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Theodore Roosevelt Conservation Alliance Presents:

The Economic Impacts of Fishing, Hunting and Wildlife Viewing on National Forest Lands

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WELCOME

You obviously care about the future of our national forest system and the American economy or you wouldn't be reading this valuable research that shows the collective size and strength of hunters and anglers.

The Theodore Roosevelt Conservation Alliance (TRCA) is dedicated to helping grassroots sporting groups and their constituents be heard where the decisions are made our national forests and grasslands. Picture the lone raindrop falling to the forest floor, pooling into a trickle that reaches the stream that adds strength to the raging river and becomes the thundering waterfall.

Our collective voices have that same power!

Our Trustees: Izaak Walton League of America, Mule Deer Foundation, Rocky Mountain Elk Foundation, Trout Unlimited, Wildlife Forever and The Wildlife Management Institute invite you to stand up and be counted. Let your voice be heard by joining us if you want to nurture, enhance and protect our fish, wildlife and habitat resources on our national forest system.

With pride, TRCA highlights the conservation legacy of American leaders, elected officials and citizen volunteers whose foresight gave us our public lands that are home to most of the country's elk, mule deer and other species.

It is that same foresight which guided the American Sportfishing Association and US Forest Service to quantify the economic impact of recreational fishing and hunting on our national forests. We want to thank them for their hard work and insights. They deserve the credit for the original project.

If you would like additional copies of this reprint free from TRCA to share with others, please call us toll-free at 1-877-770-8722 or view it on-line at www.trca.org.

Remember, you and I are forebearers to future generations of Americans who will judge us by our stewardship of these critical watersheds and public resources.

Wishing you the best afield,

Bob Munson

Bob Munson
Director

Special thanks to the critical funding of the Pew Charitable Trusts.

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EXECUTIVE SUMMARY

In this project, the economic contributions of fishing, hunting, and wildlife-viewing activities that occur on National Forest lands are quantified. Data on expenditures and participation came from the 1996 National Survey of Fishing, Hunting, and Wildlife Associated Recreation (U.S. Department of the Interior, 1997). Input/Output models were developed to provide economic impact estimates on a statewide and regional basis. These results are intended to help managers plan resource activities and increase public awareness of fishing, hunting, and viewing use opportunities on National Forest lands.

Wildlife related recreation (fishing, wildlife viewing, and hunting) on National Forest lands provides significant benefits to state and regional economies throughout the nation. In 1996, wildlife related recreation on Forest Service lands contributed about $21 billion to the nations economy. This economic activity supported 238,800 full time equivalent (FTE) jobs, and generated $421 million in state sales and income taxes. Within the National Forest System fishing generated the largest economic impact, followed by hunting and wildlife viewing.

In 1996, fishing within the National Forest System generated $2.9 billion in retail sales, $8.5 billion in total multiplier effects, $2.2 billion in salaries and wages, and 95,720 (FTE) jobs annually. Fishing on National Forest lands also provided $128.2 million in state sales tax revenues, $33.5 million in state income tax revenues, and $241.6 million in federal income tax revenues. Nonconsumptive wildlife-related activities on National Forest lands generated $2.1 billion in retail sales, $6.3 billion in total multiplier effects, $1.6 billion in salaries and wages, 70,372 (FTE) jobs, $98.8 million in state sales tax revenues, $22.5 million in state income tax revenues, and $177.6 million in federal income tax revenues.

The results show that hunting on National Forest lands generated $2.1 billion in retail sales, $6.1 billion in total multiplier effects, $1.69 billion in salaries and wages, and 72,719 (FTE) jobs annually for the U.S. economy in 1996. Hunting also provided tax revenues by generating $105.7 million in state sales tax and $32.6 million in state income tax revenues, and $181.7 million in federal income tax revenues.

Economic impacts were calculated separately for big game, small game, and migratory bird hunting on Forest Service lands. Big game hunting was extremely popular, and in 1996 hunters spent 16.2 million days targeting big game species within the National Forest System, spending a total of $1.26 billion on their trips. These expenditures generated, $3.6 billion in total output, $996 million in salaries and wages, and supported 42,225 full time equivalent jobs annually for the U.S. economy. Big game hunting also provided tax revenues by generating $65.2 million in state sales tax and $21.1 million in state income tax revenues, and $107.9 million in federal income tax revenues.

On National Forest lands small game hunting and migratory bird hunting were less popular than big game hunting. In 1996, these activities generated $227.8 million and $243.3 million in retail sales respectively. Economic activity associated with small game hunting amounted to $663 million that supported 8,102 jobs (FTE), generated $19.6 million in state sales and income taxes, and $19 million in federal income taxes. Economic activity associated with migratory bird hunting amounted to $714 million that supported 8,801 jobs (FTE), generated $19.2 million in state sales and income taxes, and $21.0 million in federal income taxes.

From these results it is evident that outdoor recreation benefits a variety of industries, and contributes millions of dollars annually to state and federal coffers. By recognizing the huge economic contributions of fish and wildlife-related activities that take place on National Forest lands, and using these data to help manage all forest resources wisely, the local communities and the national economy will realize long term sustained benefits.

The National Forest System provides high quality wildlife recreational opportunities throughout the nation. In addition, hunting, fishing and other wildlife-related activities on National Forest lands provide the U.S. and state economies with important sources of jobs, income and other benefits.

This study did not measure economic impact to local economies in close proximity to National Forest lands. However, benefits from wildlife related recreational activities are particularly important in rural or remote areas, where other sources of income are limited. By supporting billions in retail sales, tens of thousands of jobs and billions in salaries and wages, fishing, hunting and other wildlife-related activities are of great value not only to industry and local businesses, but to every resident of every community surrounding National Forest Service lands.

Apart from providing business and job opportunities, outdoor recreation contributes other benefits to our society. The American Recreation Coalition reported that Americans who participate in outdoor recreation during childhood and adulthood have an overall higher quality of life than others (ARC, 1996). In addition to contributing recreational activities, national forests provide aesthetically pleasing surroundings prized by millions of Americans who want to live and work in a rural setting.

INTRODUCTION

Fishing, hunting and wildlife-watching are popular and traditional pastimes, which result in significant economic impacts to the nation. It was determined that 77 million adult Americans (16 years old and older) participated in these activities during 1996 (U.S. Department of Interior, 1997). This means that 38% of the adult U.S. population in 1996 took recreational trips for the primary purpose of fishing, hunting and wildlife-watching. Expenditures associated with wildlife related recreation totaled $101 billion in 1996. These figures represent participation and expenditures throughout the nation on private and public lands.

For the nation's 77 million people who, fish, hunt, and view wildlife, managing national forests for recreational use is extremely important, since the Forest Service oversees 30% of all federal lands, more private land owners are restricting access to their property, and outdoor recreation is growing by two points per year (ARC, 1996). Moreover, the tourism, recreational equipment and transportation sectors of our economy are dependent upon the provision of outdoor recreational opportunities on public lands. In this study, economic impacts from recreational fishing, hunting, and wildlife viewing are estimated for areas managed by the Forest Service. Local community impacts are not calculated in this study. Economic impacts are determined on a statewide basis and regional summaries are presented. Completion of this project accomplishes a primary task of the Forest Services Eyes on Wildlife Strategic Plan, Rise to the Future Fisheries Program Action Plan, and the Wildlife, Fish and Rare Plant Communication Strategic Plan.

Economic Concepts

The economic benefits of outdoor recreation can be estimated by two types of economic methods: economic impact analysis and economic valuation. An economic impact analysis addresses the business and financial activity resulting from users expenditures. Economic value measures the intrinsic value received by the user in the course of their outdoor activity. Technically, net economic value measures the difference between what an individual would be willing to pay and what they actually pay for a commodity or activity. This concept is also known as consumer surplus. Only economic impacts are addressed in this report.

There are three types of economic impacts: direct, indirect, and induced. A direct impact is created by the initial purchase made by the consumer. For example, when a person buys binoculars for $395 there is a direct impact to the retailer of $395. Indirect impacts are secondary effects generated from a direct impact. For example, the retail store must purchase additional binoculars; the binocular manufacturer must purchase additional glass and metals for production; glass manufacturers must buy inputs, and so on. Therefore, the original expenditure of $395 for the binoculars benefits a host of other industries. An induced impact results from the wages and salaries paid by the directly and indirectly impacted industries. The employees of these industries spend their income on various goods and services. These expenditures are known as induced impacts which, in turn, create a continual cycle of additional indirect and induced effects.

The sum of the direct, indirect and induced impacts equals the total economic impact. As the original retail purchase goes through round after round of indirect and induced effects, the economic impact 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.

METHODS

The methods used to estimate days of participation and economic impacts of wildlife-associated recreational activities on National Forest lands are separated into six stages:

- Extract days of participation and tabulate recreationists expenditures;
- Calculate participation and expenditures attributable to National Forest lands;
- Develop trends in participation and expenditures between 1991 and 1996 for all wildlife related activities;
- Disaggregate the expenditures into retail, wholesale, and manufacturer portions;
- Generate economic impact estimates by applying the economic model to the adjusted expenditures;
- Calculate state sales tax, state income tax, and federal income tax revenues;
- Calculate standard errors for 1996 regional participation and expenditure estimates.

Participation

Days of participation were obtained from the U. S. Fish and Wildlife Service's 1996 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (The National Survey). Anglers, hunters, and wildlife watchers were asked to report days of activity where the particular recreational activity was the primary purpose of their trip. In the case of hunting and wildlife viewing, the National Survey collects data specifically on participation on public lands. Initial 1996 participation estimates for all three activities on National Forest lands were submitted to Forest Service Regional offices for comment. If appropriate, recommendations made by Forest Service personnel were used to modify estimates.

Freshwater fishing days including Great Lakes fishing effort were downloaded for each state. For each state, a ratio was applied to this data in order to estimate the number of angler days on National Forest lands. Except for Alaska, this downweighting factor was the ratio of the surface area of water bodies on National Forest lands and the total surface area of all inland water bodies within the state (Appendix 1). In Alaska, most fishing takes place in the South Central and Southeast portions of the state (Howe et. al., 1996), and Forest Service lands are located in these areas in Alaska. Thus, the downweighting factor was the ratio of surface area of water bodies on National Forest lands in Alaska and surface area of inland water bodies in the entire Southeast and South Central portions of the state.

In the case of wildlife viewing, only nonresidential wildlife viewing days on public lands were downloaded. Nonresidential participation is defined as activity occurring at least 1 mile away from the respondents home. The National Survey does not specifically elicit data on public lands viewing days. Instead respondents were asked whether they viewed wildlife on private and or public lands in each state. A ratio was developed from these responses to calculate the total public wildlife viewing days:

- If the response was yes to public land and no to private land then all days in that state was assumed to be on public lands.
- If the response was yes to both public and private lands, then 50% of all days in that state was assumed to be on public lands.
- If the respondent was not sure if activity occurred on public or private land, then 50% of all days in that state was assumed to be on public lands.

The proportion of these public viewing days on Forest Service (FS) lands was estimated as the ratio of FS land acreage and total public land acreage (federal, state, and local) within the state (Appendix 2). It was assumed that wildlife viewing took place on all public lands. There was no reliable information on all public land acreage in Alaska, and since 70% of all land in Alaska is managed by federal agencies, the ratio used to downweight total public viewing days was calculated as the ratio of Forest Service acreage and total federal land acreage in Alaska (Bureau of Land Management, 1996).

Sportsmen responding to the National Survey were asked specifically to recall the number of days they spent hunting on public lands. Thus, it was possible to extract total hunting days, big game hunting days, small game hunting days, and migratory bird hunting days on public lands from the National Survey database. Again a ratio was applied to this data to estimate the level of public hunting on Forest Service lands on a statewide basis. The proportion of these public viewing days on Forest Service (FS) lands was estimated as the ratio of FS land acreage and total federal and state public land acreage within the state (Appendix 2). It was assumed that hunting would not occur on local and municipal public lands. This ratio was then adjusted by data obtained from each Forest Service regional office. Some regional offices provided hunting participation data that gave more insight into the proportion of public hunting on Forest Service lands:

1. Data from the Alaska office indicates that the total number of hunting days in South Central and South East Alaska was 499,118 in 1994, and the Forest Service days amounted to 135,208. Thus the ratio of 37.16% was used to weight the public lands hunting data (In Alaska 73% of all hunting takes place on public lands).

2. In Utah and Wyoming, independent surveys indicate that 67% of all public hunting days in the state took place on National Forest lands.

Participation data were extracted from the 1991 National Survey (U.S. Department of the Interior, 1993), and proportionally reduced to reflect participation on Forest Service lands. The same methods were used to derive participation estimates as described for the 1996 estimates. Estimation of 1991 participation and expenditure on National Forest lands was required to establish trends between 1991 and 1996. A previous study conducted for the Forest Service, The 1994 Economic Impacts of Fishing, Hunting, and Wildlife-Related Recreation on National Forest lands, utilized data from the 1991 National Survey. However, the methods used to estimate Forest Service participation and corresponding expenditures were not the same as utilized in this analysis.

Expenditures

The 1996 National Survey collects expenditure information where the primary purpose of the purchase was for hunting, inland (freshwater and Great Lakes) fishing, or non consumptive wildlife-related activities. For the purposes of this project, inland fishing, hunting and nonconsumptive wildlife-related recreation expenditure data were downloaded from the survey database separately for individual states. Also, hunting expenditures for big game, small game and migratory bird hunting were separately extracted from this data base.

For all activities, expenditures were extracted individually by expenditure item. Expenditures included trip-related (e.g. food, lodging, fuel), hunting equipment (e.g. guns, decoys, ammunition), fishing equipment (e.g. rods, reels, lures), wildlife viewing equipment (e.g. binoculars, photographic equipment), auxiliary equipment (e.g. camping equipment), special equipment (e.g. boats), and other purchases made for the specific recreational activity. A complete description of these expenditure categories for fishing, hunting, and wildlife viewing is contained in Appendix 3.

Fishing and hunting expenditures that would not be incurred for fishing or hunting on public lands were deleted as follows: private land use or access fees; cabins; and land leasing and ownership. Then for each state, expenditure estimates were divided by the total number of days spent fishing and hunting respectively. This provided a measure of daily expenditures made for hunting and fishing on public lands. Similarly, average daily expenditures were calculated for big game, small game, and migratory bird hunting.

For non consumptive wildlife-related use, certain expenditures were not included as they are typically for wildlife-related activities around the home or on private land. These include: bird houses; bird feeders; commercial bird seed; plantings; private land use or access fees; cabins; and land leasing and ownership. Again, for each state, wildlife viewing expenditure estimates were divided by the total number of days spent wildlife watching. This provided a measure of daily expenditures made for wildlife viewing on public lands.

The Survey does not have a separate category for fishing, hunting and wildlife-related use expenditures made on National Forest lands. For each recreational activity in each state, direct expenditures per day for all expenditure items were multiplied by estimated days of participation on Forest Service lands, to derive total expenditures on Forest Service lands. Retail sales for the region would then be the sum of state expenditures in that region.

Expenditure data were extracted from the 1991 National Survey, and the same methods, as described above for calculating the 1996 estimates, were used to determine 1991 expenditures made for hunting, fishing, and wildlife viewing on National Forest lands. Also, 1991 expenditure estimates were adjusted for inflation to represent 1996 dollars.

Margins

Retail sales (recreationist expenditures) were separated into manufacturing, wholesale and retail sub-categories because economic impact analyses treats each segment as separate industries. The amount of each retail sale attributed to each segment is known as a margin. A margin is the percentage, or mark-up, of a sale attributable to either the retail, wholesale or manufacturing sector. For example, 70 percent of the final retail dollar value of a shotgun sale may be attributed to the manufacturer, 5 percent to the wholesaler and 25 percent to the retailer. This means that the manufacturing industry has earned 70 percent of the final retail price, the wholesaler accrued 5 percent of the sale, and the retailer received 25 percent. Since there are no wholesale or manufacturing activities in the service sector, services are not subjected to the above process.

Retail and wholesale margins (the percentage markup made over costs by retailers or wholesalers) were calculated using gross margin and sales data from the U.S. Census Bureau publications The Annual Retail Trade Survey: 1986 to 1996 and The Annual Benchmark Report for Wholesale Trade: January 1987 to February 1997 for 1996 retail and wholesale sectors. Gross margins were divided by the corresponding sales figures to calculate the margins for the retailers and wholesalers in question. These margins were then used to calculate the percentage of an expenditure which can be attributed to retailers and wholesalers for a given product. The formulae used were:

Retailer portion = R / (1+R)

Wholesaler portion = W / [(1+R) * (1+W)]

where W = wholesale margin and R = retail margin.

Manufacturing portions were then calculated by subtracting retail and wholesale portions from 100 percent. Market portions were calculated for industry sectors as classified by Standard Industrial Classification codes.

Economic Impact Modeling

To estimate the economic impacts the data were analyzed with an economic model: the RIMS-II Regional Input-Output model. The RIMS-II model was developed by U.S. Dept. of Commerce, Bureau of Economic Analysis for primary use by the federal government. Input-output models describe how sales in one industry impact other industries. For example, once a sportsman 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 wages and salaries paid by these businesses stimulate more benefits. Simply, the first purchase creates numerous rounds of purchasing. Input-output analysis tracks how the various rounds of purchasing benefits other industries and generates economic benefits.

The relationships between industries are explained through multipliers. For example, an income multiplier of 0.09 for industry X would indicate that for every dollar received by the industry under study, nine cents would be paid to the employees of industry X. The RIMS-II model provides multipliers for all major industries. The multipliers include direct, indirect and induced effects. The RIMS-II model includes output, earnings and employment multipliers. The output multiplier measures the total economic effects created by the original retail sale. The earnings multiplier measures the total salaries and wages generated by the original retail sale. The employment multiplier estimates the number of jobs supported by the original retail sale.

To apply the RIMS-II model, recreationist expenditures are each matched to the appropriate output, earnings and employment multipliers. For example, dollars attributed to gasoline refining are multiplied separately by the earnings, output and employment multipliers specific to gasoline refinement. The resulting estimates describe the salaries and wages, total economic effects, and jobs supported by the refining industry as a result of fuel purchases made by recreationists. This same process is repeated for all reported expenditures. After all expenditures and multipliers have been applied together, the retail, wholesale and manufacturing results for each category are summed together. Total economic output represents the direct, indirect, and induced impacts.

Tax Revenues

State sales tax revenues were calculated by multiplying expenditures on goods and services by the respective state sales tax rates and fuel expenditures by fuel tax rates from 1996. Tables providing sales and fuel tax information were obtained from the Commerce Clearing Houses State Tax Guide. Prevailing gasoline prices were obtained from the Census Bureau. Due to the widely differing fees, wholesaler/manufacturer and use taxes were not included in this study.

Income tax figures could not be calculated simply from earnings because of the progressive nature of most state income tax systems. Instead, income tax revenues were estimated by calculating earnings per job for each state. The taxes paid on this average level of earnings were determined using income tax tables from the Commerce Clearing House. The average earnings per job were reduced by the applicable standard deductions and exemptions to approximate the taxable portion of earnings subject to income taxes. The taxes per job were then multiplied by the total number of jobs to provide an estimated total income tax figure.

Similarly, federal income tax revenues were calculated by dividing the total income generated by recreationists expenditures by the total number of jobs supported by recreationists expenditures. The result was the average income per job. From this, a standard deduction (per 1996 tax return forms, 1040-EZ) was subtracted. The applicable tax rate was then applied according to the 1996 IRS tax schedule for single filers to determine the average tax paid per job. Finally, the average tax paid per job was multiplied by the total number of jobs to determine the total federal income tax revenue generated by recreationists in 1996. Efforts were not made specifically to account for deductions such as itemized expenses (house/mortgage interest, etc.) due to the widely divergent nature of these deductions.

Standard Errors

Standard errors were calculated for participation and expenditure estimates in order to determine if these estimates were significant. Standard errors are indicators of the precision of participation and expenditure estimates. Also, multiplying standard errors by 1.96 will yield 95% confidence intervals.

The formula used to calculate standard errors is described in Appendix 4. Parameters for calculating fishing, hunting, and wildlife viewing standard errors are contained in Appendices 5, 6, and 7.

For each activity, economic impact estimates for individual expenditure items were summed and state level estimates are presented in Appendix 8 to Appendix 12. Regional estimates for expenditures, output, wages, full time equivalent (FTE) jobs, and taxes were calculated as the sum of respective estimates for individual states within the region. Standard errors for regional estimates were calculated as the square root of the sum of the variances for individual state estimates within the region. Table 2 to Table 11 provides these regional summaries for fishing, wildlife viewing, and hunting. Table 1 contains the national summary of participation and economic impacts of all wildlife related recreation activities within the National Forest System.

RESULTS

Wildlife related recreation (fishing, wildlife viewing, and hunting) on National Forest lands provides significant benefits to state and regional economies throughout the nation. In 1996, wildlife related recreation on Forest Service lands contributed nearly $21 billion to the nations economy. This economic activity supported 238,800 full time equivalent jobs, and generated $421 million in state sales and income taxes (Table 1). Within the National Forest System, fishing generated the largest economic impact, followed by hunting and wildlife viewing.

The discussion on results begins by focusing on the economic contributions of fishing on National Forest lands, then the economic benefits of wildlife viewing is presented, followed by the economic contributions of hunting on National Forest lands. These results reflect participation and economic data for 1996. Economic impacts are calculated at the state and regional level. These estimates do not reflect the economic impact of wildlife related recreation in local communities close to National Forest locations. Regional summaries are presented in this section and state wide estimates are contained in the Appendix section. In addition, trends in participation and retail sales between 1991 and 1996 are discussed.

One of the most important trends observed nationwide on both public and private lands was an increase in avidity among hunters and anglers nationwide between 1991 and 1996 (U.S. Department of the Interior, 1997). However, there was a significant decline in the number of wildlife watching participants and days of participation in 1996 compared to 1991 (U.S. Department of the Interior, 1997). From 1991 to 1996 the U.S. economy recovered from a mild recession and average real disposable personal income increased. This resulted in increased spending by American consumers on leisure activities and recreational equipment.

Economic Impacts of Fishing on National Forest Lands

A total of $2.9 billion was spent by U.S. anglers for fishing activities on Forest Service lands during 1996 (Table 2). Over 40% was trip related expenditures such as food and lodging, and the rest for equipment purchased primarily for fishing and other purchases specifically related to inland fishing (Figure 1). A full description of these expenditure categories is contained in Appendix 3.

The total economic effect from 1996 National Forest fishing is estimated at $8.5 billion. Total household income generated from fishing is estimated at $2.2 billion. Fishing activities on National Forest lands supported 95,718 full time equivalent jobs. State sales tax revenue is estimated at $128.2 million, state income tax and federal income tax revenues are estimated at $33.5 million and $241.6 million, respectively (Table 2).

Between 1991 and 1996 there was an increase of 26% in days of participation and a 58% increase in expenditures made for fishing within the National Forest System (Table 3). An increase in participation was observed in all regions during this time period, except for region 1 where participation declined by 4.4% (Table 3). Expenditures increased for all regions during this five year span. This is due to both an increase in days fished and an increase in average daily expenditures.

Economic Impacts of Wildlife Viewing on National Forest Lands

A total of $2.1 billion was spent by non consumptive wildlife recreationists on National Forest lands during 1996 (Table 4), and more than 50% was spent on trip related items (Figure 1). The total economic effect from this retail spending was $6.3 billion. Total household income generated from wildlife viewing on National Forest lands in 1996 is estimated at $1.6 billion. These activities also supported 70,372 full time equivalent jobs. State sales tax revenue generated from 1996 wildlife viewing expenditures is estimated at $98.8 million. Non consumptive recreation within the National Forest System also generated $22.5 million in state income taxes and $177.6 million in federal income tax revenue (Table 4).

In contrast to fishing trends, non-consumptive wildlife related recreation within the National Forest System declined during the period 1991 to 1996. This declining trend was also observed nationwide on both private and public lands (U.S. Department of the Interior, 1997).Within the National Forest System, days of participation declined by 16% and expenditures declined by 12% between 1991 and 1996. This decline was observed in all regions except regions 2, 3, and 10 (Table 5).

Economic Impacts of Hunting on National Forest Lands

A total of $2.1 billion was spent by participants hunting on National Forest lands during 1996 (Table 6). Unlike fishing and wildlife viewing a smaller portion of these expenditures were for trip related items (Figure 1). The total economic effect from all types of hunting on National Forest lands is estimated at $6.1 billion. These activities also supported 72,719 full time equivalent jobs and $1.7 billion in total household income. State sales tax revenue generated from all expenditures for hunting on National Forest lands is estimated at $105.7 million. Total state and federal income tax revenues generated by hunting are estimated at $32.6 million and $181.7 million, respectively (Table 6).

Similar to the fishing trends, hunting days and expenditures increased during the period 1991 to 1996. Between 1991 and 1996, days of participation increased by 25% within the National Forest System, and expenditures increased by 89%. An increase in participation was observed in all regions during this time period, except for region 1 where participation declined by 10.6%. Expenditures increased for all regions during this five year span (Table 7). Economic impact analysis was carried out separately for big game, small game, and migratory bird hunting within the National Forest System.

TABLE 1

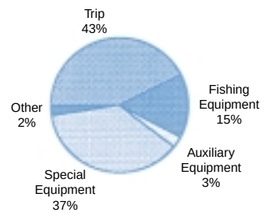
Summary of Economic Impact of Fishing, Hunting, and Wildlife Viewing on National Forest Lands, 1996

Activity	Total Days of Participation	Retail Sales	Exp. per person per day	Economic Output	Personal Income	FTE Jobs	State Sales Tax	State Income Tax	Federal Income Tax
Freshwater Fishing	45,807,170	2,904,560,176	63	8,536,141,630	2,264,512,977	95,718	128,172,974	33,464,968	241,592,206
Wildlife Viewing	55,013,340	3,215,571,[illegible]	49	6,255,957,347	1,650,197,041	70,372	98,809,346	22,529,374	177,610,472
Hunting	27,760,733	1,461,405,[illegible]	76	6,124,546,761	1,687,393,336	72,719	105,692,948	32,637,297	181,712,159
All Wildlife Dependent Recreation	127,647,555	6,842,[illegible]	53.04	20,896,645,185	5,582,103,354	238,809	332,715,468	88,641,234	600,854,836
Big Game Hunting	10,395,895	1,299,057,417	75	4,654,287,029	995,066,[illegible]	42,225	65,106,222	21,170,881	107,855,905
Small Game Hunting	7,001,045	224,812,940	35	465,353,177	179,317,871	5,102	16,449,054	1,114,952	15,023,346
Migratory Bird Hunting	7,918,551	245,349,722	83	741,348,209	107,559,450	8,861	15,733,594	3,647,225	20,963,379

Figure 1: Breakdown of Expenditures for Fishing, Hunting, and Wildlife Viewing on National Forest Lands, 1996

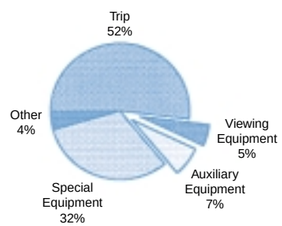
Fishing Expenditures

Trip	1,236,358,254
Fishing Equipment	444,047,246
Auxiliary Equipment	74,875,136
Special Equipment	1,070,418,335
Other	72,266,495
TOTAL	2,904,565,516



Wildlife Viewing Expenditures

Trip	1,107,956,823
Viewing Equipment	109,657,293
Auxiliary Equipment	146,841,797
Special Equipment	675,851,662
Other	95,088,699
TOTAL	2,135,445,281



Hunting Expenditures

Trip	556,334,578
Hunting Equipment	772,725,727
Auxiliary Equipment	115,031,813
Special Equipment	158,268,324
Other	508,029,051
TOTAL	2,110,387,487

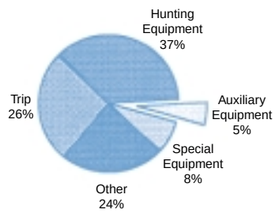


TABLE 2

Economic Impacts of Freshwater Fishing on National Forest Lands by Region, 1996

Region	U.S. Freshwater Fishing Days	St. error	Retail Sales	St. error	Exp. per person per day	Economic Output	Personal Income	FTE Jobs	State Sales Tax	State Income Tax	Federal Income Tax
Region 1	3,491,508	195,238	312,023,253	21,098,601	$89	551,278,432	165,612,303	6,327	2,900,921	1,151,372	9,485,951
Region 2	4,353,725	320,877	375,627,285	47,390,834	$74	691,133,854	201,537,096	7,946	3,292,689	634,867	17,519,947
Region 3	1,447,376	159,591	253,007,324	33,706,517	$75	461,455,145	123,461,065	6,432	2,651,366	2,156,810	12,179,551
Region 4	1,914,614	215,612	267,706,426	20,979,718	$59	415,722,065	117,716,374	6,637	1,868,357	3,454,715	10,751,925
Region 5	6,788,555	1,265,173	551,057,347	100,155,579	$41	1,165,396,554	304,625,356	12,500	11,863,443	6,395,032	38,054,257
Region 6	4,980,194	615,553	283,350,631	31,603,965	$47	443,167,815	119,985,962	5,563	4,216,275	4,450,405	12,475,826
Region 8	5,764,720	190,830	270,545,071	17,605,061	$47	541,899,455	142,806,392	7,174	12,575,262	4,321,806	14,260,925
Region 9	12,956,804	1,411,528	665,493,636	53,658,784	$51	1,322,761,586	301,437,026	7,336	35,187,330	13,939,350	37,051,174
Region 10	1,554,726	156,454	126,590,717	31,888,438	$60	231,133,437	60,332,193	2,872	[illegible]	[illegible]	6,126,645
Total Forest Service	46,897,170	2,045,858	2,904,560,516	336,993,974	$62	5,599,141,856	1,344,542,277	65,738	138,173,074	33,464,908	241,592,006

TABLE 3

Trends in Freshwater Fishing Participation and Expenditures on National Forest Lands Between 1991 and 1996

Region	Freshwater Fishing Days 1991	Freshwater Fishing Days 1996	Freshwater Fishing Retail Sales 1991	Freshwater Fishing Retail Sales 1996
Region 1	2,636,000	2,491,898	$142,168,934	$212,621,235
Region 2	4,562,000	4,837,719	$254,514,982	$350,620,285
Region 3	2,782,000	1,443,216	$222,410,451	$253,367,326
Region 4	2,692,000	2,014,638	$162,134,174	$231,705,426
Region 5	4,352,000	6,785,537	$236,438,076	$331,[illegible]
Region 6	4,257,000	4,989,194	$228,831,561	$233,[illegible]
Region 8	5,534,000	5,764,720	$180,[illegible],454	$270,833,671
Region 9	9,379,000	12,996,400	$297,063,066	$6[illegible],993,436
Region 10	937,000	1,584,728	$105,266,804	$126,299,717
Total Forest Service	37,120,000	46,407,370	$1,829,360,168	$2,904,560,516

Big Game Hunting

Big game hunting was the most popular type of hunting on National Forest lands. In 1996 U.S. hunters spent a total of $1.26 billion on big game hunting trips within the National Forest System (Table 8). This represents about 60% of expenditures for all types of hunting on National Forest lands.

The sum of the direct, indirect, and induced effects attributed to 1996 big game hunting on National Forest lands is estimated at $3.6 billion. Big game hunting also supported 42,225 full time equivalent jobs. These are jobs that are directly associated with hunting in addition to jobs in industries that indirectly support hunting. State sales tax revenue generated from big game hunting is estimated at $65.2 million. Total state income tax revenue generated by 1996 big game hunting was $21.2 million and total federal income tax revenue generated was $107.9 million (Table 8).

Small Game Hunting

A total of $227.8 million was spent for small game hunting activities on National Forest lands during 1996 (Table 9). The total economic effect from 1996 small game hunting on National Forest lands is estimated at $663.3 million. Total household income generated from small game hunting on National Forest lands is estimated at $179.9 million. Small game hunting also supported 8,102 full-time equivalent jobs. These are jobs that are directly associated with hunting in addition to jobs in industries that indirectly support hunting (Table 9). For regions 5 and 10 sample sizes were too small to allow calculation of individual regional estimates. Instead these regions were combined, and aggregate estimates are presented (Table 9).

Migratory Bird Hunting

A total of $243.3 million was spent for migratory bird hunting activities on National Forest lands during 1996, which cycled through the economy resulting in a total economic effect of $714.3 million (Table 10). Total household income generated from migratory bird hunting on National Forest lands is estimated at $197.6 million, which supported 8,801 full time equivalent jobs. State sales and income tax revenues, and federal income tax revenue are presented in Table 6. Only small sample sizes were available for regions 5, 6, and 10, and thus individual regional estimates could not be calculated. Instead these regions were combined, and aggregate estimates are presented (Table 10).

Trends in hunting days and expenditures between 1991 and 1996 for big game, small game, and migratory bird hunting are presented in Table 11. During this five year period, the largest increases in days of hunting and expenditures was for migratory bird hunting on Forest Service lands. This is consistent with the findings from the National Surveys that showed migratory bird hunting on all public lands increased from 5.6 million days in 1991 to 7.8 million days in 1996 (U.S. Department of the Interior, 1997, and U.S. Department of the Interior, 1993).

Other Revenue

Hunting and fishing on National Forest lands provide other sources of government revenues beside taxes. Most recreationists are required to buy a state hunting or fishing

license and often one or more specialized state/federal permits and/or national forest stamps. The revenues raised from these license/permit sales are used to support wildlife and habitat conservation and management efforts.

In addition to licenses and permits sales, states obtain funds for wildlife management under the Federal Aid in Wildlife Restoration Act (Pittman-Robertson Act) and the Sportfish Restoration Act (Wallop-Breaux). The funds receive income from excise taxes on equipment commonly used by sportsmen on National Forests. The funds are exclusively dedicated for wildlife and fish enhancement projects, and education. These additional revenue sources were not included in the analysis.

TABLE 4

Economic Impacts of Wildlife Viewing on National Forest Lands by Region, 1996

Region	U.S. Wildlife Viewing Days	[illegible]	Retail Sales	[illegible]	Exp. per person per day	Economic Output	Personal Income	FTE Jobs	State Sales Tax	State Income Tax	Federal Income Tax
Region 1	1,498,266	216,895	93,454,574	32,861,516	$42	118,445,549	31,100,262	1,975	556,575	356,941	2,904,104
Region 2	6,347,694	937,522	225,403,173	43,025,425	$36	405,580,464	130,049,527	3,599	7,053,450	516,092	15,997,723
Region 3	2,690,541	1,024,054	200,423,052	47,396,416	$74	309,613,865	93,624,346	4,775	10,021,198	1,634,413	8,716,764
Region 4	1,160,039	238,598	65,633,750	16,688,296	$57	121,538,154	34,479,582	1,924	3,471,501	1,199,045	3,437,635
Region 5	7,000,999	1,981,303	223,132,482	54,225,791	$77	567,861,339	141,624,545	5,911	13,627,946	2,156,594	16,999,518
Region 6	5,448,427	761,114	172,017,618	81,790,877	$55	502,564,754	151,744,543	6,920	14,217,591	2,334,245	15,804,107
Region 8	13,584,102	1,328,128	501,754,937	55,914,599	$44	1,130,253,952	333,534,021	16,442	29,145,513	7,321,694	33,073,394
Region 9	14,801,421	1,556,780	406,767,500	47,511,595	$35	826,144,041	215,662,017	11,364	19,428,653	6,869,490	23,187,319
Region 10	372,113	69,944	99,855,045	7,508,333	$105	66,734,619	20,542,055	1,341	[illegible]	[illegible]	3,212,112
Total Forest Service	53,013,603	3,238,571	2,135,445,261	137,814,346	$40	6,255,957,247	1,650,894,043	50,352	98,849,546	29,589,059	127,610,452

TABLE 5

Trends in Wildlife Viewing Participation and Expenditures on National Forest Lands Between 1991 and 1996

Region	Wildlife Viewing Days 1991	Wildlife Viewing Days 1996	Wildlife Viewing - Retail Sales 1991	Wildlife Viewing - Retail Sales 1996
Region 1	2,249,175	1,498,266	$68,747,607	$63,454,574
Region 2	4,957,776	6,347,694	$160,681,351	$225,403,173
Region 3	1,999,265	2,690,541	$126,175,210	$200,423,052
Region 4	1,058,603	1,160,039	$[illegible]	$65,633,750
Region 5	13,527,504	7,000,999	$644,098,648	$223,132,482
Region 6	6,519,602	5,448,427	$361,125,343	$172,017,618
Region 8	11,875,083	13,584,102	$695,301,670	$501,754,937
Region 9	16,362,577	14,801,421	$485,159,399	$406,767,500
Region 10	250,958	372,113	$12,202,252	$99,855,045
Total Forest Service	63,391,632	53,013,603	$2,456,333,854	$2,135,445,261

TABLE 6

Economic Impacts of Hunting on National Forest Lands by Region, 1996

Region	F.S. Hunting Days	st. error	Retail Sales	st. error	Exp. per person per day	Economic Output	Personal Income	FTE Jobs	State Sales Tax	State Income Tax	Federal Income Tax
Region 1	1,202,461	118,711	106,261,533	11,417,319	$88	188,496,925	51,652,917	3,703	3,362,565	1,558,935	4,708,675
Region 2	2,098,538	529,827	311,676,006	54,559,585	$115	631,962,689	179,537,283	9,535	15,531,264	4,230,435	12,545,793
Region 3	606,833	151,037	89,585,565	21,508,417	$130	168,646,677	46,536,690	2,318	4,536,326	1,050,756	4,565,735
Region 4	1,538,151	230,035	145,093,907	32,136,716	$91	334,144,014	78,442,166	4,305	9,123,137	2,090,911	7,477,691
Region 5	1,342,445	668,738	143,796,379	86,551,564	$105	302,853,976	115,959,689	4,861	11,925,305	1,551,225	12,599,526
Region 6	2,818,155	556,555	350,105,860	55,124,147	$82	471,491,705	136,755,585	5,886	7,637,477	6,801,814	17,229,309
Region 8	5,337,241	639,502	468,550,636	45,985,464	$54	930,184,693	362,815,559	11,398	35,755,664	7,753,218	26,466,730
Region 9	9,305,347	795,396	657,459,146	61,087,754	$54	990,751,398	352,428,672	14,027	39,785,459	9,220,939	28,582,567
Region 10	936,743	55,711	99,930,748	14,388,910	$183	92,478,038	32,052,563	1,236	no tax	no tax	2,676,731
Total Forest	27,796,783	1,468,405	2,311,387,487	281,138,262	$76	6,129,546,101	1,687,931,306	72,714	105,642,948	32,647,203	101,748,149

TABLE 7

Trends in Hunting Participation and Expenditures on National Forest Lands Between 1991 and 1996

Region	Total Hunting Days 1991	Total Hunting Days 1996	Total Hunting Retail Sales 1991	Total Hunting Retail Sales 1996
Region 1	1,457,439	1,202,861	59,946,219	$104,261,535
Region 2	1,891,762	2,098,538	56,156,255	$311,676,909
Region 3	663,993	606,833	65,041,702	$84,585,565
Region 4	1,244,192	1,538,151	77,398,639	$145,093,907
Region 5	981,274	1,342,445	87,159,767	$143,796,379
Region 6	2,604,347	2,818,155	215,145,483	$350,105,860
Region 8	5,905,015	7,337,241	249,245,003	$468,550,636
Region 9	7,668,354	9,305,347	390,916,472	$657,459,146
Region 10	559,261	936,743	59,698,359	$99,930,748
Total Forest Service	22,368,497	27,796,783	1,115,119,244	2,311,387,487

TABLE 8

Economic Impacts of Big Game Hunting on National Forest Lands by Region, 1996

Region	F.S. Big Game Hunting	Retail Sales	Exp. per person per day	Economic Output	Personal Income	FTE Jobs	State Sales Tax	State Income Tax	Federal Income Tax
Region 1	896,398	96,465,561	$72	173,648,564	52,550,676	2,346	3,312,056	937,611	2,573,869
Region 2	1,996,312	317,036,579	$159	647,172,560	182,046,735	9,170	10,559,735	5,615,211	18,362,379
Region 3	247,387	38,140,658	$154	70,805,035	20,853,834	1,195	2,151,854	464,470	2,055,589
Region 4	1,059,529	95,585,304	$76	151,496,523	42,416,093	2,551	5,644,777	2,703,121	4,071,170
Region 5	807,598	51,960,490	$64	111,369,515	41,592,177	1,529	4,152,955	968,991	5,531,740
Region 6	2,986,699	176,885,272	$95	359,607,145	96,535,121	2,956	6,031,115	1,546,295	9,135,421
Region 8	4,608,765	265,141,225	$66	550,546,285	147,734,257	5,160	14,984,745	4,286,549	15,115,673
Region 9	5,032,054	243,615,569	$48	465,254,115	134,065,690	6,715	12,534,918	4,453,347	10,512,923
Region 10	326,706	15,296,438	$81	28,749,542	6,956,351	119	211,534		739,734
Total Forest Service	16,208,895	1,259,057,487	$78	3,634,287,024	995,766,397	42,525	65,896,622	21,170,088	107,878,995

CONCLUSION

The National Forest System provides high quality wildlife recreational opportunities throughout the nation. In addition, hunting, fishing and other wildlife-related activities on National Forest lands provide the U.S. and state economies with important sources of jobs, income and other benefits.

This study did not measure economic impact to local economies in close proximity to National Forest lands. However, benefits from wildlife related recreational activities are particularly important in rural or remote areas, where other sources of income are limited. By supporting billions in retail sales, tens of thousands of jobs and billions in salaries and wages, fishing, hunting and other wildlife-related activities are of great value not only to industry and local businesses, but to every resident of every community surrounding National Forest Service lands.

Apart from providing business and job opportunities, outdoor recreation contributes other benefits to our society. The American Recreation Coalition reported that Americans who participate in outdoor recreation during childhood and adulthood have an overall higher quality of life than others (ARC, 1996). In addition to contributing recreational activities, national forests provide aesthetically pleasing surroundings prized by millions of Americans who want to live and work in a rural setting.

TABLE 9

Economic Impacts of Small Game Hunting on National Forest Lands by Region, 1996

Region	F.S. Small Game Hunting Days	Retail Sales	Exp. per person per day	Economic Output	Personal Income	FTE Jobs	State Sales Tax	State Income Tax	Federal Income Tax
Region 1	292,489	6,024,698	$21	11,439,919	2,988,530	152	240,200	82,626	266,542
Region 2	550,444	46,081,480	$33	82,699,096	23,606,526	1,515	1,962,925	462,967	2,158,976
Region 3	198,795	8,600,848	$43	15,529,258	4,502,972	228	556,181	99,994	451,249
Region 4	467,463	18,079,159	$39	36,726,956	9,663,075	570	1,216,211	354,534	659,255
Region 6	576,550	15,206,715	$27	29,975,597	8,236,935	401	1,214,668	323,854	842,406
Region 8	1,578,796	43,604,617	$28	85,726,227	25,752,590	1,329	3,352,752	623,951	2,257,205
Region 9	3,604,126	72,409,659	$27	147,215,335	40,236,583	2,171	6,335,629	1,156,272	3,903,428
Regions 5 and 10*	495,082	22,985,742	$46	45,027,6[illegible]	13,141,321	565	310,535	126,005	1,412,634
Total Forest Service	7,863,045	227,812,946	$33	665,252,177	179,917,871	8,102	16,449,934	3,114,053	19,027,346

* It was not possible to calculate separate estimates for Region 5 and 10 as less than 30 observations of small game hunting on public lands were available for these regions

TABLE 10

Economic Impacts of Migratory Bird Hunting on National Forest Lands by Region, 1996

Region	F.S. Migratory Bird Hunting Days	Retail Sales	Exp. per person per day	Economic Output	Personal Income	FTE Jobs	State Sales Tax	State Income Tax	Federal Income Tax
Region 1	112,063	5,855,457	$78	16,076,693	4,369,505	265	404,573	120,157	294,638
Region 2	156,702	15,678,254	$115	32,294,990	8,470,332	400	606,268	205,804	534,372
Region 3	94,357	11,290,892	$120	20,933,872	5,939,150	215	611,021	137,577	589,500
Region 4	269,507	16,748,705	$62	33,458,615	9,076,190	535	1,040,929	331,067	836,271
Region 8	699,306	50,784,933	$73	101,524,948	29,251,329	1,518	2,923,353	564,669	2,263,001
Region 9	3,110,237	96,452,753	$31	194,206,625	54,417,260	2,754	7,214,876	1,309,254	5,456,598
Regions 5, 6, and 10	495,759	43,449,726	$88	87,679,282	24,519,313	1,162	2,742,583	276,602	2,551,628
Total Forest Service	3,918,551	240,259,721	$83	514,348,269	137,582,450	8,801	15,733,595	3,447,335	10,904,350

* It was not possible to calculate separate estimates for Region 5, 6 and 10 as less than 30 observations of migratory bird hunting on public lands were available for these regions. Also, small sample sizes did

TABLE 11

A Comparison of Participation and Expenditures for Big Game, Small Game, and Migratory Bird Hunting on National Forest Lands Between 1991 and 1996

Region	Big Game Hunting Days 1991	Big Game Hunting Days 1996	Big Game Retail Sales 1991	Big Game Retail Sales 1996	Small Game Hunting Days 1991	Small Game Hunting Days 1996	Small Game Retail Sales 1991	Small Game Retail Sales 1996	Migratory Bird Hunting Days 1991	Migratory Bird Hunting Days 1996	Migratory Bird Retail Sales 1991	Migratory Bird Retail Sales 1996
Region 1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Region 2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Region 3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Region 4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Region 5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Region 6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Region 8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Region 9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Region 10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total Forest Service	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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Appendix 1. Ratios Used to Calculate Freshwater Fishing Estimates on Forest Service Lands

Region/State	Surface Area of Lakes and Streams on National Forest Lands (Sq. miles)*	Surface Area of all Inland Water Bodies (Sq. miles)	Ratio
Alabama	25	968	2.6%
Alaska**	1,012	2,300	44.0%
Arizona	182	364	49.9%
Arkansas	54	1,107	4.9%
California	625	2,874	22.4%
Colorado	128.3	371	34.6%
Florida	205	4,683	4.4%
Georgia	49	1,011	4.7%
Idaho	488	823	59.3%
Illinois	42	2,325	1.8%
Indiana	11	550	2.0%
Kansas	1	459	0.2%
Kentucky	23	679	3.3%
Louisiana	63	4,153	1.5%
Maine	10	2,263	0.4%
Michigan	7,209	39,806	18.1%
Minnesota	811	7,326	11.1%
Mississippi	17	781	2.2%
Missouri	48	811	5.9%
Montana	952	1,490	63.9%
Nebraska	3	481	0.6%
Nevada	220	761	28.9%
New Hampshire	24	314	7.6%
New Mexico	91	234	38.9%
New York	1	1,888	0.1%
North Carolina	244	3,954	6.2%
North Dakota	43	1,710	2.5%
Ohio	91	3,875	2.3%
Oklahoma	9	1,224	0.7%
Oregon	397	1,050	37.8%
Pennsylvania	43	1,239	3.5%
South Carolina	19	1,006	1.9%
South Dakota	300	1,225	24.5%
Tennessee	30	925	3.3%
Texas	52	4,560	1.0%
Utah	1,050	2,736	38.4%
Vermont	40	366	10.9%
Virginia	78	1,000	7.8%
Washington	373	1,845	20.2%
West Virginia	15	145	10.7%
Wisconsin	710	11,188	6.3%
Wyoming	379	714	53.1%

* Made the assumption that the average width of streams on National Forest Lands was 0.005 miles.

** Used surface area of inland waters at Southeastern and South Central Alaska.

Appendix 2: Ratios Used to Calculate Hunting and Wildlife Viewing Estimates on F.S. Lands

Region/State	Forest Service Lands (acres/100)	Federal (acres/100)	State Public (acres/100)	County + Parish (acres/100)	Ratio of FS to all Public Lands for hunting*	Ratio of FS to all Public Lands for Wildl. View.**
Alabama	6,640	9,914	3,451	2,124	52.50%	44.96%
Alaska	220,047				37.26%	9.04%
Arizona	112,517	102,795	94,024	2,995	29.60%	27.52%
Arkansas	25,769	32,073	5,213	357	69.30%	65.65%
California	206,277	167,924	21,412	3,509	42.15%	41.83%
Colorado	145,081	239,229	29,621	608	52.96%	53.94%
Florida	11,412	32,914	24,351	1,912	18.43%	17.[illegible]%
Georgia	5,049	20,865	7,423	1,589	39.15%	26.79%
Idaho	294,008	312,950	25,771	153	57.03%	56.95%
Illinois	2,775	5,295	4,827	3,271	27.6[illegible]%	22.95%
Indiana	2,956	4,875	5,110	1,455	19.58%	17.05%
Kansas	1,082	6,053	2,325	1,469	12.32%	12.55%
Kentucky	6,951	12,009	2,405	1,968	44.97%	41.[illegible]%
Louisiana	6,041	12,033	11,137	1,954	25.37%	23.15%
Maine	539	1,035	8,674	320	5.13%	4.58%
Michigan	28,570	31,655	45,044	4,128	37.25%	35.35%
Minnesota	28,375	33,822	59,451	25,540	39.42%	25.85%
Mississippi	11,582	12,289	5,466	3,874	50.96%	45.54%
Missouri	14,942	20,171	9,192	1,409	50.63%	48.34%
Montana	165,770	271,217	48,317	3,016	52.75%	52.26%
Nebraska	3,521	7,389	13,945	1,751	16.51%	15.35%
Nevada	62,755	602,896	1,186	591	10.80%	10.60%
New Hampshire	1,247	3,474	1,971	108	36.13%	35.37%
New Mexico	94,633	244,455	88,941	178	28.19%	28.17%
New York	161	2,306	38,745	2,360	0.19%	0.17%
North Carolina	12,435	24,477	8,345	734	37.59%	37.01%
North Dakota	1,058	16,509	9,577	4,851	38.02%	32.55%
Ohio	3,772	1,754	5,275	3,116	25.17%	18.71%
Oklahoma	3,459	12,029	11,365	845	14.58%	14.05%
Oregon	156,564	322,909	13,581	2,267	46.47%	46.16%
Pennsylvania	5,153	6,829	36,955	1,255	11.75%	11.05%
South Carolina	6,124	12,562	7,589	1,095	31.22%	29.65%
South Dakota	29,131	39,069	11,777	1,655	60.29%	47.37%
Tennessee	6,341	13,792	6,459	1,862	31.31%	28.67%
Texas	6,759	32,026	59,010	3,756	9.51%	8.57%
Utah	81,127	355,815	32,521	345	67.00%	20.57%
Vermont	3,664	3,686	1,917	-	65.22%	65.22%
Virginia	16,570	27,591	3,508	707	60.44%	58.95%
Washington	91,771	124,789	31,963	1,555	58.54%	57.97%
West Virginia	10,326	12,700	3,031	269	68.72%	67.35%
Wisconsin	15,211	18,390	23,910	37,556	47.24%	25.46%
Wyoming	92,477	300,199	24,292	151	62.09%	23.63%

* Forest Service acreage divided by the same (federal, state public acreage)
Estimates for Alaska, Utah and Wyoming were obtained from other sources.

** Forest Service acreage divided by the sum of (federal, state public, and local municipal acreage)

Appendix 3: Description of Expenditure Categories for Wildlife Recreation

Fishing Expenditures

Trip:	Food, Lodging, Transportation, Fuel, Guide Fees, Package Fees, Public Land Use or Access Fees, Boat Costs, Equipment Rental, Bait, Ice.
Fishing Equipment:	Rods, Reels, Poles and Rod Making Components, Lines and Leaders, Artificial Lures, Files, Hooks, Sinkers, Tackle Boxes, Electronic Fishing Devices, Ice Fishing Equipment, Other Fishing Equipment.
Auxiliary Equipment:	Camping Equipment, Binoculars, Field Glasses, Telescopes, etc., Special Fishing Clothing, Foul Weather Gear, Boots, Waders, etc.
Special Equipment:	Boats, Trailer/Hitch or Other Boat Accessories, Off Road Vehicles and Other Special Equipment.
Other:	Fishing License Fees, Other Fees, Processing and Taxidermy Costs, Books and Magazines Dues or Contributions to Organizations, Other Purchases.

Wildlife Viewing Expenditures

Trip:	Food, Lodging, Transportation, Fuel, Guide Fees, Package Fees, Public Land Use or Access Fees, Boat Costs, Equipment Rental.
Viewing Equipment:	Binoculars, Field Glasses, Telescopes, etc., Photographic Equipment, Special Clothing, and Other Wildlife Watching Equipment.
Auxiliary Equipment:	Camping Equipment, and Other Auxiliary Equipment.
Special Equipment:	Off Road Vehicle, Travel or Tent Trailer, Camper, Van, Pickup, Motor Home, Other.
Other:	Books and Magazines, Dues or Contributions to Organizations.

Hunting Expenditures

Trip:	Food, Lodging, Transportation, Fuel, Guide Fees, Package Fees, Public Land Use or Access Fees, Boat Costs, Equipment Rental.
Hunting Equipment:	Guns and Rifles, Archery Equipment, Telescopic Sights, Decoys and Game Calls, Ammunition, Hand Loading Equipment, Hunting Dogs, Other.
Auxiliary Equipment:	Camping Equipment, Binoculars, Field Glasses, Telescopes, etc., Special Clothing, Foul Weather Gear, Boots, Waders, etc.
Speical Equipment:	Boats, Trailer/Hitch or Other Boat Accessories, Off Road Vehicles and Other Special Equipment.
Other:	License Fees, Other Fees, Processing and Taxidermy Costs, Books and Magazines Dues or Contributions to Organizations, Other Purchases.

Appendix 4: Method for Calculating Standard Errors

Standard Errors

The formula below was used to calculate the standard error of days of participation and expenditures estimates on national Forest lands:

$$S_x = \sqrt{ax^2 + bx - \frac{cx^2}{y}}$$

Here:
x is the size of the estimate which could be participation or expenditures depending on the calculation;

y is the base of the estimate (the number of participants);

a, b, and c are the parameters associated with the particular characteristic (U.S. Department of Interior, 1997). A separate set of parameters is required for estimation of standard errors for participation and expenditures.

Parameters for calculating fishing, hunting , and wildlife viewing standard errors are contained in Appendices 3, 4, and 5

Appendix 5: Parameters Used to Calculate Variances for Fishing Days and Expenditures

State	Parameters for Days			Parameters for Expenditures		
	a	b	c	a	b	c
Alabama	0.011070	-11.882	13,572	0.022140	-31,879	7,632
Alaska	0.033200	-490	902	0.023245	-15,072	1,467
Arizona	0.056570	4.295	1,498	0.025451	1,413	4,134
Arkansas	0.013786	2.954	3,940	0.046100	-35,277	5,033
California	0.029946	-4.196	10,727	0.020212	-130,816	28,097
Colorado	0.005428	2.[illegible]	5,282	0.027113	51,[illegible]	5,499
Florida	0.013367	-24.334	31,357	0.018472	-54,519	21,567
Georgia	0.002290	-20.940	25,636	0.017194	33,491	10,236
Idaho	0.004423	18.640	8,978	0.015456	19,925	3,502
Illinois	0.001866	-31.975	21,385	0.023597	-118,977	16,341
Indiana	-0.005906	-10.385	13,612	0.038054	-37,770	7,805
Kansas	0.072300	-1.100	2,570	0.022115	5,085	2,587
Kentucky	0.003450	-4.425	6,292	0.032294	-35,485	6,480
Louisiana	0.027440	-12.750	15,168	0.017738	-6,371	10,747
Maine	0.009850	-5.593	3,250	0.051020	-11,191	2,468
Michigan	0.013477	54.347	20,932	0.017786	-94,388	17,923
Minnesota	0.067180	-14.167	13,867	0.015251	-2,890	10,828
Mississippi	0.002498	-3.774	5,338	0.015820	-34,650	7,371
Missouri	-0.015381	-20.814	23,468	0.031520	-38,417	8,625
Montana	0.007359	-729	1,403	0.012955	-4,035	1,384
Nebraska	0.001529	2.946	2,630	0.019808	3,439	1,832
Nevada	0.008312	-7.069	7,857	0.006382	-11,673	2,767
New Hampshire	0.021018	-743	1,202	0.060070	-13,210	1,758
New Mexico	0.058130	-319	1,665	0.029329	-4,102	1,937
New York	0.006821	-76.595	25,019	0.013940	128,454	20,807
North Carolina	0.026990	7,929	12,144	0.038150	-174,985	18,106
North Dakota	0.000737	-1,335	1,770	0.021375	-777	752
Ohio	-0.006811	-17,553	22,133	0.018212	78,116	14,481
Oklahoma	0.004210	22,701	22,462	0.043330	-88,648	10,647
Oregon	-0.003614	-13,057	17,357	0.008560	-51,773	11,911
Pennsylvania	-0.004771	-29,038	23,722	0.009523	130,047	20,372
South Carolina	0.010055	-1,772	3,337	0.032550	-45,811	5,362
South Dakota	-0.017421	-2,325	3,861	0.008800	-27,856	3,357
Tennessee	-0.010925	-15,875	20,791	0.022255	24,179	11,024
Texas	0.084350	23,030	28,511	0.032803	-330,879	38,595
Utah	-0.010885	-7,389	6,713	0.009675	-16,645	3,479
Vermont	-0.011966	-3,527	2,815	0.007530	23,073	2,991
Virginia	0.035180	125,224	9,203	0.007270	-173,723	15,133
Washington	0.039450	61,588	6,373	0.033116	-35,564	8,578
West Virginia	0.014577	-1,405	2,805	0.018591	29,940	4,800
Wisconsin	-0.002327	13,228	11,352	0.011515	-32,450	11,367
Wyoming	0.032876	-753	1,220	0.022142	-1,129	914
USA	-0.000467	-324,198	68,529	0.000150	-197,573	34,364

Appendix 6: Parameters Used to Calculate Variances for Hunting Days and Expenditures

State	Parameters for Days			Parameters for Expenditures		
	a	b	c	a	b	c
Alabama	0.058950	1,149	4,361	0.041030	-34,071	6,795
Alaska	0.011783	-2,797	1,533	0.043010	-17,754	1,016
Arizona	0.082450	-2,138	2,510	0.073690	295,994	5,746
Arkansas	0.134810	7,860	5,216	0.128750	-273,547	4,961
California	0.175460	-18,157	11,832	0.121120	-136,518	11,476
Colorado	0.073060	-15,717	7,368	0.128990	19,131	3,212
Florida	0.058830	11,352	12,144	0.051760	-276,536	15,998
Georgia	0.039602	-4,615	8,856	0.077200	-264,814	8,367
Idaho	0.012581	-6,338	3,657	0.028210	102,915	3,821
Illinois	0.010252	-13,269	10,590	0.027065	-235,302	13,766
Indiana	0.040000	5,762	4,345	0.044360	-113,075	5,115
Kansas	0.075360	-3,738	3,786	0.094000	-144,269	3,870
Kentucky	0.005257	-9,012	6,791	0.031020	271,398	9,351
Louisiana	-0.008308	11,412	9,109	0.037410	-176,658	8,417
Maine	0.055710	-6,057	2,589	0.115060	-62,158	3,145
Michigan	0.024383	-8,048	15,439	0.021450	-388,383	27,458
Minnesota	0.003570	-8,330	10,044	0.045130	-184,991	11,309
Mississippi	-0.006274	-3,463	4,651	0.001990	70,252	7,986
Missouri	0.032758	3,368	7,231	0.023035	-171,746	14,407
Montana	0.002089	-3,270	2,766	0.009135	1,629	2,229
Nebraska	0.057340	-617	1,463	0.015060	21,110	2,670
Nevada	0.032699	-1,206	1,238	0.073300	-57,000	1,723
New Hampshire	0.011513	764	1,264	0.070440	-23,166	1,638
New Mexico	-0.008373	507	1,518	0.095033	-40,824	1,474
New York	0.035049	-13,967	10,989	0.020680	107,377	14,784
North Carolina	0.028400	5,922	10,982	0.045760	1,356	8,152
North Dakota	0.030889	-488	975	0.024171	-23,882	1,149
Ohio	0.005266	-4,917	9,261	0.011040	-260,018	17,181
Oklahoma	0.022440	12,432	10,113	0.038030	-41,671	8,498
Oregon	0.047340	-8,333	6,034	0.050460	225,614	6,861
Pennsylvania	0.005850	-13,459	11,579	0.053860	-165,572	13,311
South Carolina	0.012310	7,443	9,606	0.013070	-185,472	6,243
South Dakota	0.000347	264	1,573	0.014269	574	1,458
Tennessee	0.043330	-14,555	7,158	0.047520	489,535	13,855
Texas	0.093980	-7,271	15,821	0.019380	-347,415	29,092
Utah	0.061040	-5,144	3,385	0.112810	-242,080	3,935
Vermont	-0.002375	-458	1,235	0.012530	35,217	1,730
Virginia	0.072310	288	5,100	0.089520	-233,863	6,212
Washington	-0.053873	-15,132	10,364	0.105190	41,284	6,383
West Virginia	0.033992	1,412	3,115	0.012350	-42,917	4,494
Wisconsin	0.044301	-28,411	12,427	0.013420	125,738	10,357
Wyoming	0.003873	-1,046	1,562	0.070793	-37,872	1,042
USA	0.030284	64,721	23,574	0.000277	-478,142	33,707

Appendix 7: Parameters Used to Calculate Variances for Wildlife Viewing Days and Expendi

State	Parameters for Days			Parameters for Expenditures		
	a	b	c	a	b	c
Alabama	0.011382	3,093	5,929	0.035881	18,572	3,916
Alaska	0.033700	-493	902	0.033200	-485	902
Arizona	0.232510	-7,281	4,855	0.059000	-24,154	3,985
Arkansas	0.120550	6,939	4,442	0.039340	-17,237	7,687
California	0.052850	-492,479	107,634	0.035321	1,067,637	50,145
Colorado	0.017830	20,910	22,425	0.049110	561,649	39,426
Florida	0.017280	-54,794	47,009	0.031930	-252,097	42,131
Georgia	0.031240	-23,045	14,502	0.013984	-70,051	15,016
Idaho	0.052940	-2,501	4,459	0.074720	41,523	4,112
Illinois	0.027820	58,510	15,204	0.032920	-139,229	32,872
Indiana	0.122290	615	4,197	0.009681	-40,693	16,403
Kansas	0.046990	-3,363	5,621	0.049730	28,458	2,682
Kentucky	0.190170	34,100	7,178	0.057270	-82,496	7,465
Louisiana	0.057303	-3,617	5,930	0.015698	-55,977	11,140
Maine	0.051630	15,634	175	0.014378	32,355	3,270
Michigan	0.029483	37,292	38,827	0.061770	-186,154	77,084
Minnesota	0.112363	-726	8,605	0.027860	-580,903	26,760
Mississippi	0.147200	-4,125	3,214	0.097823	25,306	2,929
Missouri	0.128350	93,740	29,824	0.051350	-337,635	14,174
Montana	0.026541	-6,356	4,142	0.060400	-10,180	3,150
Nebraska	0.038910	7,544	6,580	0.022050	40,731	8,287
Nevada	0.059320	6,503	3,079	0.088910	-19,553	7,740
New Hampshire	0.020010	-11,117	17,071	0.073340	-15,254	6,644
New Mexico	0.215380	559	3,098	0.071300	19,200	2,055
New York	0.032550	33,900	37,845	0.067000	264,733	15,441
North Carolina	0.045300	-20,376	13,008	0.023769	75,746	15,550
North Dakota	0.020354	-1,274	1,794	0.022330	-1,760	1,453
Ohio	0.041150	22,185	16,184	0.032960	-395,966	40,707
Oklahoma	0.204560	-13,045	9,632	0.056700	20,480	5,897
Oregon	0.020200	30,938	18,514	0.055410	-43,805	8,458
Pennsylvania	0.039850	-65,757	60,257	0.082590	295,032	21,756
South Carolina	0.073840	-26,647	9,633	0.042330	19,528	4,583
South Dakota	0.144230	-15,927	2,618	0.033550	10,285	974
Tennessee	0.045640	19,995	16,505	0.136740	-192,356	13,204
Texas	0.207350	5,535	15,119	0.130150	-261,300	31,449
Utah	-0.003508	-3,355	7,127	0.051580	-4,056	5,598
Vermont	0.035450	10,053	2,023	0.095280	-1,430	1,518
Virginia	0.064850	-13,451	16,283	0.063470	4,565	14,345
Washington	-0.004180	17,729	27,976	0.100400	15,783	22,301
West Virginia	0.037480	-9,680	4,534	0.031240	12,231	3,875
Wisconsin	0.159790	-15,203	11,080	0.191550	350,528	-1,524
Wyoming	0.020135	-13,601	3,552	0.056740	-26,047	2,298
USA	0.004371	-26,991	38,948	0.002387	54,854	59,814

APPENDIX 8

Economic Impacts of Freshwater Fishing on National Forest Lands by State, 1996

Region/State	Forest Service Freshwater Fishing Days	Retail Sales	Expenditures per person per day	Economic Output	Personal Income	FTE Jobs	State Sales Tax	State Income Tax	Federal Income Tax
Region 1									
Idaho - Northern	780,614	55,899,434	$71	94,667,681	25,969,641	1,491	2,794,972	1,012,216	2,336,774
Montana	1,671,760	154,605,812	$92	204,838,958	78,659,865	4,779	no tax	136,782	7,078,072
North Dakota	33,561	2,116,956	$63	3,771,693	963,896	57	105,949	12,314	58,190
Region 2									
Colorado	2,547,102	216,119,292	$76	498,190,160	121,945,032	6,021	6,463,539	612,951	12,259,014
Kansas	4,327	310,402	$22	630,445	173,268	15	15,214	4,156	15,792
Nebraska	73,561	3,227,605	$36	2,113,236	672,184	37	96,380	17,695	94,365
South Dakota	673,407	50,165,615	$55	85,924,531	22,371,098	1,319	2,014,625	no tax	3,052,678
Wyoming	1,261,524	91,497,282	$41	155,957,699	38,373,042	2,456	3,659,891	no tax	7,337,507
Region 3									
Arizona	2,543,210	177,612,909	$76	328,454,535	91,845,825	4,598	8,860,645	1,956,883	9,208,222
New Mexico	1,132,007	75,454,415	$66	132,986,814	31,022,242	1,844	3,772,721	399,926	2,911,078
Region 4									
Idaho - Southern	1,835,607	85,748,612	$46	141,821,705	38,907,754	2,244	4,187,421	1,502,521	5,475,455
Nevada	571,985	60,802,779	$106	96,075,855	26,380,173	1,220	2,952,246	no tax	2,387,787
Utah	1,506,686	87,153,035	$55	172,211,506	43,250,298	2,553	4,248,710	1,971,196	6,319,044
Region 5									
California	6,788,257	551,0[illegible]	$81	1,153,295,534	309,625,360	12,998	33,063,342	4,399,932	34,864,253
Region 6									
Oregon	3,692,252	185,321,641	$63	315,005,386	82,035,273	4,103	no tax	4,480,405	8,537,355
Washington	2,296,632	64,854,994	$28	125,122,027	34,908,055	1,669	4,214,275	no tax	5,941,030

APPENDIX 8 (CONTINUED)

Economic Impacts of Freshwater Fishing on National Forest Lands by State, 1996

Region/State	Forest Service Freshwater Fishing Days	Retail Sales	Expenditures per person per day	Economic Output	Personal Income	FTE Jobs	State Sales Tax	State Income Tax	Federal Income Tax
Region 8									
Alabama	351,167	17,467,212	$47	34,135,311	9,335,953	470	695,689	331,215	893,745
Arkansas	142,042	14,765,703	$51	28,562,589	7,561,020	445	661,757	252,553	696,282
Florida	505,883	33,405,595	$41	61,795,050	17,132,296	822	2,004,236	no tax	1,771,590
Georgia	603,214	48,213,855	$39	98,841,016	26,627,409	1,296	2,928,634	1,169,444	2,774,284
Kentucky	319,748	17,106,104	$54	34,632,747	8,844,260	465	1,026,366	418,303	969,630
Louisiana	281,408	8,191,212	$29	15,270,126	3,997,168	216	324,288	78,696	387,580
Mississippi	120,185	3,555,850	$30	7,193,861	1,867,276	102	248,908	33,071	69,968
North Carolina	978,945	38,513,721	$39	72,041,917	20,567,518	1,000	1,540,546	762,394	1,908,635
Oklahoma	106,993	3,925,653	$33	7,301,124	1,876,120	101	158,054	35,003	175,536
South Carolina	211,559	7,746,020	$37	14,916,644	4,067,758	213	387,501	108,509	340,011
Tennessee	370,731	15,587,634	$42	32,136,307	8,638,858	417	922,222	no tax	855,637
Texas	391,194	16,887,954	$43	35,899,622	10,756,666	517	1,055,497	no tax	1,084,176
Virginia	725,451	46,209,155	$64	91,405,287	24,595,772	1,152	1,617,320	852,931	2,537,220
Region 9									
Illinois	369,245	24,036,536	$70	64,535,450	17,459,425	715	1,755,408	501,300	1,912,921
Indiana	323,110	15,232,832	$47	33,861,150	8,721,269	415	761,641	279,341	886,075
Maine	23,036	730,353	$41	1,320,257	338,105	20	41,805	8,325	51,221
Michigan	5,152,531	289,194,950	$56	497,542,644	137,398,103	6,287	15,362,699	5,345,651	14,305,365
Minnesota	2,969,067	171,930,436	$57	349,336,916	97,262,624	4,358	11,119,576	3,264,598	9,654,100
Missouri	669,975	38,643,410	$44	80,529,693	21,223,902	1,111	1,632,684	672,006	3,076,979
New Hampshire	249,119	13,740,394	$55	26,358,936	6,806,211	335	no tax	26,126	741,894
New York	12,305	402,553	$33	733,031	191,380	8	16,192	3,655	21,519
Ohio	415,017	19,234,027	$46	43,251,065	11,347,257	516	961,701	249,832	1,181,204
Pennsylvania	751,790	21,274,861	$29	44,551,699	12,183,249	564	2,276,492	338,553	1,358,669
Vermont	213,437	11,262,031	$53	19,395,959	5,470,361	301	450,521	136,799	522,547
West Virginia	559,954	20,773,397	$35	31,693,967	9,453,310	461	1,246,341	222,331	635,130
Wisconsin	1,087,217	66,153,971	$61	132,883,470	35,572,656	1,661	3,300,398	1,353,647	3,520,357
Region 10 - Alaska	1,384,738	136,299,717	$80	221,150,167	60,232,392	2,832	no tax	no tax	6,[illegible]

APPENDIX 9

Economic Impacts of Wildlife Viewing on National Forest Lands by State, 1996

Region/State	Forest Service Wildlife Viewing Days	Retail Sales	Expenditures per person per day	Economic Output	Personal Income	FTE Jobs	State Sales Tax	State Income Tax	Federal Income Tax
Region 1									
Idaho - Northern	380,481	15,998,095	$42	27,243,637	7,292,962	420	700,305	252,514	653,972
Montana	1,036,431	45,727,038	$44	85,066,194	22,994,637	1,502	no tax	42,981	2,224,147
North Dakota	81,353	2,729,401	$21	5,233,318	621,653	55	86,470	1,485	82,709
Region 2									
Colorado	4,386,568	140,065,376	$31	309,838,074	88,207,707	4,537	4,301,961	461,911	9,238,217
Kansas	198,336	1,412,455	$7	3,077,119	838,095	47	96,189	20,268	76,474
Nebraska	190,946	2,998,524	$13	4,575,456	1,276,054	51	116,926	35,923	124,799
South Dakota	719,787	35,373,626	$49	66,350,152	28,145,079	1,008	1,424,945	no tax	1,239,785
Wyoming	652,184	46,135,203	$71	81,559,143	22,541,617	1,515	1,845,408	no tax	2,078,447
Region 3									
Arizona	1,952,141	117,915,185	$59	223,589,705	61,144,705	2,756	5,895,919	1,270,186	5,548,786
New Mexico	708,490	82,535,567	$116	146,034,099	36,480,441	2,036	4,125,278	435,227	3,165,975
Region 4									
Idaho - Southern	570,058	23,065,169	$42	40,836,456	10,926,126	699	1,198,418	423,263	979,207
Nevada	112,932	14,885,990	$132	24,534,224	6,392,539	394	967,553	no tax	673,425
Utah	475,070	26,779,462	$56	36,961,503	16,251,968	1,003	1,305,499	766,783	1,756,696
Region 5									
California	7,070,949	237,132,633	$32	507,097,339	141,624,845	5,911	13,627,946	2,156,584	16,999,518
Region 6									
Oregon	2,218,845	91,284,838	$42	176,647,506	46,827,392	2,128	no tax	2,324,240	4,428,725
Washington	3,709,542	218,333,763	$63	415,917,338	108,303,293	4,792	14,317,651	no tax	12,575,342

APPENDIX 9 (CONTINUED)

Economic Impacts of Wildlife Viewing on National Forest Lands by State, 1996

Region/State	Forest Service Wildlife Viewing Days	Retail Sales	Expenditures per person per day	Economic Output	Personal Income	FTE Jobs	State Sales Tax	State Income Tax	Federal Income Tax
Region 8									
Alabama	907,438	42,054,930	$46	82,860,797	22,161,161	1,121	1,612,197	796,984	2,131,039
Arkansas	1,345,430	120,075,361	$93	262,826,913	69,176,401	3,460	5,533,389	1,823,302	5,457,715
Florida	2,038,353	133,694,033	$68	248,023,011	70,034,185	3,395	7,925,641	no tax	3,518,623
Georgia	895,321	29,088,090	$32	63,113,193	18,646,118	942	1,163,958	887,774	2,094,662
Kentucky	692,720	27,292,799	$31	54,769,358	14,195,678	730	1,612,866	656,540	1,364,904
Louisiana	330,799	5,846,535	$26	11,323,441	3,063,243	171	235,455	64,397	316,212
Mississippi	268,010	10,253,471	$61	32,720,739	8,565,310	463	1,144,675	156,791	405,775
North Carolina	2,340,073	45,730,859	$19	85,031,895	23,583,617	1,361	1,745,534	1,038,065	2,598,759
Oklahoma	430,869	4,253,739	$10	5,095,755	2,492,165	146	192,747	54,616	242,165
South Carolina	535,555	29,034,013	$55	54,428,029	14,211,843	816	1,451,601	419,039	1,165,863
Tennessee	956,905	45,141,103	$47	92,077,774	25,865,037	1,355	2,705,478	26,126	2,560,779
Texas	451,795	9,596,537	$21	20,429,079	5,491,426	263	599,354	no tax	550,309
Virginia	2,256,383	51,151,190	$36	159,662,566	44,320,314	2,208	2,859,592	1,205,278	4,845,500
Region 9									
Illinois	1,248,275	13,256,955	$11	20,267,039	8,285,427	350	928,326	549,916	952,651
Indiana	965,516	6,031,658	$11	12,405,752	3,245,654	181	301,583	122,080	387,241
Maine	81,601	4,712,572	$50	8,142,331	2,379,526	51	282,754	62,169	253,160
Michigan	3,466,414	115,534,874	$47	234,255,759	59,256,195	2,602	6,932,092	2,211,937	5,922,837
Minnesota	769,219	13,113,929	$13	23,622,897	7,768,969	392	552,606	321,292	805,549
Missouri	2,682,305	75,170,422	$29	166,257,325	44,257,721	2,155	3,302,700	1,424,566	4,906,945
New Hampshire	1,064,316	34,033,124	$31	61,026,075	17,341,983	956	no tax	no tax	3,148,978
New York	22,951	599,103	$39	1,725,653	458,728	16	35,964	12,650	45,862
Ohio	1,346,990	13,231,652	$10	28,147,221	7,506,999	393	661,583	182,635	899,401
Pennsylvania	960,126	27,568,000	$29	59,385,190	16,615,952	799	1,654,080	461,397	1,715,272
Vermont	835,721	27,023,521	$32	46,647,223	13,052,400	845	1,051,095	366,685	1,400,733
West Virginia	906,099	25,565,790	$32	44,767,268	12,299,505	795	1,540,067	567,227	1,135,625
Wisconsin	1,306,683	47,120,403	$36	93,291,608	25,082,983	1,519	2,356,015	1,065,695	3,009,566
Region 10 - Alaska	752,113	39,655,045	$107	69,754,029	20,582,081	1,041	no tax	no tax	4,212,122

APPENDIX 10

Economic Impacts of Hunting on National Forest Lands by State, 1996

Region/State	Forest Service Hunting Days	Retail Sales	Expenditures per person per day	Economic Output	Personal Income	FTE Jobs	State Sales Tax	State Income Tax	Federal Income Tax
Region 1									
Idaho - Northern	605,687	57,046,060	$61	62,045,445	28,144,229	1,045	2,668,195	691,351	2,695,017
Montana	570,548	58,879,411	$103	106,929,553	39,015,955	1,819	no tax	807,455	3,695,528
North Dakota	126,566	8,596,002	$68	15,021,585	3,922,790	254	559,415	59,138	358,131
Region 2									
Colorado	1,959,227	226,473,201	$126	480,207,789	133,811,875	6,955	10,[illegible]66,561	4,013,253	13,540,058
Kansas	65,962	3,497,659	$53	7,235,746	2,557,364	107	219,356	49,561	288,902
Nebraska	53,042	5,103,526	$96	9,[illegible]53,212	3,464,635	139	436,870	65,535	332,900
South Dakota	123,202	12,737,928	$70	40,679,539	11,570,614	524	1,141,014	no tax	1,013,906
Wyoming	461,205	52,784,533	$117	94,[illegible]8,634	26,033,287	1,664	1,862,671	no tax	2,330,038
Region 3									
Arizona	470,210	62,515,259	$132	121,226,135	36,[illegible]	1,752	3,446,776	764,369	3,654,856
New Mexico	176,023	21,677,268	$154	32,630,335	9,928,815	566	1,083,798	286,347	913,872
Region 4									
Idaho - Southern	997,441	55,502,466	$61	94,454,854	27,163,572	1,560	3,091,464	3,050,736	2,539,477
Nevada	51,390	9,549,143	$190	15,961,837	4,656,921	216	686,788	no tax	490,724
Utah	795,919	80,642,306	$101	154,225,343	46,571,670	2,583	4,512,886	1,930,172	4,441,989
Region 5									
California	1,742,145	185,720,449	$105	392,852,526	15,971,669	4,86[illegible]	17,925,303	1,353,227	12,599,926
Region 6									
Oregon	1,389,532	150,464,043	$117	284,118,602	73,617,453	1,523	no tax	4,004,814	7,560,294
Washington	1,528,462	99,704,915	$65	187,373,201	53,120,352	2,560	3,497,677	no tax	5,649,072

APPENDIX 10 (CONTINUED)

Economic Impacts of Hunting on National Forest Lands by State, 1996

Region/State	Forest Service Hunting Days	Retail Sales	Expenditures per person per day	Economic Output	Personal Income	FTE Jobs	State Sales Tax	State Income Tax	Federal Income Tax
Region 8									
Alabama	792,971	66,163,355	$87	131,127,869	36,019,752	1,759	3,959,964	1,357,921	3,656,254
Arkansas	1,597,219	64,447,527	$45	124,591,682	36,544,386	1,920	3,983,496	1,206,634	3,445,002
Florida	87,627	5,239,357	$60	9,849,785	3,144,620	150	317,758	no tax	324,199
Georgia	366,384	43,774,758	$119	82,191,349	25,178,218	1,103	2,[illegible]932	1,125,735	2,096,214
Kentucky	501,613	16,643,578	$33	34,009,356	9,506,502	515	1,058,035	549,686	919,955
Louisiana	419,038	23,547,653	$56	42,877,161	12,067,622	637	1,238,369	240,698	1,184,430
Mississippi	719,308	28,466,672	$41	75,688,373	20,297,586	1,145	3,092,148	558,565	1,915,525
North Carolina	949,016	43,521,406	$46	84,269,268	23,566,267	1,129	2,341,896	970,145	2,425,263
Oklahoma	206,524	16,065,762	$77	34,239,571	9,210,715	409	801,282	210,468	895,248
South Carolina	438,625	20,669,051	$47	38,558,604	12,680,682	637	1,170,057	311,708	1,113,978
Tennessee	628,892	44,691,395	$71	95,443,851	26,345,474	1,267	3,012,706	no tax	2,706,536
Texas	138,265	8,941,846	$65	20,458,912	5,803,534	281	623,077	no tax	582,526
Virginia	832,451	53,475,019	$64	156,245,705	43,967,480	2,164	3,357,875	1,258,860	4,469,274
Region 9									
Illinois	256,042	17,279,021	$68	29,[illegible]	11,459,663	493	1,152,710	328,936	1,232,159
Indiana	294,650	12,350,373	$42	25,157,245	7,561,460	364	542,785	244,506	731,372
Maine	55,809	4,261,348	$76	7,222,401	2,063,503	112	297,305	13,896	169,255
Michigan	2,432,118	150,155,892	$54	347,079,934	70,034,982	3,255	8,629,557	2,727,838	7,109,461
Minnesota	981,515	65,310,213	$67	131,937,718	36,786,643	1,892	4,674,533	1,197,716	3,744,297
Missouri	759,815	56,060,155	$74	130,753,851	32,957,271	1,753	3,949,364	579,886	3,255,424
New Hampshire	355,447	17,444,846	$45	32,361,590	9,635,667	459	no tax	no tax	971,012
New York	5,307	597,570	$61	999,574	249,049	10	21,343	7,285	55,716
Ohio	756,678	57,591,555	$50	52,855,550	25,249,158	1,116	2,151,245	1[illegible],351	2,347,152
Pennsylvania	566,535	30,053,604	$53	57,560,579	18,543,552	815	1,521,532	513,759	1,951,645
Vermont	316,535	20,601,753	$65	36,482,154	10,754,456	555	906,859	366,029	1,354,114
West Virginia	642,586	25,170,094	$36	39,313,550	10,835,382	616	1,569,664	333,574	1,107,272
Wisconsin	1,754,231	85,989,025	$49	167,109,696	48,855,019	2,655	5,266,424	1,843,787	4,713,015
Region 10 - Alaska	526,342	29,030,148	$153	62,476,038	22,052,568	1,126	no tax	no tax	2,879,951

APPENDIX 11

Economic Impacts of Big Game Hunting on National Forest Lands by State, 1996

Region/State	Forest Service Big Game Hunting Days	Retail Sales	Expenditures per person per day	Economic Output	Personal Income	FTE Jobs	State Sales Tax	State Income Tax	Federal Income Tax
Region 1									
Idaho - Northern	386,687	22,309,934	$58	37,341,563	6,536,942	561	1,790,215	621,608	1,006,565
Montana	497,347	35,844,632	$55	70,084,869	20,408,115	1,360	1,316,870	481,985	1,725,075
North Dakota	46,164	1,280,481	$71	5,638,952	1,605,610	97	212,071	20,410	145,831
Region 2									
Colorado	1,427,247	277,570,014	$195	581,534,135	164,690,705	8,087	11,651,560	5,599,324	36,797,621
South Dakota	128,699	6,653,264	$52	11,269,506	3,172,762	192	301,369	0	287,131
Wyoming	406,062	29,774,692	$73	51,755,399	13,474,595	850	1,497,854	0	1,206,006
Region 3									
Arizona	130,068	26,520,054	$156	49,791,664	15,137,070	756	1,525,160	320,239	1,527,447
New Mexico	77,315	11,990,601	$150	21,011,961	5,778,774	349	650,674	164,232	524,143
Region 4									
Idaho - Southern	579,635	33,514,667	$58	56,594,424	15,750,662	935	2,652,108	636,149	1,508,636
Utah	442,961	44,745,183	$101	91,241,197	25,613,252	1,410	2,807,215	1,066,972	2,456,362
Region 5									
California	803,598	51,960,690	$64	11[illegible],369,318	31,591,177	1,339	4,182,255	368,991	3,433,740
Region 6									
Oregon	969,912	128,189,925	$132	235,455,506	66,125,808	2,776	2,065,131	3,346,295	6,291,869
Washington	936,[illegible]	48,615,24[illegible]	$52	91,753,636	26,719,314	1,182	4,918,162	0	2,816,553

APPENDIX 11 (CONTINUED)

Economic Impacts of Big Game Hunting on National Forest Lands by State, 1996

Region/State	Forest Service Big Game Hunting Days	Retail Sales	Expenditures per person per day	Economic Output	Personal Income	FTE Jobs	State Sales Tax	State Income Tax	Federal Income Tax
Region 8									
Arkansas	656,056	30,959,660	$47	50,239,208	16,958,172	565	1,508,213	559,020	1,588,347
Mississippi	315,281	12,180,749	$55	35,954,309	9,047,752	506	1,026,930	244,839	865,772
Tennessee	400,549	30,847,850	$73	60,531,736	15,238,677	539	2,064,051	0	1,932,270
Virginia	827,362	63,705,155	$77	124,175,707	34,294,014	1,622	2,900,315	1,005,388	3,550,806
Region 9									
Maine	32,435	2,379,663	$73	4,022,361	1,134,028	60	175,611	63,090	121,336
Michigan	1,405,317	52,998,990	$36	95,749,909	28,595,550	1,509	3,806,094	1,119,520	2,929,177
Minnesota	565,255	34,850,027	$96	69,117,920	19,217,806	893	2,942,914	802,225	2,905,563
New Hampshire	229,615	5,036,601	$35	14,582,346	4,425,864	220	146,305	0	441,361
New York	5,497	278,440	$51	501,055	135,717	8	12,168	4,219	15,512
Pennsylvania	410,397	19,390,354	$47	35,262,710	11,151,252	503	934,921	312,291	1,176,408
Vermont	161,245	9,130,519	$57	16,731,845	4,793,179	251	454,675	118,242	472,169
West Virginia	619,965	28,736,565	$46	48,259,979	13,423,334	759	2,031,308	405,955	1,287,327
Wisconsin	750,688	42,011,113	$56	81,490,464	23,715,371	1,335	2,799,266	904,739	2,305,601
Region 10									
Alaska	336,090	18,294,426	$81	28,749,342	6,958,251	319	211,874	0	753,738

*Estimates are calculated for states where there were more than 30 observations of big game hunting on public lands

APPENDIX 12

Economic Impacts of Small Game Hunting on National Forest Lands by State, 1996

Region/State	Forest Service Small Game Hunting Days	Retail Sales	Expenditures per person per day	Personal Income	Total Jobs	State Sales Tax	State Income Tax	Federal Income Tax
Region 1								
Montana	121,545	1,071,458	$25	1,525,633	59	222,130	39,770	132,774
North Dakota	34,241	1,053,336	$34	537,095	32	65,667	6,806	43,055
Region 2								
Nebraska	39,999	750,200	$25	1,[illegible]	27	70,465	9,639	33,918
South Dakota	149,436	3,339,773	$65	4,905,337	313	422,525	0	224,299
Region 3								
Arizona	165,525	7,477,895	$44	13,932,693	195	300,551	83,545	398,755
Region 4								
Nevada	21,022	1,261,709	$60	2,302,845	27	115,500	0	58,500
Utah	256,459	13,[illegible]	$55	20,368,05[illegible]	404	588,599	299,463	697,359
Region 8								
Mississippi	309,[illegible]0	5,[illegible]81	$25	10,742,285	260	347,601	64,101	240,355
Region 9								
Minnesota	368,946	26,[illegible]18	$14	32,[illegible]16	442	1,[illegible]072	135,076	838,791
Pennsylvania	144,[illegible]	[illegible]	$13	9,854,139	46	56,752	30,100	116,885
Wisconsin	459,154	9,253,542	$26	2,[illegible]	292	2,[illegible]06	91,513	402,[illegible]

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