychecks of those employees directly

serving recreationists or manufacturing their goods, it also includes portions of the paychecks of, for example, the truck driver who delivers food to the restaurants serving recreationists and the accountants who manage the books for companies down the supply chain, etc. This figure is based on the direct, indirect, and induced effects, and is essentially a portion of the total economic effect figure reported in this study.

Jobs – much like Salaries and Wages, this figure reports the total full and part-time jobs in all sectors of the economy as a result of the activity under study. These are not just the employees directly serving recreationists or manufacturing their goods, they also include, for example, the truck driver who delivers food to the restaurants serving recreationists and the accountants who manage the books for companies down the supply chain, etc. This figure is based on direct, indirect, and induced effects.

Contribution to Gross Domestic Product (GDP) - This represents the total "value added" made by the industries involved in the production of outdoor recreation goods and services. For a given industry, value added equals the difference between gross output (sales and other income) and intermediate inputs (goods and services imported or purchased from other industries).

Local, state, and federal taxes - These figures report the total revenues earned by each level of government as a result of the economic activity originally stimulated by visitors' spending. These include more than the taxes paid directly by recreators, but also includes the various taxes generated as dollars cycle through the state economy.

Appendix B. Methodology for Estimating Economic Contribution

The extent of the economic contributions associated with spending can be estimated in two ways:

- **Direct effects**: These include the jobs, income and tax revenues that are tied directly to the spending by recreationists without including multiplier effects.

- **Total effects**: These include the jobs, income and tax revenues that are tied directly to the spending by recreationists plus the jobs, income and tax revenues that result from the multiplier effects of recreational spending. The multiplier effect occurs when a direct purchase from a business leads to increased demand for goods and services from other businesses along their supply chain, known as the indirect effect. Also included is economic activity associated with household spending of incomes earned in the affected businesses, known as the induced effect.

The economic contributions, both direct effects and total effects, were estimated with an IMPLAN input-output model for the U.S. economy. The IMPLAN model was developed by MIG, Inc. originally for use by the U.S. Forest Service. Inherent in each IMPLAN model is the relationship between the economic output of each industry (i.e., sales) and the jobs, income and taxes associated with a given level of output. Through those models, it is possible to determine the jobs, income and taxes supported directly by wildlife-based recreationists with and without the multiplier effects.

Input-output models describe how sales in one industry affect other industries. For example, once a consumer makes a purchase, the retailer buys more merchandise from wholesalers, who buy more from manufacturers, who, in turn, purchase new inputs and supplies. In addition, the salaries and wages paid by these businesses stimulate more benefits. Simply, the first purchase creates numerous rounds of purchasing. Input-output analysis tracks the flow of dollars from the consumer through all the businesses that are affected, either directly or indirectly.

To apply the IMPLAN model, each specific expenditure for producer activities was matched to the appropriate industry sector affected by the initial purchase. The spending was estimated with models of the U.S. economy, therefore all the resulting contributions represent salaries and wages, total economic effects, jobs and tax revenues that occur within the U.S.

Estimating Tax Revenues

The IMPLAN model estimates detailed tax revenues at the state and local level and at the federal level. The summary estimates provided in this report represent the total taxes estimated by the IMPLAN model including all income, sales, property and other taxes and fees that accrue to the various local, state, and federal taxing authorities.