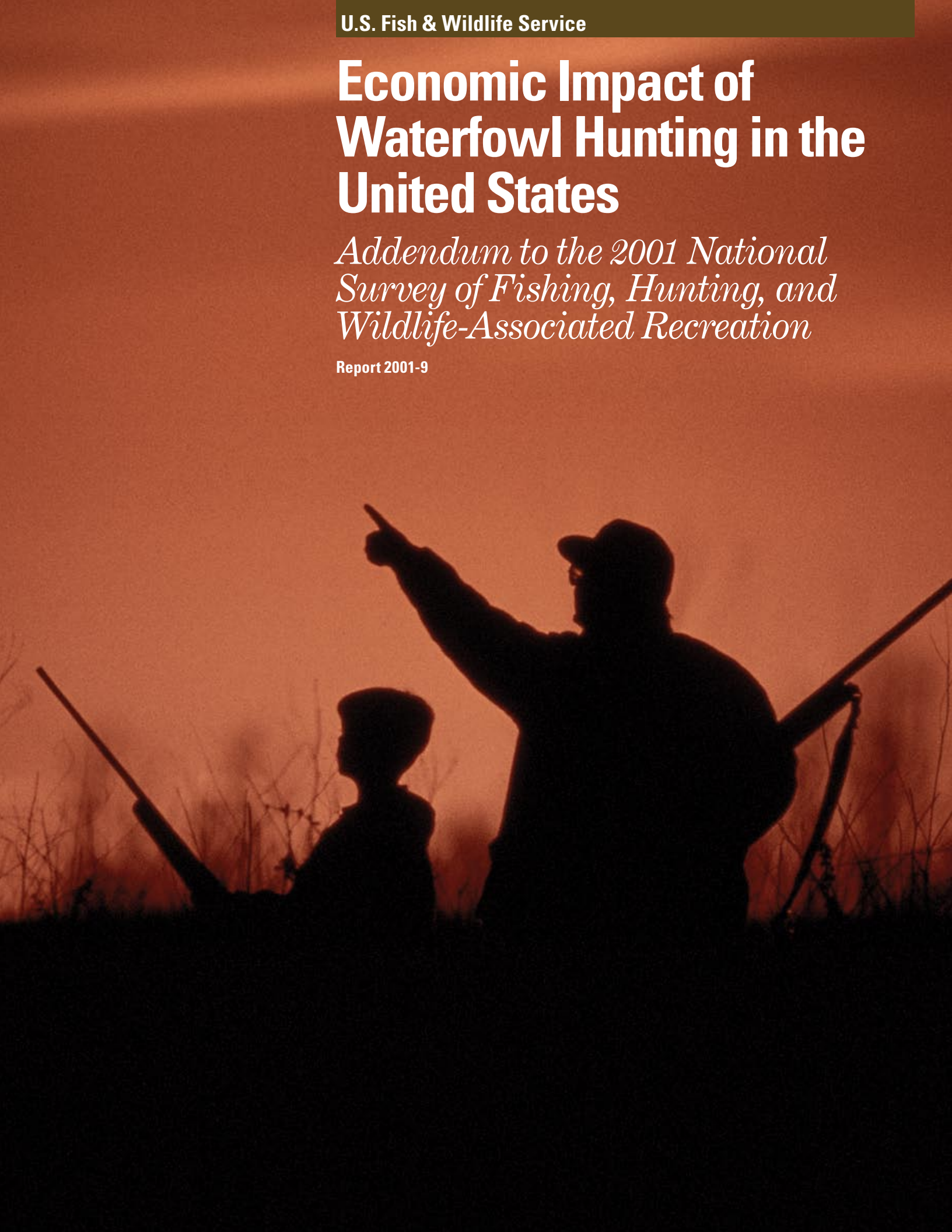


Economic Impact of Waterfowl Hunting in the United States

*Addendum to the 2001 National
Survey of Fishing, Hunting, and
Wildlife-Associated Recreation*

Report 2001-9



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July 2005

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This report is intended to complement the National and State reports from the 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. The conclusions are the authors and do not represent official positions of the U.S. Fish and Wildlife Service.

The author thanks Sylvia Cabrera, Richard Aiken, Jim Caudill, and Jerry Leonard for their input into this report.

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Introduction

Every year millions of sportspeople take to the field to hunt. Among them are waterfowl hunters who pursue ducks and geese in the nation's flyways. Waterfowl hunters are having an increasing economic impact on local, state, and national economies, more so than the average hunter. Since 1991, the number of duck hunters has increased by 37 percent and the number of goose hunters by 13 percent (Aiken 2004). During this same time period, the number of duck hunting days increased by 108 percent and the number of goose hunting days increased by 60 percent¹ (Aiken 2004). In 2001, waterfowl hunters represented 14 percent of all hunters, 9 percent of all hunting trip-related expenditures, and 10 percent of all hunting equipment expenditures.

This report provides information on these hunters, including their participation, demographic characteristics, and the economic impact of their expenditures. The first section examines the demographic characteristics of waterfowl hunters. The second section examines the economic impact of waterfowl hunting on state and national economies. Due to small sample sizes, some state-level impacts are not presented. All dollar estimates are presented as 2001 dollars.



All data are from the *2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation* and represent participation and expenditures for the 2001 calendar year by U.S. residents 16 years of age and older. The 2001 survey was conducted for the U.S. Fish and Wildlife Service by the U.S. Census Bureau. The survey was conducted in two phases. First, the screening interview identified wildlife-related recreationists; second, multiple interviews collected detailed information on participation and expenditures for persons 16 years of age and older. The U.S. Census Bureau collected the data primarily by telephone; respondents who could not be reached by telephone were interviewed in person. The response rate was 75 percent for the screen phase and 88 percent for the detailed sportsmen phase. For more detailed information on the methods of data collection, refer to the *2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*.²

¹ In the early 1990s, drought caused bird populations to plummet. In response, the U.S. Fish and Wildlife Service changed regulations to shorten hunting seasons and reduce the number of birds a hunter could take. These restrictions, along with a likely reduction in the probability of making kills due to a lower bird population, drove away many hunters. When the drought ended in the mid-nineties and regulations were relaxed, hunters returned. Thus, some of the substantial increase in hunters and days is attributable to the variable regulations during these years.

² This document is available on the U.S. Fish and Wildlife Service webpage: <http://federalaid.fws.gov/surveys/surveys.html>.

Waterfowl Hunters

Table 1 highlights the total number of waterfowl hunters, days, and trip-related and equipment-related expenditures.³ In 2001, approximately 1.8 million people participated in waterfowl hunting. While some hunters hunt both ducks and geese, over two-thirds of waterfowl hunters at least hunt ducks. Waterfowl hunters spent \$495 million on trip expenditures and \$440 million on equipment expenditures in 2001. Of trip expenditures, 42 percent was spent for food and lodging, 37 percent was spent on transportation, and 21 percent was spent on other costs such as guide fees and land use fees.

³ The Survey does not have an expenditure category for waterfowl hunters. Therefore, expenditures are prorated by multiplying migratory bird expenditures by a ratio to derive waterfowl expenditures. This ratio is (number of days hunting geese and ducks)/(total number of days hunting migratory birds). For separate duck and geese expenditures, the numerator included only duck hunting days or goose hunting days.

Table 1. Waterfowl Hunters, Days, and Expenditures: 2001
(Includes hunters 16 years of age and older. Numbers in thousands.)

Hunters, all waterfowl (1)	1,799
Duck	1,589
Geese	1,000
Days, all waterfowl	Not Available
Duck	18,290
Geese	10,508
Total Waterfowl Expenditures	\$934,803
Trip Expenditures (2)	\$494,988
Food and Lodging	\$205,508
Transportation	\$183,656
Other Trip Costs	\$105,825
Equipment Expenditures (3)	\$439,815

(1) The number of duck hunters and goose hunters does not sum to the total number of waterfowl hunters because of multiple responses.

(2) Trip expenditures include food, drink, lodging, public and private transportation, guide fees, pack trip or package fees, public and private land use access fees, equipment rental, boating costs, and heating and cooking fuel.

(3) Equipment expenditures consist of rifles, shotguns, other firearms, ammunition, telescopic sights, decoys, hunting dogs and associated costs. Also included are auxiliary equipment such as camping equipment, binoculars, special hunting clothing, processing and taxidermy costs. Due to small sample sizes, special equipment purchases such as boats, campers, trucks, and cabins are excluded from equipment expenditures.



Demographics

This section illustrates the demographic characteristics for waterfowl hunters. In addition, demographic characteristics are presented for all hunters to depict the differences and similarities with the waterfowl hunter subset.

Figures 1 and 2 show where hunters live by region and flyway. By region, the majority of waterfowl hunters live in the South (36 percent) and the Midwest (34 percent). While 20 percent of waterfowl hunters live in the West, only 10 percent live in the Northeast.

The continental United States is divided into four flyways: Atlantic, Central, Mississippi, and Pacific. These flyways represent major migration routes for migratory birds. Figure 2 shows that the majority of waterfowl hunters live in the Mississippi flyway (44 percent). Less than 1 percent of waterfowl hunters did not live in a designated flyway in the continental United States, but lived instead in Hawaii or Alaska.

Figure 1. Distribution of Waterfowl Hunters by Region
(Population 16 years of age and older)

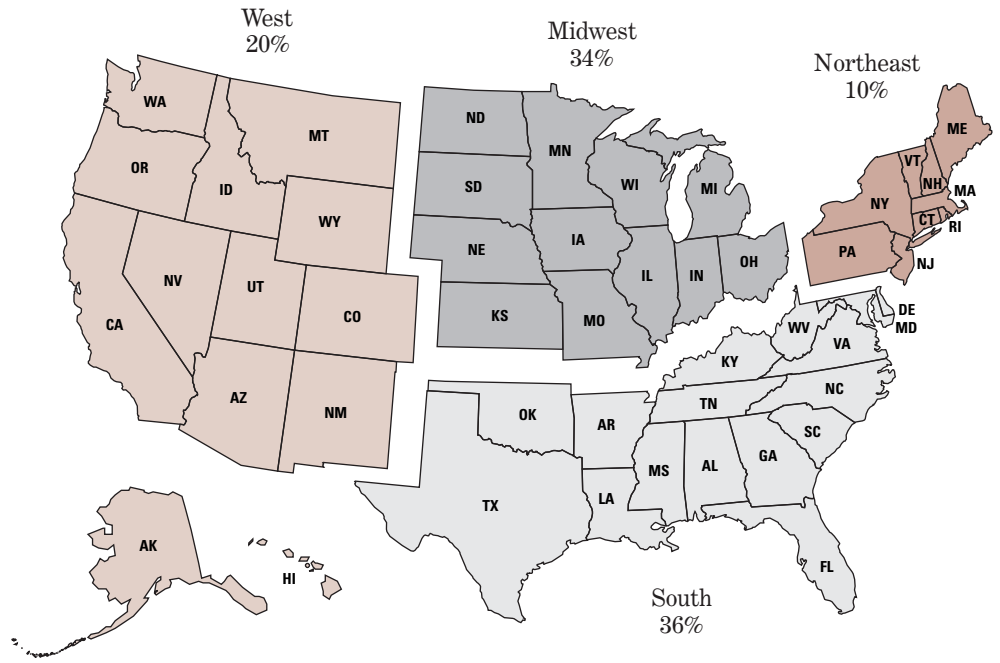
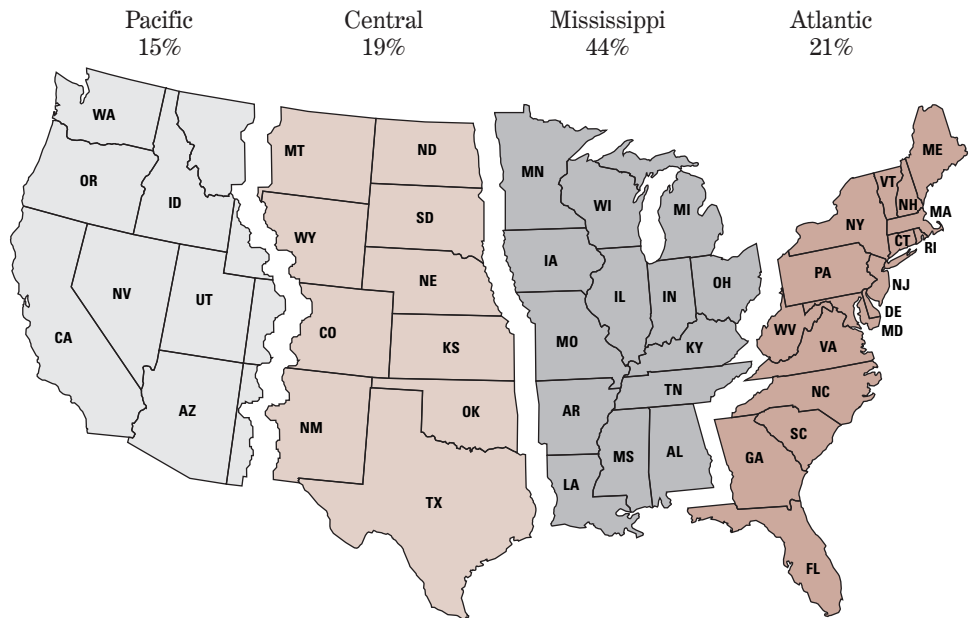


Figure 2. Distribution of Waterfowl Hunters by Flyway
(1.8 million total waterfowl hunters)



For waterfowl hunters, participation increases with age until the 35-44 age category (29 percent), after which, waterfowl hunting decreases with age (Fig 3). This pattern is similar for all hunters as well. Fifty-three percent of all waterfowl hunters are 25 to 44 years old.

Figure 4 depicts the association between waterfowl hunting and educational attainment. The number of waterfowl hunters increases with educational achievement. Only 202,000 waterfowl hunters (11 percent) have not obtained their high school degrees. Unlike waterfowl hunters, the percentage of all hunters does not increase with educational attainment. Instead, the percentage of all hunters decreases after attaining a high school diploma.

Figure 5 shows that waterfowl hunting is positively correlated with income. That is, as household income increases, the percentage of waterfowl hunters in each income group also increases. Income is also positively correlated with the participation level of all hunters. However, all hunters do not tend to be as affluent as waterfowl hunters. Waterfowl hunters with an annual household income of over \$50,000 are 67 percent (1.0 million hunters) compared with 51 percent for all hunters (5.7 million hunters).

Figure 3. Percent of Hunters by Age

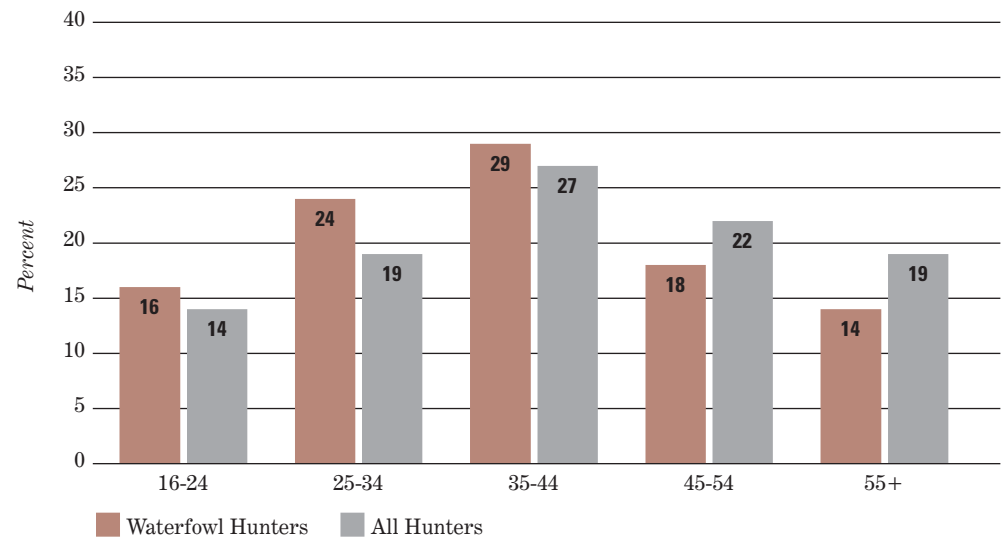


Figure 4. Percent of Hunters by Education

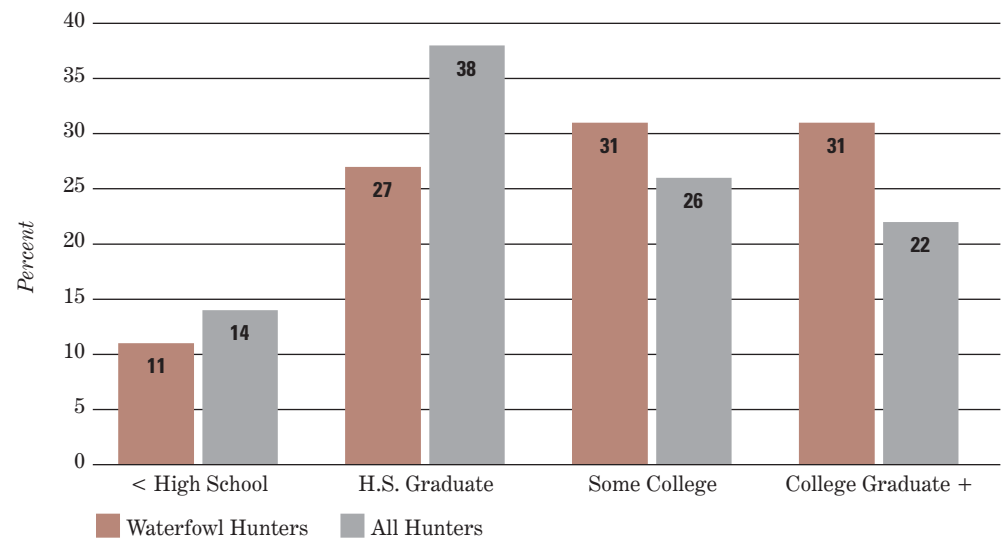
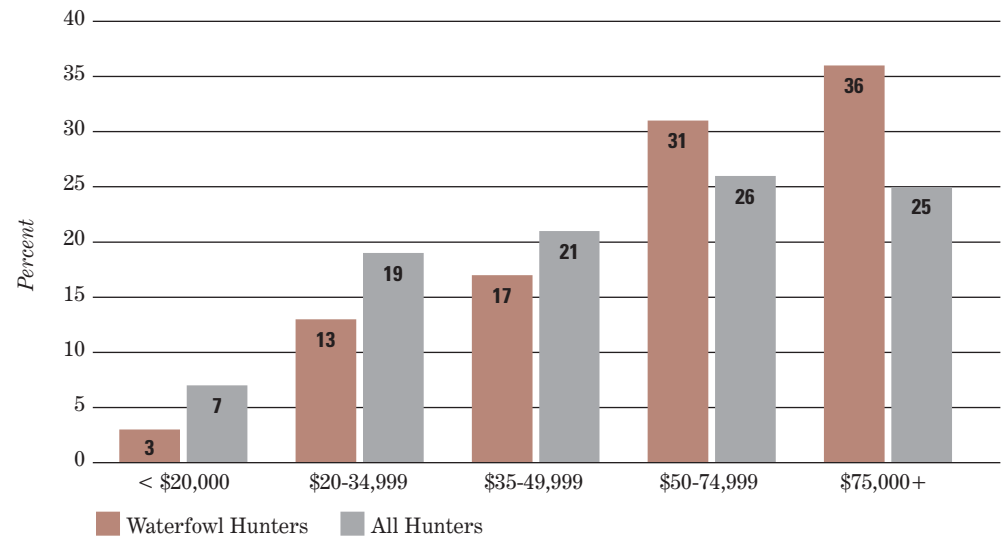


Figure 5. Percent of Hunters by Annual Household Income



Figures 6 and 7 compare hunting participation by residents of metropolitan statistical areas (MSA) with that of individuals living outside those areas. A MSA is a heavily populated area comprising a central city or urban core of 50,000 or more people and its surrounding counties or communities, as identified by the U.S. Census Bureau. A vast majority of the U.S. population lives in these areas. It is not surprising that a majority of hunters do also.

In 2001, 81 percent of the U.S. population 16 years of age and older, 59 percent of all hunters, and 67 percent of waterfowl hunters lived in MSAs (Figure 6). In contrast, only 19 percent of the U.S. population lived outside MSAs compared with 41 percent of all hunters and 33 percent of waterfowl hunters.

It is not difficult to see that hunters are less urban than the population as a whole, and that a nonmetropolitan resident has a higher percentage chance of being a hunter than does a metropolitan resident. In 2001, 13 percent of all *nonmetropolitan* residents hunted and 2 percent waterfowl hunted. While, only 5 percent of all *metropolitan* residents hunted and 1 percent waterfowl hunted (Figure 7).

Figure 6. Percent of Hunters by Residence

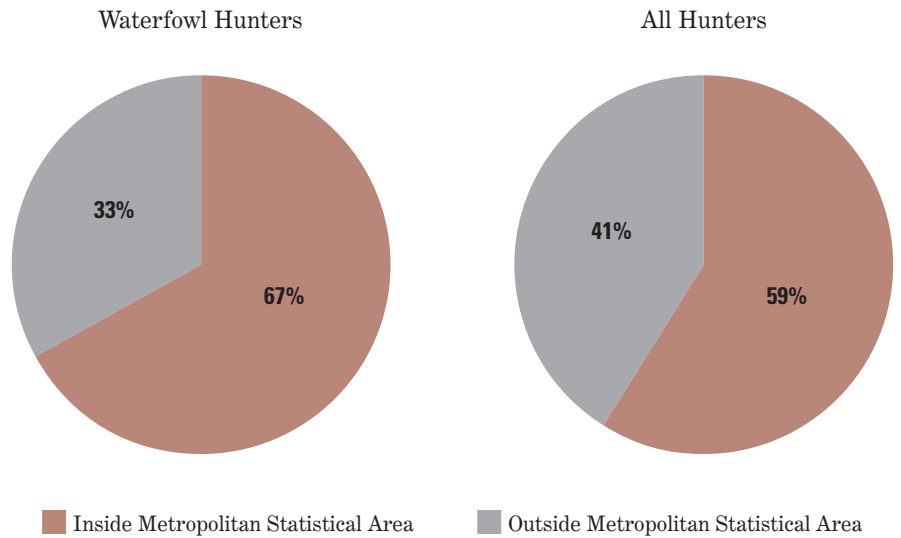
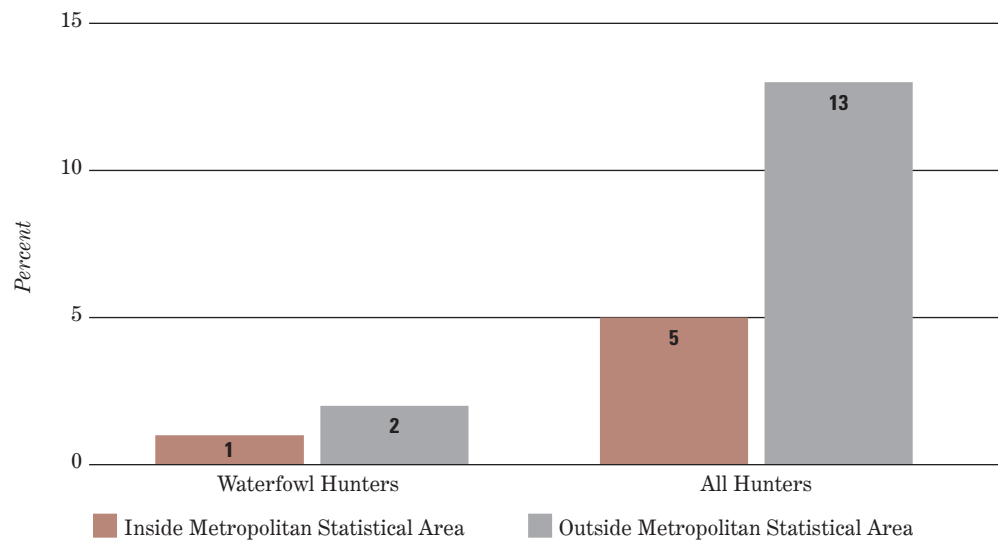


Figure 7. Percent of U.S. Population Who Hunted by Residence



Avidity and Expenditures

Figure 8 depicts the mean days of waterfowl hunting nationwide. Waterfowl hunters who hunt both ducks and geese average over twice as many days (26 days) as waterfowl hunters who do not hunt both. On average, duck hunters spend more days hunting (12 days) than goose hunters (11 days). All hunters average about 18 days per year, which is similar to the estimate for all waterfowl hunters (16 days).

In addition to hunting one more day on average, duck hunters also tend to spend more than goose hunters annually (Figure 9). However, waterfowl hunters who hunt both ducks and geese spend nearly twice as much (\$751) as duck hunters or goose hunters. All hunters tend to spend more (\$845) than waterfowl hunters.

Table 2 shows the number of people who participated in waterfowl hunting and the number of waterfowl hunting days by state in 2001. The 3 States with the most waterfowl hunters were Minnesota (179,000 hunters), Arkansas (157,000 hunters), and Louisiana (129,000 hunters). All three of these States are within the Mississippi flyway, which was the flyway with the most waterfowl hunters (Fig 2).

Figure 8. Average Annual Days of Hunting

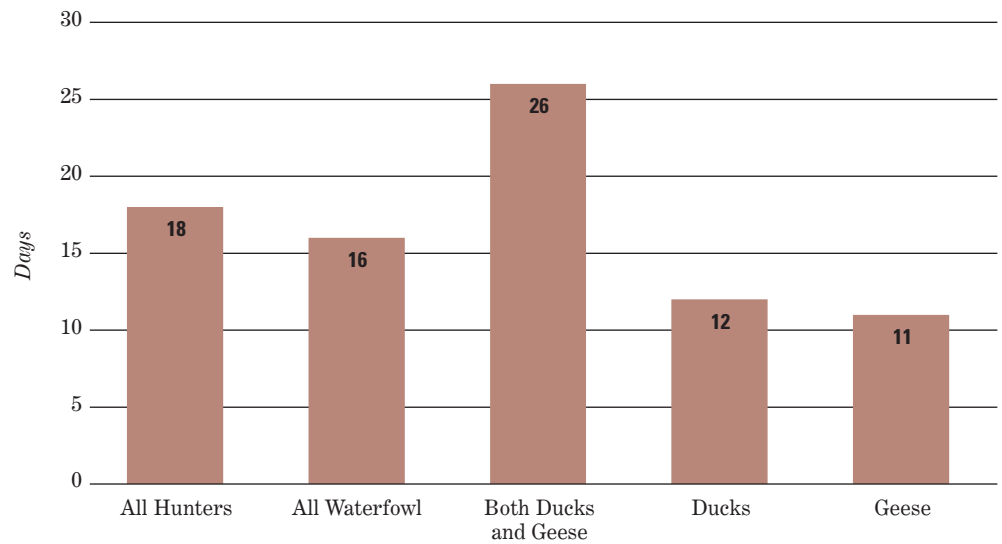


Figure 9. Average Annual Expenditures

(Including Trip-related and Equipment-related Expenditures)

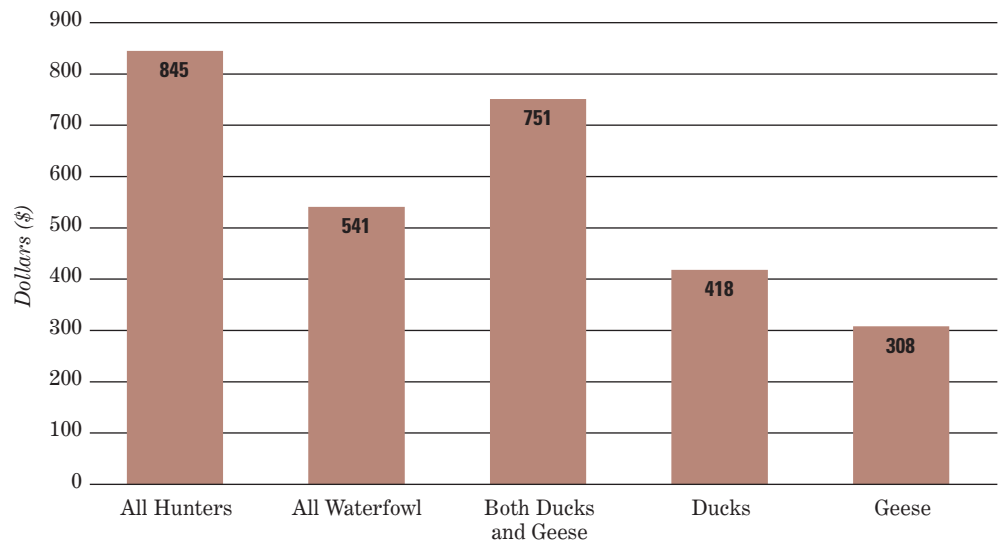


Table 2. Number of Waterfowl Hunters and Hunting Days: 2001

(Population 16 years of age and older. Numbers in thousands.)

State	Number of Hunters			Number of Days		
	Waterfowl	Ducks	Geese	Waterfowl	Ducks	Geese
Alabama	27	27	–	N.A.	153	–
Arkansas	157	154	34	N.A.	1,741	216
California	102	97	76	N.A.	1,524	1,288
Colorado	48	33	41	N.A.	309	392
Delaware	7	–	–	N.A.	–	–
Idaho	31	28	26	N.A.	204	144
Illinois	44	39	–	N.A.	742	–
Iowa	48	45	25	N.A.	521	359
Kansas	38	26	28	N.A.	323	228
Kentucky	25	23	–	N.A.	135	–
Louisiana	129	127	–	N.A.	1,021	–
Maryland	43	33	36	N.A.	186	185
Minnesota	179	165	120	N.A.	1,337	1,054
Mississippi	42	39	–	N.A.	237	–
Missouri	41	35	27	N.A.	577	464
Montana	19	16	17	N.A.	134	114
Nebraska	38	33	30	N.A.	265	297
Nevada	14	13	–	N.A.	92	–
New Mexico	16	15	–	N.A.	132	–
New York	82	55	50	N.A.	913	810
North Carolina	51	48	–	N.A.	673	–
North Dakota	57	49	39	N.A.	334	290
Ohio	58	43	518	N.A.	425	413
Oklahoma	32	32	–	N.A.	720	–
Oregon	32	29	–	N.A.	264	–
South Carolina	21	21	–	N.A.	164	–
South Dakota	44	34	38	N.A.	335	300
Tennessee	57	54	–	N.A.	522	–
Texas	94	90	–	N.A.	1,437	–
Utah	42	42	23	N.A.	410	249
Washington	48	42	32	N.A.	394	231
Wisconsin	52	46	46	N.A.	311	189
Wyoming	7	–	–	N.A.	–	–

Note: A hyphen (–) denotes sample sizes that are too small to report reliably (9 or less). States NOT listed have sample sizes too small to report reliably for any category (9 or less). State sample sizes are shown in Appendix A. Sample size criteria are consistent with the “2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.”

(N.A.) Not Available

The Economic Impacts of Waterfowl Hunting

Waterfowl hunters spend money on a variety of goods and services for trip-related purchases and equipment-related purchases. Trip expenditures include food, lodging, transportation, and other incidental expenses. Equipment expenditures consist of guns, decoys, hunting dogs, camping equipment, special hunting clothing, and other costs. By having ripple effects throughout the economy, these direct expenditures are only part of the economic impact of waterfowl hunting.

The effect on the economy in excess of direct expenditures is known as the multiplier effect. For example, an individual may purchase decoys to use while duck hunting. Part of the purchase price will stay with the local retailer. The local retailer, in turn, pays a wholesaler who in turn pays the manufacturer of the decoys. The manufacturer then spends a portion of this income to pay businesses supplying the manufacturer. In this sense, each dollar of local retail expenditures can affect a variety of businesses.

Thus, expenditures associated with waterfowl hunting can ripple through the economy by impacting economic activity, employment, and household income. To measure these effects, a regional input-output modeling method⁴ is utilized to derive estimates for total industry output, employment, employment income, and tax revenue associated with waterfowl hunting.

⁴ The estimates for total industry output, employment, employment income, and federal and state taxes were derived using IMPLAN, a regional input-output model and software system.

Total Industry Output

Table 3 depicts the economic effect of expenditures by waterfowl hunters in 2001. Their trip and equipment expenditures totaling \$934.8 million, as shown in Table 1, generated \$2.3 billion in total output in the United States. Total output includes the direct, indirect, and induced effects of the expenditures associated with waterfowl hunting.

Direct effects are the initial effects or impacts of spending money; for example, purchasing ammunition or a pair of binoculars are examples of direct effects. An example of an indirect effect would be the purchase of the ammunition by a sporting goods retailer from the manufacturer.

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 sporting goods retailer, by the wholesaler, and by the ammunition manufacturer spend their income on various goods and services which in turn generate a given level of output (induced effects).

Employment and Employment Income

Table 3 shows that waterfowl hunting expenditures in 2001 created 21,415 jobs and \$725.2 million in employment income. Thus, each job had an average annual salary of \$33,860. Jobs and job income in Table 3 include direct, indirect, and induced effects in a manner similar to total industrial output. Jobs include both full and part-time jobs, with a job defined as one person working for at least part of the calendar year. Job income consists of both employee compensation and proprietor income.

Federal and State Taxes

Federal and State tax revenues are derived from waterfowl hunting related recreational spending. In 2001, over \$129.5 million in State tax revenue and \$201.8 million in Federal tax revenue were generated.

Table 3. Summary of Economic Impacts: 2001

(Dollar values are in thousands.)

Waterfowl Hunters	1,799,000
Total Expenditures	\$934,803
Total Industry Output	\$2,326,691
Employment	21,415
Employment Income	\$725,162
State Tax Revenue	\$129,484
Federal Tax Revenue	\$201,826

State Impacts

The economic impact of a given level of expenditures depends, in part, on the degree of self-sufficiency of the area under consideration. An area with a high degree of self-sufficiency (out-of-area imports are comparatively small) will generally have a higher level of impacts associated with a given level of expenditures than an area with significantly higher imports (a comparatively lower level of self-sufficiency). Thus, 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. The impacts in each State are only those impacts that occur within the State, and a State's multiplier is typically smaller than the multiplier for the United States.

Table 4 shows the economic impacts of trip-related and equipment-related waterfowl hunting expenditures by state in 2001. Texas, California, and Arkansas generated the largest amount of total output at \$206.0 million, \$143.7 million, and \$133.6 million, respectively. Due to small sample sizes, the economic impacts are not depicted for all States.

Table 4. Economic Impact of Waterfowl Hunting—State and National Totals: 2001

(Dollar values are in thousands.)

<i>State</i>	<i>Trip and Equipment Expenditures</i>	<i>Total Output</i>	<i>Job Income</i>	<i>Jobs</i>	<i>State Tax Revenue</i>	<i>Federal Tax Revenue</i>
United States	\$934,803	\$2,326,691	\$725,162	21,415	\$129,484	\$201,826
Alabama	\$14,064	\$21,127	\$5,817	202	\$997	\$1,593
Arkansas	\$96,344	\$133,567	\$27,909	1,557	\$6,887	\$8,991
California	\$86,487	\$143,669	\$44,957	1,303	\$8,430	\$12,501
Colorado	\$20,205	\$32,739	\$9,663	319	\$1,704	\$2,798
Delaware	\$1,972	\$1,402	\$692	27	\$125	\$195
Idaho	\$9,126	\$12,793	\$3,244	154	\$665	\$822
Illinois	\$50,608	\$84,160	\$23,642	694	\$4,587	\$2,466
Iowa	\$16,840	\$24,588	\$7,239	282	\$1,375	\$1,943
Kansas	\$12,759	\$14,818	\$5,732	209	\$1,092	\$1,583
Louisiana	\$68,488	\$105,483	\$30,260	1,184	\$5,302	\$7,369
Maryland	\$10,172	\$15,595	\$5,907	149	\$1,119	\$1,617
Minnesota	\$82,767	\$132,501	\$41,243	1,403	\$8,140	\$11,581
Mississippi	\$6,837	\$9,752	\$2,744	97	\$514	\$710
Missouri	\$19,691	\$31,553	\$9,568	338	\$1,701	\$2,552
Montana	\$4,189	\$5,935	\$1,502	72	\$296	\$415
Nebraska	\$21,933	\$32,874	\$9,481	337	\$1,678	\$2,437
Nevada	\$18,515	\$26,143	\$7,535	227	\$1,119	\$2,209
New Mexico	\$7,764	\$12,428	\$3,622	127	\$702	\$907
New York	\$12,742	\$19,915	\$6,372	176	\$1,328	\$1,762
North Carolina	\$22,320	\$34,931	\$9,236	350	\$1,663	\$2,622
North Dakota	\$12,028	\$17,552	\$4,458	236	\$851	\$1,172
Ohio	\$12,641	\$18,409	\$5,566	198	\$1,007	\$1,431
Oklahoma	\$10,246	\$16,292	\$4,707	184	\$912	\$1,231
Oregon	\$23,478	\$38,664	\$11,122	391	\$2,002	\$3,070
South Carolina	\$9,811	\$14,346	\$4,002	127	\$729	\$1,089
South Dakota	\$17,085	\$24,267	\$3,289	332	\$1,154	\$1,817
Tennessee	\$40,889	\$64,791	\$19,366	573	\$3,074	\$5,253
Texas	\$121,115	\$206,037	\$62,870	1,877	\$9,785	\$17,762
Utah	\$13,261	\$21,219	\$6,276	240	\$1,185	\$1,616
Washington	\$38,714	\$57,734	\$17,063	560	\$2,976	\$4,893
Wisconsin	\$9,103	\$13,777	\$3,892	147	\$789	\$1,047
Wyoming	\$1,682	\$2,574	\$561	35	\$96	\$164

Note: States NOT listed have sample sizes too small to report reliably (9 or less). State sample sizes are shown in Appendix A. These sample size criteria are consistent with the "2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation."

Summary

This report has presented information on the participation and expenditure patterns of approximately 1.8 million waterfowl hunters. Compared to all hunters, waterfowl hunters tend to be younger, have more years of education, and are more affluent. The majority (70 percent) of waterfowl hunters live in the South and Midwest regions of the United States.

Trip-related and equipment-related expenditures associated with waterfowl hunting generated over \$2.3 billion in total economic output in 2001. This impact was dispersed across local, state, and national economies.



Appendix A—Sample Sizes

<i>State</i>	<i>Waterfowl Hunters</i>	<i>Waterfowl Days</i>	<i>Trip Expenditures</i>
Alabama	15	14	11
Arizona	8	8	7
Arkansas	57	57	52
California	16	15	12
Colorado	22	22	22
Connecticut	1	1	0
Delaware	13	13	11
Florida	7	7	3
Georgia	8	7	5
Idaho	21	21	19
Illinois	12	12	11
Indiana	5	5	1
Iowa	24	24	24
Kansas	31	31	27
Kentucky	11	11	6
Louisiana	51	49	43
Maine	7	7	6
Maryland	21	21	18
Massachusetts	9	8	6
Michigan	9	9	7
Minnesota	42	42	30
Mississippi	20	20	18
Missouri	16	16	13
Montana	19	19	17
Nebraska	45	45	41
Nevada	16	16	15
New Hampshire	7	7	3
New Jersey	1	1	1
New Mexico	13	13	12
New York	17	17	13
North Carolina	15	15	10
North Dakota	71	71	64
Ohio	14	14	13
Oklahoma	12	12	11
Oregon	20	20	18
Pennsylvania	9	9	6
Rhode Island	3	3	2
South Carolina	13	13	11
South Dakota	60	60	54
Tennessee	19	19	18
Texas	16	16	13
Utah	42	42	38
Vermont	2	2	2
Virginia	5	5	5
Washington	26	26	22
West Virginia	3	3	1
Wisconsin	16	15	15
Wyoming	11	11	9

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July 2005

