U.S. Fish & Wildlife Service

2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation

Michigan

FHW/11-MI (RV)
Revised October 2018

2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation

Michigan

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The U.S. Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated Island Communities. The mission of the Department's U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, and their habitats for the continuing benefit of the American people. The Service is responsible for national programs of vital importance to our natural resources, including administration of the Wildlife and Sport Fish Restoration Programs. These two programs provide financial assistance to the States for projects to enhance and protect fish and wildlife resources and to assure their availability to the public for recreational purposes. Multistate grants from these programs fund the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.

Suggested Citation

U.S. Department of the Interior, U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.

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Foreword

When I was growing up, it was taken as a matter of faith that kids belonged outside. I grew up with 4 brothers, and during those long, hot Atlanta summers, it was common for our mom to holler, "You boys get outside, and don't come back 'til it's dark." It never occurred to me or my brothers to do anything else in our spare time but explore the world around us. The truth is, we had little else to do. But those experiences – waking up on frosty mornings and starting the campfire, scanning trees for a shot at a scampering gray squirrel in the dawn light, scouring creek beds for crawdads and other fishing bait, or simply of the fun we had tramping through the forest – shaped who I am, and drew me to a career in conservation.

That's why I'm excited by this 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. This report, the 12th in a series that began in 1955, documents a significant resurgence in the number of people embracing America's Great Outdoors. Hunting participation has increased by 9 percent, while angling participation grew by 11 percent. Nearly 38 percent of Americans participated in wildlife-related recreation, an increase of 2.6 million participants from the 2006 Survey.

In addition, wildlife-related recreation is a major driver of the nation's economy. The 2011 Survey estimates that Americans spent $145 billion on related gear, trips, licenses, land acquisition or leases, and other purchases, representing about one percent of the nation's gross domestic product. This spending creates thousands of jobs, supports countless local communities and provides vital funding for conservation.

This year marks the 75th anniversary of the Wildlife and Sport Fish Restoration Program, a cornerstone of wildlife conservation in the United States. Through excise taxes on firearms, ammunition, archery and angling equipment, the U.S. Fish and Wildlife Service has distributed over $14 billion for State and territorial wildlife conservation programs.

This report would not have been possible without the combined efforts of state wildlife agencies – which provided financial support through the Multi-State Conservation Grant Programs – the Association of Fish and Wildlife Agencies and a number of major national conservation organizations. We also owe our gratitude to the thousands of survey respondents from households across America. Because of you, this Survey is the nation's definitive wildlife-related recreation database and information source concerning participation and purchases associated with hunting, fishing and other forms of wildlife-associated recreation nationwide.

The Fish and Wildlife Service is dedicated to connecting people and families with nature. We are proud to celebrate the good news in this report, and we look forward to continuing progress as we work with the States, and all our partners and the public to help keep recreational fishing, hunting, and wildlife watching growing and going strong.

Dan Ashe
Director, U.S. Fish and Wildlife Service

Survey Background and Method

The National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (Survey) has been conducted since 1955 and is one of the oldest and most comprehensive continuing recreation surveys. The Survey collects information on the number of anglers, hunters, and wildlife watchers, how often they participate, and how much they spend on their activities in the United States.

Preparations for the 2011 Survey began in 2008 when the Association of Fish and Wildlife Agencies (AFWA) asked the Fish and Wildlife Service to coordinate the twelfth National Survey of wildlife-related recreation. Funding came from the Multistate Conservation Grant Programs, authorized by Wildlife and Sport Fish Restoration Acts, as amended.

Four regional technical committees were set up under the auspices of AFWA to ensure that State fish and wildlife agencies had an opportunity to participate in all phases of survey planning and design. The committees were made up of agency representatives.

We consulted with State and Federal agencies and nongovernmental organizations such as the American Sportfishing Association and National Shooting Sports Foundation to determine survey content. Other sportspersons' organizations and conservation groups, industry representatives, and researchers also provided valuable advice.

Data collection for the Survey was carried out in two phases by the U.S. Census Bureau. The first phase was the screen which began in April 2011. During the screening phase, the Census Bureau interviewed a sample of 48,600 households nationwide, to determine who in the household had fished, hunted, or wildlife watched in 2010, and who had engaged or planned to engage in those activities in 2011. In most cases, one adult household member provided information for all members. The screen primarily covered 2010 activities while the next, more in-depth phase covered 2011 activities. For more information on the 2010 data, refer to Appendix B.

The second phase of data collection consisted of three detailed interview waves. The first wave began in April 2011 concurrent with the screen, the second in September 2011, and the last in January 2012. Interviews were conducted with samples of likely anglers, hunters, and wildlife watchers who were identified in the initial screening phase. Interviews were conducted primarily by telephone, with in-person interviews for respondents who could not be reached by phone. Respondents in the second survey phase were limited to those who were at least 16 years old. Each respondent provided information pertaining only to his or her activities and expenditures. Sample sizes were designed to provide statistically reliable results at the state level. Altogether, interviews were completed for 11,330 anglers and hunters and 9,329 wildlife watchers. More detailed information on sampling procedures and response rates is found in Appendix D.

Comparability With Previous Surveys

The 2011 Survey's questions and methodology were similar to those used in the 2006, 2001, 1996, and 1991 Surveys. Therefore, the estimates are comparable.

The methodology for these Surveys differs significantly from the 1955 to 1985 Surveys, so these estimates are not directly comparable to those of earlier surveys. Changes in methodology included reducing the recall period over which respondents had to report their activities and expenditures. Previous Surveys used a 12-month recall period which resulted in greater reporting bias. Research found that the amount of activity and expenditures reported in 12-month recall surveys was overestimated in comparison with that reported using shorter recall periods.

Highlights

Introduction

The National Survey of Fishing, Hunting, and Wildlife-Associated Recreation reports results from interviews with U.S. residents about their fishing, hunting, and wildlife watching. This report focuses on 2011 participation and expenditures of persons 16 years of age and older.

The Survey is a snapshot of one year. The information it collected tells us how many people participated and how much they spent on their activities in the State in 2011. It does not tell us how many anglers, hunters, and wildlife watchers there were because many do not participate every year. For example, based on information collected in the Survey's household screen phase, we can estimate that about 51 percent more anglers and 44 percent more hunters participated nationally in at least 1 of the 5 years prior to the screen survey year 2010.

In addition to 2011 estimates, we also provide trend information in the Highlights section and Appendix C of the report. The 2011 numbers reported can be compared with those in the 1991, 1996, 2001, and 2006 Survey reports because they used similar methodologies. The 2011 estimates should not be directly compared with results from Surveys conducted prior to 1991 because of changes in methodology to improve accuracy.

The report also provides information on participation in wildlife recreation in 2010, particularly of persons 6 to 15 years of age. The 2010 information is provided in Appendix B. Information about the Survey's scope and coverage is in Appendix D. The remainder of this section defines important terms used in the Survey.

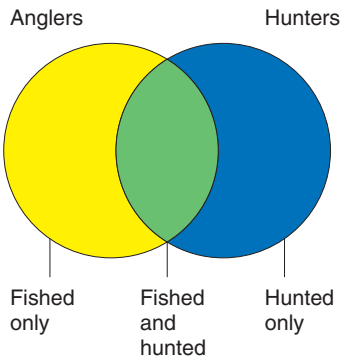
This report does not provide information about the State's wildlife resources. That, and additional information on wildlife-related recreation, may be obtained from State fish and wildlife agencies. The Association of Fish and Wildlife Agencies can provide the addresses and telephone numbers of those agencies. The Association's website is www.fishwildlife.org.

Additionally, this report does not provide information about the State's number of licensed anglers and hunters. Historical license data can be found at wsfrprograms.fws.gov.

Wildlife-Related Recreation

Wildlife-related recreation is fishing, hunting, and wildlife-watching activities. These categories are not mutually exclusive because many individuals participated in more than one activity. Wildlife-related recreation is reported in two major categories: (1) fishing and hunting, and (2) wildlife watching, which includes observing, photographing, and feeding fish or wildlife.

Sportspersons



Fishing and Hunting

This Survey reports information about residents of the United States who fished or hunted in 2011, regardless of whether they were licensed. The fishing and hunting sections report information for three groups: (1) sportspersons, (2) anglers, and (3) hunters.

Sportspersons

Sportspersons are those who fished or hunted. Individuals who fished or hunted commercially in 2011 are reported as sportspersons *only* if they also fished or hunted for recreation. The sportspersons group is composed of the three subgroups shown in the diagram below: (1) those that fished and hunted, (2) those that only fished, and (3) those that only hunted.

The total number of sportspersons is equal to the sum of people who only fished, only hunted, and both hunted and fished. It is not the sum of all anglers and all hunters because those people who both fished and hunted are included in both the angler and hunter population and would be incorrectly counted twice.

Anglers

Anglers are sportspersons who only fished plus those who fished and hunted. Anglers include not only licensed hook and line anglers, but also those who have no license and those who use special methods such as fishing with spears. Three types of fishing are reported: (1) freshwater, excluding the Great Lakes, (2) Great Lakes, and (3) saltwater. Since many anglers participated in more than one type of fishing, the total number of anglers is less than the sum of the three types of fishing.

Hunters

Hunters are sportspersons who only hunted plus those who hunted and fished. Hunters include not only licensed hunters using rifles and shotguns, but also those who have no license and those who engage in hunting with archery equipment, muzzleloaders, other primitive firearms, or pistols or handguns.

Four types of hunting are reported: (1) big game, (2) small game, (3) migratory bird, and (4) other animals. Since many hunters participated in more than one type of hunting, the sum of hunters for big game, small game, migratory bird, and other animals exceeds the total number of hunters.

Wildlife Watchers

Since 1980, the National Survey has included information on wildlife-watching activities in addition to fishing and hunting. However, unlike the 1980 and 1985 Surveys, the National Surveys since 1991 have collected data only for those activities where the *primary* purpose was wildlife watching (observing, photographing, or feeding wildlife).

The 2011 Survey uses a strict definition of wildlife watching. Participants must either take a "special interest" in wildlife around their homes or take a trip for the "primary purpose" of wildlife watching. Secondary wildlife watching, such as incidentally observing wildlife while pleasure driving, is not included.

Two types of wildlife-watching activity are reported: (1) away-from-home (formerly nonresidential) activities and (2) around-the-home (formerly residential) activities. Because some people participated in more than one type of wildlife watching, the sum of participants in each type will be greater than the total number of wildlife watchers. Only those engaged in activities whose *primary* purpose was wildlife watching are included in the Survey. The two types of wildlife-watching activity are defined below.

Away-From-Home

This group includes persons who took trips or outings of at least 1 mile from home for the primary purpose of observing, feeding, or photographing fish and wildlife. Trips to fish or hunt or scout and trips to zoos, circuses, aquariums, and museums are not considered wildlife-watching activities.

Around-The-Home

This group includes those who participated within 1 mile of home and involves one or more of the following: (1) closely observing or trying to identify birds or other wildlife; (2) photographing wildlife; (3) feeding birds or other wildlife; (4) maintaining natural areas of at least 1/4 acre where benefit to wildlife is the primary concern; (5) maintaining plantings (shrubs, agricultural crops, etc.) where benefit to wildlife is the primary concern; or (6) visiting parks and natural areas within 1 mile of home for the primary purpose of observing, feeding, or photographing wildlife.

2011 Michigan Summary

Activities in Michigan by Residents and Nonresidents

Fishing

Anglers	**1,744,000**
Days of fishing	28,177,000
Average days per angler	16
Total expenditures	$2,427,110,000
Trip-related	$1,092,735,000
Equipment and other	$1,334,375,000
Average per angler	$1,375
Average trip expenditure per day	$39

Hunting

Hunters	**529,000**
Days of hunting	11,020,000
Average days per hunter	21
Total expenditures	$2,338,684,000
Trip-related	$271,341,000
Equipment and other	$2,067,343,000
Average per hunter	$4,409
Average trip expenditure per day	$25

Wildlife Watching

Total wildlife-watching participants	**3,199,000**
Away-from-home participants	958,000
Around-the-home participants	2,865,000
Days of participation away from home	10,343,000
Average days of participation away from home	11
Total expenditures	$1,220,816,000
Trip-related	$416,562,000
Equipment and other	$804,254,000
Average per participant	$369
Average trip expenditure per day	$40

Activities by Michigan Residents Both Inside and Outside Michigan

Fishing

Anglers	**1,465,000**
Days of fishing	26,744,000
Average days per angler	18
Total expenditures	$2,300,485,000
Trip-related	$904,680,000
Equipment and other	$1,395,805,000
Average per angler	$1,570
Average trip expenditure per day	$34

Hunting

Hunters	**507,000**
Days of hunting	11,358,000
Average days per hunter	22
Total expenditures	$2,514,885,000
Trip-related	$446,539,000
Equipment and other	$2,068,346,000
Average per hunter	$4,958
Average trip expenditure per day	$39

Wildlife Watching

Total wildlife-watching participants	**3,067,000**
Away-from-home participants	855,000
Around-the-home participants	2,865,000
Days of participation away from home	10,418,000
Average days of participation away from home	12
Total expenditures	$1,231,400,000
Trip-related	$390,960,000
Equipment and other	$840,440,000
Average per participant	$401
Average trip expenditure per day	$38

Wildlife-Related Recreation

Participation in Michigan

The 2011 Survey found that 4.4 million Michigan residents and nonresidents 16 years old and older fished, hunted, or wildlife watched in Michigan. Of the total number of participants, 1.7 million fished, 529 thousand hunted, and 3.2 million participated in wildlife-watching activities, which includes observing, feeding, and photographing wildlife. The sum of anglers, hunters, and wildlife watchers exceeds the total number of participants in wildlife-related recreation because many of the individuals engaged in more than one wildlife-related activity.

Participation in 2011 by 6- to 15-Year-Old Michigan Residents

The focus of the National Survey is on the activity of participants 16 years old and older. However, the activity of 6- to 15-year-olds can be calculated using the screening data covering the year 2010. It is assumed for estimation purposes that the proportion of 6- to 15-year-old participants to participants 16 years old and older remained the same in 2010 and 2011. Based on this assumption, in addition to the 1.5 million resident anglers 16 years old or older in Michigan, there were 323 thousand resident anglers 6 to 15 years old. Also, there were 507 thousand Michiganders 16 years old and older and 110 thousand Michiganders 6 to 15 years old who hunted. Finally, there were 3.1 million Michiganders 16 years old and older and 374 thousand Michiganders 6 to 15 years old who wildlife watched. Information on 2010 data for 6- to 15-year-olds is provided in Appendix B.

Expenditures in Michigan

In 2011, state residents and nonresidents spent $6.1 billion on wildlife recreation in Michigan. Of that total, trip-related expenditures were $1.8 billion and equipment expenditures totaled $3.2 billion. The remaining $1.1 billion was spent on licenses, contributions, land ownership and leasing, and other items.

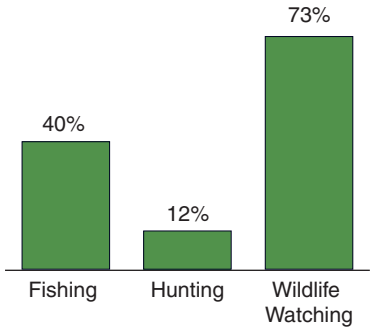
Participants in Wildlife-Related Recreation in Michigan: 2011
(U.S. residents 16 years old and older)

Total	**4.4 million**
Sportspersons	
Total	**1.9 million**
Anglers	1.7 million
Hunters	529 thousand
Wildlife Watchers	
Total	**3.2 million**
Away from home	958 thousand
Around the home	2.9 million

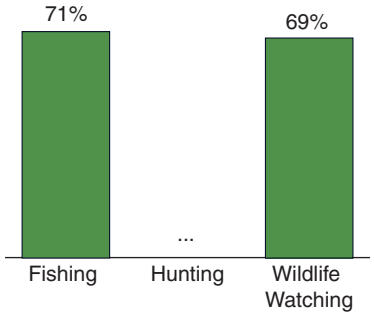
Note: Detail does not add to total because of multiple responses.

Source: Tables 1 and 24.

Percent of Total Participants by Activity
(Total: 4.4 million participants)



Percent of Total Residential Participants 6 to 15 Years Old by Activity: 2010
(Total: 600 thousand participants)



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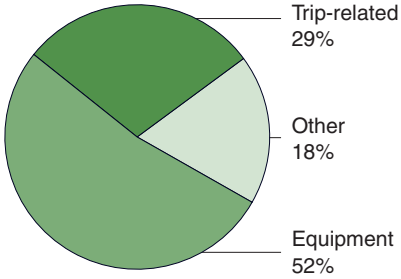
Wildlife-Related Recreation Expenditures in Michigan
(Total: $6.1 billion)



Sportspersons

In 2011, 1.9 million state resident and nonresident sportspersons 16 years old and older fished or hunted in Michigan. This group was comprised of 1.7 million anglers (90 percent of all sportspersons) and 529 thousand hunters (27 percent of all sportspersons). Among the 1.9 million sportspersons who fished or hunted in the state, 1.4 million (73 percent) fished but did not hunt in Michigan. Another 194 thousand (10 percent) hunted but did not fish there. The remaining 335 thousand (17 percent) fished and hunted in Michigan in 2011.

Sportspersons' Participation in Michigan

(State residents and nonresidents 16 years old and older)

Sportspersons (fished or hunted)	**1.9 million**
Anglers	**1.7 million**
Fished only	1.4 million
Fished and hunted	335 thousand
Hunters	**529 thousand**
Hunted only	194 thousand
Hunted and fished	335 thousand

Note: Detail does not add to total because of multiple responses.

Source: Table 1.

Anglers

Participants and Days of Fishing

In 2011, 1.7 million state residents and nonresidents 16 years old and older fished in Michigan. Of this total, 1.4 million anglers (80 percent) were state residents and 347 thousand anglers (20 percent) were nonresidents. Anglers fished a total of 28.2 million days in Michigan—an average of 16 days per angler. State residents fished 26.0 million days—92 percent of all fishing days in Michigan. Nonresidents fished 2.2 million days in Michigan—8 percent of all fishing days in the state.

A large majority of Michigan residents who fished anywhere in the United States did so in their resident state. There were 1.5 million Michigan residents 16 years old and older who fished in the United States in 2011 for a total of 26.7 million days. An estimated 95 percent of all Michigan residents who fished did so in their home state. Of all fishing days by Michigan residents, 97 percent or 26.0 million were in their home state. For further details about fishing in Michigan, see Table 3.

Anglers in Michigan

(State residents and nonresidents 16 years old and older)

Anglers	**1.7 million**
Residents	1.4 million
Nonresidents	347 thousand
Days of fishing	**28.2 million**
Residents	26.0 million
Nonresidents	2.2 million

Source: Table 3.

In State/Out of State

(State residents 16 years old and older)

Michigan anglers	**1.5 million**
In Michigan	1.4 million
In other states	200 thousand
Days of fishing	**26.7 million**
In Michigan	26.0 million
In other states	730 thousand

Note: Detail does not add to total because of multiple responses.

Source: Table 3.

Fishing Expenditures in Michigan

All fishing-related expenditures in Michigan totaled $2.4 billion in 2011. Trip-related expenditures, including food and lodging, transportation, and other expenses totaled $1.1 billion—45 percent of all fishing expenditures. Expenditures for food and lodging were $374 million and transportation expenditures were $344 million. Other trip expenses, such as equipment rental, bait, and cooking fuel, totaled $374 million. Each angler spent an average of $624 on trip-related costs during 2011.

Anglers spent $1.1 billion on equipment in Michigan in 2011, 46 percent of all fishing expenditures. Fishing equipment (rods, reels, lines, etc.) spending totaled $259 million—23 percent of the equipment total. Auxiliary equipment expenditures (tents, special fishing clothing, etc.) and special equipment expenditures (boats, vans, etc.) amounted to $859 million—77 percent of the equipment total. Expenditures classified as special and auxiliary equipment are on items that were purchased for fishing but could be used in activities other than fishing.

The purchase of other items, such as magazines, membership dues, licenses, permits, stamps, and land leasing and ownership, amounted to $216 million—9 percent of all fishing expenditures. For more details about fishing expenditures in Michigan, see Tables 19 and 21 through 23.

Fishing Expenditures in Michigan

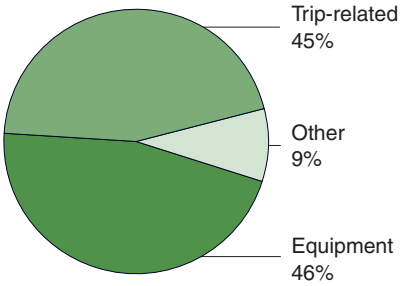
(State residents and nonresidents 16 years old and older)

Total	**$2.4 billion**
Trip-related	$1.1 billion
Equipment	$1.1 billion
Fishing	$259 million
Auxiliary and special	$859 million
Other	$216 million

Source: Table 19.

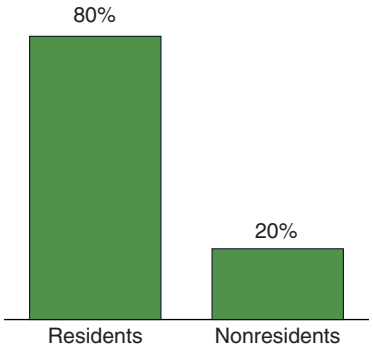
Fishing Expenditures in Michigan

(Total: $2.4 billion)

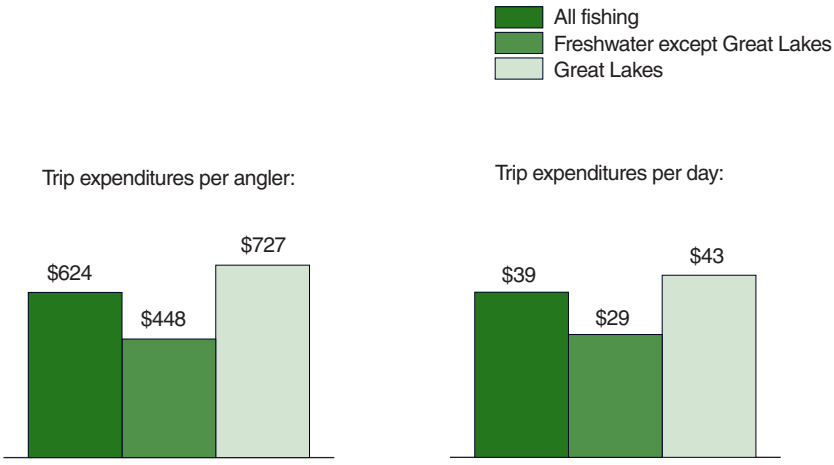


Percent of Anglers by Residence

(Total: 1.7 million participants)



Comparative Fishing Expenditures by Type of Fishing



Hunters

Participants and Days of Hunting

In 2011, there were 529 thousand residents and nonresidents 16 years old and older who hunted in Michigan. Resident hunters numbered 501 thousand, accounting for 95 percent of the hunters in Michigan. Residents and nonresidents hunted 11.0 million days in 2011, an average of 21 days per hunter. Residents hunted 10.8 million days in Michigan or 98 percent of all hunting days.

There were 507 thousand Michigan residents 16 years old and older who hunted in the United States in 2011 for a total of 11.4 million days. An estimated 99 percent of all Michigan residents who hunted did so in their home state. Of all hunting days by Michigan residents, 95 percent or 10.8 million were spent pursuing game in their home state. For further information on hunting activities by Michigan residents, see Table 3.

Hunters in Michigan

(State residents and nonresidents 16 years old and older)

Hunters	**529 thousand**
Residents	501 thousand
Nonresidents	...
Days of hunting	**11.0 million**
Residents	10.8 million
Nonresidents	...

… Sample size too small (less than 10) to report data reliably.

Source: Table 3.

In State/Out of State

(State residents 16 years old and older)

Michigan hunters	**507 thousand**
In Michigan	501 thousand
In other states	...
Days of hunting	**11.4 million**
In Michigan	10.8 million
In other states	...

… Sample size too small (less than 10) to report data reliably.

Source: Table 3.

Hunting Expenditures in Michigan

All hunting-related expenditures in Michigan totaled $2.3 billion in 2011. Trip-related expenses, such as food and lodging, transportation, and other trip expenses, totaled $271 million—12 percent of total expenditures. Expenditures for food and lodging were $105 million and transportation expenditures were $144 million. Other trip expenses, such as equipment rental, totaled $22 million for the year. The average trip-related expenditure per hunter was $513.

Hunters spent $1.3 billion on equipment—56 percent of all hunting expenditures. Hunting equipment (guns, ammunition, etc.) totaled $408 million and made up 31 percent of all equipment costs. Hunters spent $909 million on auxiliary equipment (tents, special hunting clothes, etc.) and special equipment (boats, vans, etc.), accounting for 69 percent of total equipment expenditures for hunting. Expenditures classified as special and auxiliary equipment are on items that were purchased for hunting but could be used in activities other than hunting.

The purchase of other items, such as magazines, membership dues, licenses, permits, and land leasing, and ownership, cost hunters $750 million—32 percent of all hunting expenditures. For more details on hunting expenditures in Michigan, see Tables 20 through 23.

Hunting Expenditures in Michigan

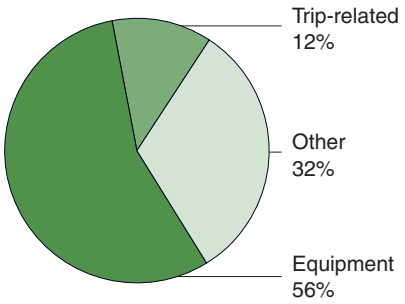
(State residents and nonresidents 16 years old and older)

Total	**$2.3 billion**
Trip-related	$271 million
Equipment	$1.3 billion
Hunting	$408 million
Auxiliary and special	$909 million
Other	$750 million

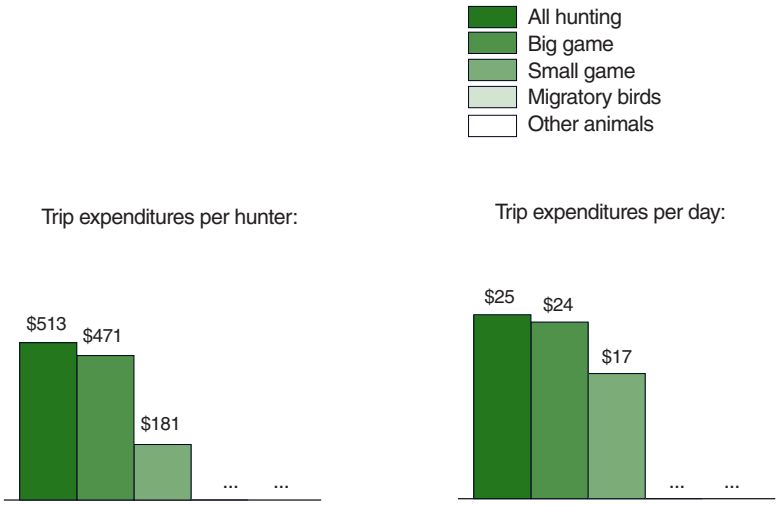
Source: Table 20.

Hunting Expenditures in Michigan

(Total: $2.3 billion)



Comparative Hunting Expenditures by Type of Hunting



... Sample size too small (less than 10) to report data reliably.

Wildlife Watchers

Participants and Days of Activity

In 2011, 3.2 million U.S. residents 16 years old and older fed, observed, or photographed wildlife in Michigan. Most of them, 90 percent (2.9 million), enjoyed their activities close to home and are called "around-the-home" participants. Those persons who enjoyed wildlife at least one mile from home are called "away-from-home" participants. People participating in away-from-home activities in Michigan in 2011 numbered 958 thousand—30 percent of all wildlife watchers in Michigan. Of the 958 thousand, 790 thousand were state residents and 168 thousand were nonresidents.

Wildlife-Watching Participants in Michigan
(State residents and nonresidents 16 years old and older)

Total	**3.2 million**
Around the home	2.9 million
Away from home	958 thousand

Note: Detail does not add to total because of multiple responses.
Source: Table 24.

Away-From-Home Wildlife-Watching Participation in Michigan
(State residents and nonresidents 16 years old and older)

Participants, total	**958 thousand**
Observe wildlife	950 thousand
Photograph wildlife	608 thousand
Feed wildlife	252 thousand
Days, total	**10.3 million**
Observe wildlife	9.0 million
Photograph wildlife	5.3 million
Feed wildlife	2.4 million

Note: Detail does not add to total because of multiple responses.
Source: Table 25.

Around-The-Home Wildlife-Watching Participation in Michigan
(State residents 16 years old and older)

Total	**2.9 million**
Feed wildlife	2.3 million
Observe wildlife	1.7 million
Photograph wildlife	1.7 million
Maintain natural areas	248 thousand
Maintain plantings	239 thousand
Visit parks and natural areas	402 thousand

Note: Detail does not add to total because of multiple responses.
Source: Table 27.

Michiganders 16 years old and older who enjoyed away-from-home wildlife watching within their state totaled 790 thousand. Of this group, 790 thousand participants observed wildlife and 507 thousand photographed wildlife. Since some individuals engaged in more than one of the away-from-home activities during the year, the sum of wildlife observers, feeders, and photographers exceeds the total number away-from-home participants.

Michiganders spent 9.5 million days engaged in away-from-home wildlife-watching activities in their state. They spent 8.6 million days observing and 4.9 million days photographing wildlife. For further details about away-from-home activities, see Table 25.

Michigan residents also took an active interest in wildlife around their homes. In 2011, 2.9 million state residents enjoyed observing, feeding, and photographing wildlife within one mile of their homes. Among this around-the-home group, 2.3 million fed, 1.7 million observed, and 1.7 million photographed wildlife around their homes. Another 248 thousand participants maintained natural areas of one-quarter acre or more for wildlife; 239 thousand participants maintained plantings for the benefit of wildlife; and 402 thousand participants visited parks or natural areas within a mile of home because of the wildlife. Summing the number of participants in these six activities results in an estimate that exceeds the total number of around-the-home participants because many people participated in more than one type of around-the-home activity. In addition, 23 percent of Michigander around-the-home wildlife watchers also enjoyed wildlife away from home. For further details about Michigan residents participating in around-the-home wildlife-watching activities, see Table 27.

Wild Bird Observers

Bird watching attracted many wildlife enthusiasts in Michigan. In 2011, 2.0 million people observed birds around the home and on trips in the state. A majority, 78 percent (1.6 million), observed wild birds around the home while 41 percent (818 thousand) took trips away from home to watch birds.

Wild Bird Observers in Michigan

(State residents and nonresidents 16 years old and older)

Participants, total	**2.0 million**
Around the home	1.6 million
Away from home	818 thousand
Days, total	**212.2 million**
Around the home	204.3 million
Away from home	7.9 million

Note: Detail does not add to total because of multiple responses.

Source: Table 29.

Wildlife-Watching Expenditures in Michigan

Wildlife watchers spent $1.2 billion on wildlife-watching activities in Michigan in 2011. Trip-related expenditures, including food and lodging ($233 million), transportation ($152 million), and other trip expenses ($32 million), such as equipment rental, amounted to $417 million. This summation comprised 34 percent of all wildlife-watching expenditures by participants. The average of the trip-related expenditures for away-from-home participants was $425 per person in 2011.

Wildlife-watching participants spent nearly $663 million on equipment—54 percent of all their expenditures. Specifically, wildlife-watching equipment (binoculars, special clothing, etc.) expenditures totaled $429 million, 65 percent of the equipment total. Auxiliary equipment expenditures (tents, backpacking equipment, etc.) and special equipment expenditures (campers, trucks, etc.) amounted to $234 million—35 percent of all equipment costs. Expenditures classified as special and auxiliary equipment are on items that were purchased for wildlife-watching recreation but could be used in activities other than wildlife watching.

Other items purchased by wildlife-watching participants, such as magazines, membership dues and contributions, land leasing and ownership, and plantings, totaled $142 million—12 percent of all wildlife-watching expenditures. For more details about wildlife-watching expenditures in Michigan, see Table 31.

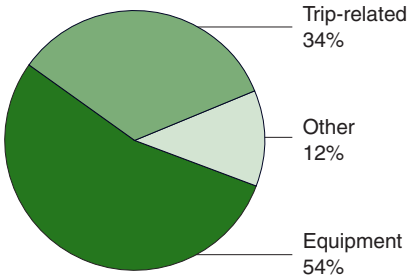
Wildlife-Watching Expenditures in Michigan

(State residents and nonresidents 16 years old and older)

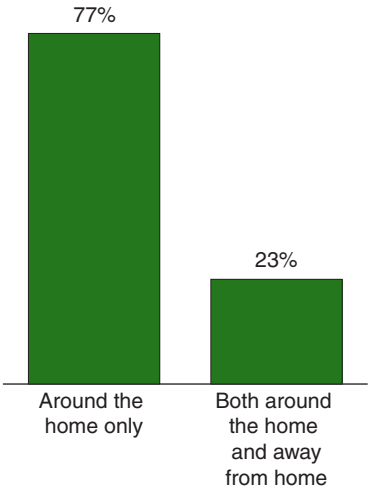
Total	**$1.2 billion**
Trip-related	$417 million
Equipment	$663 million
Wildlife watching	$429 million
Auxiliary and special	$234 million
Other	$142 million

Source: Table 31.

Wildlife-Watching Expenditures in Michigan
(Total: $1.2 billion)



Away-From-Home Activity by Around-The-Home Participants
(Total: 2.9 million participants)



2001–2011 Comparison

Comparing the estimates from the 2001, 2006, and 2011 Surveys gives a perspective on the state of wildlife-related recreation in the early twenty-first century in Michigan. Only the most general recreation comparisons are presented here.

The best way to compare estimates from surveys is not to compare the estimates themselves but to compare the confidence intervals around the estimates. A 90-percent confidence interval around the estimate gives the range of estimates that 90 percent of all possible representative samples would supply. If the 90-percent confidence intervals of the two surveys' estimates overlap, it is not possible to say the two estimates are statistically different.

The state resident estimates cover the participation and expenditure activity of Michigan residents anywhere in the United States. The in-state estimates cover the participation, day, and expenditure activity if U.S. residents in Michigan.

The expenditure estimates were made comparable by adjusting the estimates for inflation—all estimates are in 2011 dollars.

Michigan 2001 and 2011 Comparison
(Numbers in thousands. Expenditures in 2011 dollars)

	2001	2011	Percent change
Fishing			
Anglers in state	1,354	1,744	29
Days in state	19,320	28,177	46
In-state expenditures by U.S. anglers	$1,065,073	$2,427,110	128
State resident anglers	1,039	1,465	41
Total expenditures by state residents	$1,219,915	$2,300,485	[NS]89
Hunting			
Hunters in state	754	529	–30
Days in state	8,994	11,020	[NS]23
In-state expenditures by U.S. hunters	$622,683	$2,338,684	276
State resident hunters	725	507	–30
Total expenditures by state residents	$707,307	$2,514,885	256
Away-From-Home Wildlife Watching			
Participants in state	884	958	[NS]8
Days in state	13,999	10,343	[NS]–26
State resident participants	747	855	[NS]14
Around-The-Home Wildlife Watching			
Total participants	2,361	2,865	21
Observers	1,566	1,693	[NS]8
Feeders	2,078	2,259	[NS]9
Wildlife-Watching Expenditures			
In-state expenditures by U.S. wildlife watchers	$879,887	$1,220,816	[NS]39
Total expenditures by state residents	$917,068	$1,231,400	[NS]34

[NS] Not different from zero at the 10 percent level of significance

Michigan 2006 and 2011 Comparison

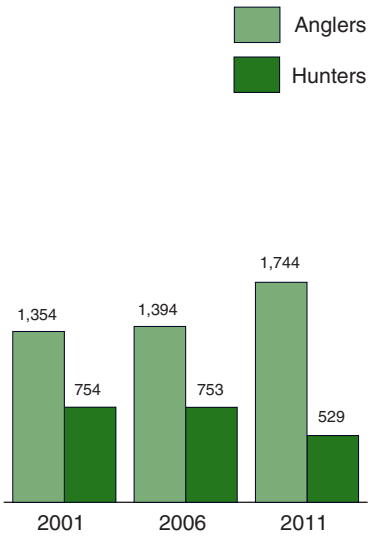
(Numbers in thousands. Expenditures in 2011 dollars)

	2006	2011	Percent change
Fishing			
Anglers in state	1,394	1,744	25
Days in state	24,822	28,177	[NS]14
In-state expenditures by U.S. anglers	$1,864,577	$2,427,110	[NS]30
State resident anglers	1,098	1,465	33
Total expenditures by state residents	$1,855,384	$2,300,485	[NS]24
Hunting			
Hunters in state	753	529	–30
Days in state	11,905	11,020	[NS]–7
In-state expenditures by U.S. hunters	$1,021,915	$2,338,684	129
State resident hunters	721	507	–30
Total expenditures by state residents	$944,448	$2,514,885	166
Away-From-Home Wildlife Watching			
Participants in state	1,034	958	[NS]–7
Days in state	10,043	10,343	[NS]3
State resident participants	827	855	[NS]3
Around-The-Home Wildlife Watching			
Total participants	2,826	2,865	[NS]1
Observers	1,664	1,693	[NS]2
Feeders	2,384	2,259	[NS]–5
Wildlife-Watching Expenditures			
In-state expenditures by U.S. wildlife watchers	$1,810,358	$1,220,816	[NS]–33
Total expenditures by state residents	$1,997,572	$1,231,400	[NS]–38

[NS] Not different from zero at the 10 percent level of significance

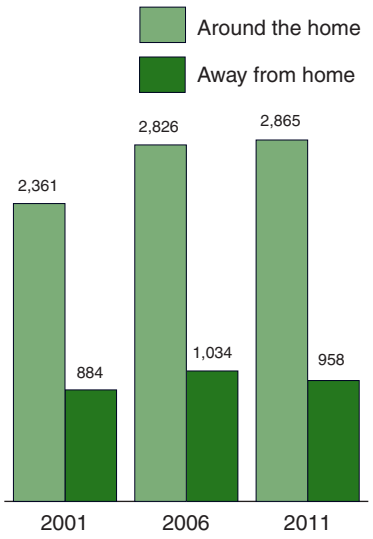
Number of People Who Hunted and Fished in Michigan: 2001–2011

(In thousands)



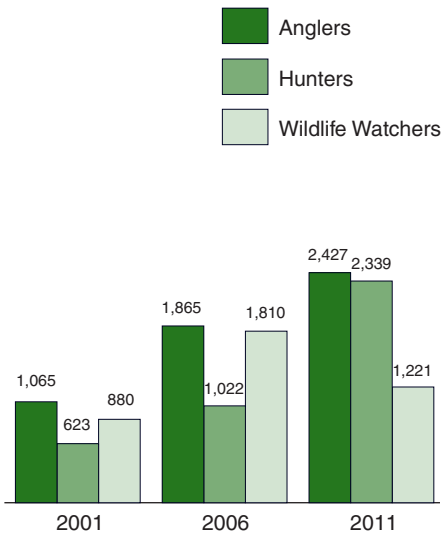
Number of People Who Wildlife Watched in Michigan: 2001–2011

(In thousands)



Total Expenditures by Participants in Michigan

(In millions of 2011 dollars)



Tables

Guide to Statistical Tables

Purpose and Coverage of Tables

The statistical tables of this report were designed to meet a wide range of needs for those interested in wildlife-related recreation. Special terms used in these tables are defined in Appendix A.

The tables are based on responses to the 2011 Survey, which was designed to collect data about participation in wildlife-related recreation. To have taken part in the Survey, a respondent must have been a U.S. resident (a resident of one of the 50 states or the District of Columbia). No one residing outside the United States (including U.S. citizens) was eligible for interviewing. Therefore, reported state and national totals do not include participation by those who were not U.S. residents or who were U.S. citizens residing outside the United States.

Comparability With Previous Surveys

The numbers reported can be compared with those in the 1991, 1996, 2001, and 2006 Survey Reports. The methodology used in 2011 was similar to that used in those Surveys. These results should not be directly compared to results from Surveys earlier than 1991 since there were major changes in methodology. These changes were made to improve accuracy in the information provided.

Coverage of an Individual Table

Since the Survey covers many activities in various places by participants of different ages, all table titles, headnotes, stubs, and footnotes are designed to identify and articulate each item being reported in the table. For example, the title of Table 2 shows that data about anglers and hunters, their days of participation, and their number of trips are reported by type of activity. By contrast, the title of Table 7 indicates that it contains data on freshwater anglers and the days they fished for different species.

Percentages Reported in the Tables

Percentages are reported in the tables for the convenience of the user. When exclusive groups are being reported, the base of a percentage is apparent from its context because the percents add to 100 percent (plus or minus a rounding error). For example, Table 2 reports the number of trips taken by big game hunters, those taken by small game hunters, those taken by migratory bird hunters, and those taken by hunters pursuing other animals. These comprise 100 percent because they are exclusive categories.

Percents should not add to 100 when nonexclusive groups are being reported. Using Table 2 as an example again, note that adding the percentages associated with the total number of big game hunters, total small game hunters, total migratory bird hunters, and total hunters of other animals will not yield total hunters because respondents could hunt for more than one type of game.

When the base of the percentage is not apparent in context, it is identified in a footnote. For example, Table 15 reports two percentages with different bases: one base being the number of total participants at the head of the column and the other base being the total population who are described by the row category. Footnotes are used to clarify the bases of the reported percentages.

Footnotes to the Tables

Footnotes are used to clarify the information or items that are being reported in a table. Symbols in the body of a table indicate important footnotes. The following symbols are used in the tables to refer to the same footnote each time they appear:

* Estimate based on a sample size of 10–29.

... Sample size too small to report data reliably.

Z Less than 0.5 percent.

X Not applicable.

NA Not available.

Estimates based upon fewer than ten responses are regarded as being based on a sample size that is too small for reliable reporting. An estimate based upon at least 10 but fewer than 30 responses is treated as an estimate based on a small sample size. Other footnotes appear, as necessary, to qualify or clarify the estimates reported in the tables. In addition, these two important footnotes appear frequently:

- Detail does not add to total because of multiple responses.
- Detail does not add to total because of multiple responses and nonresponse.

"Multiple responses" is a term used to reflect the fact that individuals or their characteristics fall into more than one category. Using Table 5 as an example, those who fished in saltwater and freshwater appear in both of these totals. Yet each angler is represented only once in the "Total, all fishing" row. Similarly, in Table 12, those who hunt for big game and small game are counted only once as a hunter in the "Total, all hunting" row. Therefore, totals will be smaller than the sum of subcategories when multiple responses exist.

"Nonresponse" exists because the Survey questions were answered voluntarily, and some respondents did not or could not answer all the questions.

Table 1. Fishing and Hunting in Michigan by Resident and Nonresident Sportspersons: 2011

(Population 16 years old and older. Numbers in thousands)

Sportspersons	Total, state residents and nonresidents		State residents		Nonresidents	
	Number	Percent of sportspersons	Number	Percent of resident sportspersons	Number	Percent of nonresident sportspersons
Total sportspersons (fished or hunted)	**1,938**	**100**	**1,568**	**100**	**370**	**100**
Total anglers	**1,744**	**90**	**1,397**	**89**	**347**	**94**
Fished only	1,409	73	1,066	68	343	93
Fished and hunted	335	17	331	21	...	...
Total hunters	**529**	**27**	**501**	**32**	**...**	**...**
Hunted only	*194	*10	*170	*11	...	...
Hunted and fished	335	17	331	21	...	...

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

Note: Detail does not add to total because of multiple responses.

Table 2. Anglers and Hunters, Days of Participation, and Trips in Michigan by Type of Fishing and Hunting: 2011

(Population 16 years old and older. Numbers in thousands)

Type of fishing and hunting	Participants		Days of participation		Trips	
	Number	Percent	Number	Percent	Number	Percent
FISHING						
Total, all fishing	**1,744**	**100**	**28,177**	**100**	**25,100**	**100**
Total, all freshwater	1,721	99	31,948	113	25,100	100
Freshwater, except Great Lakes	1,361	78	20,961	74	15,202	61
Great Lakes	650	37	10,987	39	9,898	39
Saltwater	(X)	(X)	(X)	(X)	(X)	(X)
HUNTING						
Total, all hunting	**529**	**100**	**11,020**	**100**	**8,501**	**100**
Big game	488	92	9,584	87	7,045	83
Small game	*114	*22	*1,208	*11	*641	*8
Migratory birds	...	...	...	...	...	...
Other animals	...	...	...	...	...	...

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably. (X) Not applicable.

Note: Detail does not add to total because of multiple responses.

Table 3. Anglers and Hunters, Trips, and Days of Participation: 2011

(Population 16 years old and older. Numbers in thousands)

Anglers and hunters, trips and days of participation	Activity in Michigan						Activity by Michigan residents in United States					
	Total, state residents and nonresidents		State residents		Nonresidents		Total, in state of residence and in other states		In state of residence		In other states	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
FISHING												
Total anglers	1,744	100	1,397	80	347	20	1,465	100	1,397	95	*200	*14
Total trips	25,100	100	23,370	93	1,730	7	23,975	100	23,370	97	*605	*3
Total days of fishing	28,177	100	26,014	92	2,164	8	26,744	100	26,014	97	*730	*3
Average days of fishing	16	(X)	19	(X)	6	(X)	18	(X)	19	(X)	*4	(X)
HUNTING												
Total hunters	529	100	501	95	...	...	507	100	501	99	...	...
Total trips	8,501	100	8,451	99	...	...	8,971	100	8,451	94	...	...
Total days of hunting	11,020	100	10,840	98	...	...	11,358	100	10,840	95	...	...
Average days of hunting	21	(X)	22	(X)	...	(X)	22	(X)	22	(X)	...	(X)

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably. (X) Not applicable.

Note: Detail does not add to total because of multiple responses.

Table 4. Michigan Resident Anglers and Hunters by Place Fished or Hunted: 2011

(Population 16 years old and older. Numbers in thousands)

Place fished or hunted	Anglers		Hunters	
	Number	Percent	Number	Percent
Total, all places	**1,465**	**100**	**507**	**100**
In-state only	1,265	86	478	94
In-state and other states	*132	*9	...	...
In other states only	...	...	...	...

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

Note: Detail does not add to total because of multiple responses and nonresponse.

Table 5. Michigan Resident Anglers and Hunters, Days of Participation, and Trips in the United States by Type of Fishing and Hunting: 2011

(Population 16 years old and older. Numbers in thousands)

Type of fishing and hunting	Participants		Days of participation		Trips	
	Number	Percent	Number	Percent	Number	Percent
FISHING						
Total, all fishing	**1,465**	**100**	**26,744**	**100**	**23,975**	**100**
Total, all freshwater	1,404	96	26,344	99	23,614	98
Freshwater, except Great Lakes	1,100	75	19,355	72	14,179	59
Great Lakes	566	39	10,438	39	9,435	39
Saltwater	*144	*10	*381	*1	*361	*2
HUNTING						
Total, all hunting	**507**	**100**	**11,358**	**100**	**8,971**	**100**
Big game	485	96	9,823	86	7,557	84
Small game	*96	*19	*1,166	*10	*600	*7
Migratory birds	...	...	...	...	...	...
Other animals	...	...	...	...	...	...

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

Note: Detail does not add to total because of multiple responses.

Table 6. Freshwater Anglers, Trips, Days of Fishing, and Type of Water Fished: 2011

(Population 16 years old and older. Numbers in thousands)

Anglers, trips, and days of fishing	Activity in Michigan					
	Total, state residents and nonresidents		State residents		Nonresidents	
	Number	Percent	Number	Percent	Number	Percent
Total anglers	**1,361**	**100**	**1,054**	**77**	**307**	**23**
Total trips	**15,202**	**100**	**13,966**	**92**	**1,236**	**8**
Total days of fishing	**20,961**	**100**	**19,006**	**91**	**1,955**	**9**
Average days of fishing	15	(X)	18	(X)	6	(X)
ANGLERS						
Total, all types of water	**1,361**	**100**	**1,054**	**77**	**307**	**23**
Ponds, lakes, or reservoirs	1,215	100	951	78	*263	*22
Rivers or streams	586	100	*501	*85	*85	*15
DAYS						
Total, all types of water	**20,961**	**100**	**19,006**	**91**	**1,955**	**9**
Ponds, lakes, or reservoirs	16,926	100	15,461	91	*1,465	*9
Rivers or streams	8,159	100	*7,636	*94	*523	*6

* Estimate based on a sample size of 10–29. (X) Not applicable.

Note: Detail does not add to total because of multiple responses.

Table 7. Freshwater Anglers and Days of Fishing in Michigan by Type of Fish: 2011

(Population 16 years old and older. Numbers in thousands)

Anglers and days of fishing	Activity in Michigan						
	Total, state residents and nonresidents			State residents		Nonresidents	
	Number	Percent of total types	Percent of anglers/days	Number	Percent of anglers/days	Number	Percent of anglers/days
ANGLERS							
Total, all types of fish	**1,361**	**100**	**100**	**1,054**	**77**	**307**	**23**
Crappie	*268	*20	*100	*227	*85	...	...
Panfish	811	60	100	643	79	*168	*21
White bass, striped bass, striped bass hybrids	*266	*20	*100	*264	*99	...	...
Black bass	589	43	100	487	83	*102	*17
Catfish, bullheads	...	...	...	...	...	...	...
Walleye, sauger	*287	*21	*100	*268	*93	...	...
Northern pike, pickerel, muskie, muskie hybrids	*384	*28	*100	*330	*86	...	...
Steelhead	...	...	...	...	...	...	...
Trout	*132	*10	*100	*100	*76	...	...
Salmon	...	...	...	...	...	...	...
Anything[1]	...	...	...	...	...	...	...
Other freshwater fish	...	...	...	...	...	...	...
DAYS							
Total, all types of fish	**20,961**	**100**	**100**	**19,006**	**91**	**1,955**	**9**
Crappie	*3,841	*18	*100	*3,713	*97	...	...
Panfish	8,469	40	100	7,320	86	*1,149	*14
White bass, striped bass, striped bass hybrids	*4,188	*20	*100	*4,178	*100	...	...
Black bass	8,739	42	100	8,062	92	*677	*8
Catfish, bullheads	...	...	...	...	...	...	...
Walleye, sauger	*5,116	*24	*100	*4,988	*98	...	...
Northern pike, pickerel, muskie, muskie hybrids	*4,387	*21	*100	*3,595	*82	...	...
Steelhead	...	...	...	...	...	...	...
Trout	*1,075	*5	*100	*1,002	*93	...	...
Salmon	...	...	...	...	...	...	...
Anything[1]	...	...	...	...	...	...	...
Other freshwater fish	...	...	...	...	...	...	...

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

[1] Respondent fished for no specific species and identified "Anything" from a list of categories of fish.

Note: Detail does not add to total because of multiple responses.

Table 8. Great Lakes Anglers, Trips, and Days of Fishing in Michigan: 2011

(Population 16 years old and older. Numbers in thousands)

Anglers, trips, and days of fishing	Activity in Michigan					
	Total, state residents and nonresidents		State residents		Nonresidents	
	Number	Percent	Number	Percent	Number	Percent
Total anglers	**650**	**100**	**558**	**86**	***92**	***14**
Total trips	**9,898**	**100**	**9,404**	**95**	***494**	***5**
Total days	**10,987**	**100**	**10,373**	**94**	***614**	***6**
Average days of fishing	17	(X)	19	(X)	*7	(X)

* Estimate based on a sample size of 10–29. (X) Not applicable.

Table 9. Great Lakes Anglers and Days of Fishing in Michigan by Type of Fish: 2011

(Population 16 years old and older. Numbers in thousands)

Anglers and days of fishing	Activity in Michigan						
	Total, state residents and nonresidents			State residents		Nonresidents	
	Number	Percent of total types	Percent of anglers/days	Number	Percent of anglers/days	Number	Percent of anglers/days
ANGLERS							
Total, all types of fish	**650**	**100**	**100**	**558**	**86**	***92**	***14**
Perch	*224	*34	*100	*203	*91	...	...
Black bass	...	...	...	...	...	...	...
Walleye, sauger	*251	*39	*100	*220	*88	...	...
Northern pike, pickerel, muskie, muskie hybrids	...	...	...	...	...	...	...
Salmon	*172	*26	*100	*135	*78	...	...
Steelhead	*116	*18	*100	...	...	...	...
Lake trout	*89	*14	*100	...	...	...	...
Other trout	...	...	...	...	...	...	...
Anything[1]	...	...	...	...	...	...	...
Other Great Lakes fish	...	...	...	...	...	...	...
DAYS							
Total, all types of fish	**10,987**	**100**	**100**	**10,373**	**94**	***614**	***6**
Perch	***3,607**	***33**	***100**	***3,569**	***99**	**...**	**...**
Black bass	...	...	...	...	...	...	...
Walleye, sauger	*3,192	*29	*100	*3,117	*98	...	...
Northern pike, pickerel, muskie, muskie hybrids	...	...	...	...	...	...	...
Salmon	*2,531	*23	*100	*2,161	*85	...	...
Steelhead	*2,624	*24	*100	...	...	...	...
Lake trout	*1,271	*12	*100	...	...	...	...
Other trout	...	...	...	...	...	...	...
Anything[1]	...	...	...	...	...	...	...
Other Great Lakes fish	...	...	...	...	...	...	...

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

[1] Respondent fished for no specific species and identified "Anything" from a list of categories of fish.

Table 10. Saltwater Anglers, Trips, and Days of Fishing in Michigan: 2011

This table does not apply to this state.

Table 11. Saltwater Anglers and Days of Fishing in Michigan by Type of Fish: 2011

This table does not apply to this state.

Table 12. Hunters, Trips, and Days of Hunting in Michigan by Type of Hunting: 2011

(Population 16 years old and older. Numbers in thousands)

Hunters, trips, and days of hunting	Activity in Michigan					
	Total, state residents and nonresidents		State residents		Nonresidents	
	Number	Percent	Number	Percent	Number	Percent
HUNTERS						
Total, all hunting	**529**	**100**	**501**	**95**	**...**	**...**
Big game	488	100	479	98	...	...
Small game	*114	*100	*96	*84	...	...
Migratory birds	...	...	...	...	...	...
Other animals	...	...	...	...	...	...
TRIPS						
Total, all hunting	**8,501**	**100**	**8,451**	**99**	**...**	**...**
Big game	7,045	100	7,036	100	...	...
Small game	*641	*100	*600	*94	...	...
Migratory birds	...	...	...	...	...	...
Other animals	...	...	...	...	...	...
DAYS						
Total, all hunting	**11,020**	**100**	**10,840**	**98**	**...**	**...**
Big game	9,584	100	9,445	99	...	...
Small game	*1,208	*100	*1,166	*97	...	...
Migratory birds	...	...	...	...	...	...
Other animals	...	...	...	...	...	...

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

Note: Detail does not add to total because of multiple responses.

Table 13. Hunters and Days of Hunting in Michigan by Type of Game: 2011

(Population 16 years old and older. Numbers in thousands)

Type of game	Hunters, state residents and nonresidents		Days of hunting	
	Number	Percent	Number	Percent
Total, all types of game	**529**	**100**	**11,020**	**100**
Big game, total	**488**	**92**	**9,584**	**87**
Deer	488	92	9,259	84
Elk	...	...	...	...
Bear	...	...	...	...
Wild turkey	...	...	...	...
Other big game	...	...	...	...
Small game, total	***114**	***22**	***1,208**	***11**
Rabbit, hare	...	...	...	...
Quail	...	...	...	...
Grouse/prairie chicken	...	...	...	...
Squirrel	...	...	...	...
Pheasant	...	...	...	...
Other small game	...	...	...	...
Migratory birds, total	**...**	**...**	**...**	**...**
Waterfowl	...	...	...	...
Geese	...	...	...	...
Ducks	...	...	...	...
Doves	...	...	...	...
Other migratory birds	...	...	...	...
Other animals, total[1]	**...**	**...**	**...**	**...**

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

[1] Includes groundhog, raccoon, fox, coyote, crow, prairie dog, etc.

Note: Detail does not add to total because of multiple responses.

Table 14. Hunters and Days of Hunting in Michigan by Type of Land: 2011

(Population 16 years old and older. Numbers in thousands)

Hunters and days of hunting	Total, state residents and nonresidents		State residents		Nonresidents	
	Number	Percent	Number	Percent	Number	Percent
HUNTERS						
Total, all types of land	**529**	**100**	**501**	**100**	**...**	**...**
Public land, total	***267**	***51**	***261**	***52**	**...**	**...**
Public land only	*121	*23	...	...	...	...
Public and private land	*146	*28	*146	*29	...	...
Private land, total	**408**	**77**	**387**	**77**	**...**	**...**
Private land only	262	49	241	48	...	...
Private and public land	*146	*28	*146	*29	...	...
DAYS						
Total, all types of land	**11,020**	**100**	**10,840**	**100**	**...**	**...**
Public land[1]	*3,035	*28	*2,902	*27	...	...
Private land[2]	8,564	78	8,518	79	...	...

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

[1] Days of hunting on public land includes both days spent solely on public land and those spent on public and private land.

[2] Days of hunting on private land includes both days spent solely on private land and those spent on private and public land.

Note: Detail does not add to total because of multiple responses and nonresponse.

Table 15. Selected Characteristics of Michigan Resident Anglers and Hunters: 2011

(Population 16 years old and older. Numbers in thousands)

Characteristic	Population		Sportspersons (fished or hunted)			Anglers			Hunters		
	Number	Percent	Number	Percent who participated	Percent of sportspersons	Number	Percent who participated	Percent of anglers	Number	Percent who participated	Percent of hunters
Total persons	**7,787**	**100**	**1,636**	**21**	**100**	**1,465**	**19**	**100**	**507**	**7**	**100**
Population Density of Residence											
Urban	5,647	73	804	14	49	706	13	48	*223	*4	*44
Rural	2,140	27	831	39	51	759	35	52	284	13	56
Population Size of Residence											
Metropolitan Statistical Area (MSA)	7,237	93	1,378	19	84	1,254	17	86	338	5	67
1,000,000 or more	2,897	37	*415	*14	*25	*352	*12	*24	...	...	...
250,000 to 999,999	2,310	30	432	19	26	*393	*17	*27	*101	*4	*20
50,000 to 249,999	2,030	26	531	26	32	509	25	35	*122	*6	*24
Outside MSA	551	7	*258	*47	*16	*211	*38	*14	*169	*31	*33
Sex											
Male	3,427	44	1,181	34	72	1,025	30	70	419	12	83
Female	4,361	56	455	10	28	440	10	30	...	...	...
Age											
16 to 17 years	*261	*3	...	...	...	...	...	...	...	...	...
18 to 24 years	884	11	...	...	...	...	...	...	...	...	...
25 to 34 years	1,119	14	*313	*28	*19	*283	*25	*19	...	...	...
35 to 44 years	1,214	16	*221	*18	*14	*198	*16	*13	...	...	...
45 to 54 years	1,568	20	550	35	34	515	33	35	*197	*13	*39
55 to 64 years	1,539	20	*414	*27	*25	*353	*23	*24	*131	*9	*26
65 years and older	1,203	15	...	...	...	...	...	...	...	...	...
65 to 74 years	647	8	...	...	...	...	...	...	...	...	...
75 and older	556	7	...	...	...	...	...	...	...	...	...
Ethnicity											
Hispanic	*435	*6	...	...	...	...	...	...	...	...	...
Non-Hispanic	7,352	94	1,583	22	97	1,412	19	96	501	7	99
Race											
White	6,640	85	1,538	23	94	1,368	21	93	507	8	100
African American	759	10	...	...	...	...	...	...	...	...	...
All others	389	5	...	...	...	...	...	...	...	...	...
Annual Household Income											
Less than $20,000	541	7	...	...	...	...	...	...	...	...	...
$20,000 to $29,999	1,083	14	*118	*11	*7	...	...	...	...	...	...
$30,000 to $39,999	604	8	*191	*32	*12	*175	*29	*12	...	...	...
$40,000 to $49,999	615	8	*298	*48	*18	...	...	...	...	...	...
$50,000 to $74,999	880	11	*265	*30	*16	*236	*27	*16	...	...	...
$75,000 to $99,999	1,308	17	*237	*18	*14	*230	*18	*16	...	...	...
$100,000 to $149,999	640	8	*220	*34	*13	*197	*31	*13	*68	*11	*13
$150,000 or more	501	6	*100	*20	*6	...	...	...	...	...	...
Not reported	1,615	21	*113	*7	*7	...	...	...	...	...	...
Education											
11 years or less	588	8	*110	*19	*7	...	...	...	...	...	...
12 years	2,978	38	569	19	35	471	16	32	*185	*6	*36
1 to 3 years of college	2,289	29	480	21	29	459	20	31	*130	*6	*26
4 years or more of college	1,933	25	476	25	29	*457	*24	*31	*128	*7	*25

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

Note: Detail does not add to total because of multiple responses. Percent who participated columns show the percent of each row's population who participated in the activity named by the column (the percent of those living in urban areas who fished, etc.). Remaining percent columns show the percent of each column's participants who are described by the row heading (the percent of anglers who lived in urban areas, etc.).

Table 16. Summary of Expenditures in Michigan by State Residents and Nonresidents Combined for Fishing and Hunting: 2011

(Population 16 years old and older)

Expenditure item	Amount (thousands of dollars)	Spenders (thousands)	Average per spender (dollars)[1]	Average per sportsperson (dollars)[1]
FISHING AND HUNTING				
Total	**4,869,636**	**2,014**	**2,418**	**2,498**
Food and lodging	479,384	1,563	307	247
Transportation	488,271	1,688	289	249
Other trip costs[2]	396,422	1,498	265	205
Equipment (fishing, hunting)	690,173	1,117	618	354
Auxiliary equipment[3]	199,719	598	334	94
Special equipment[4]	*1,641,297	*171	*9,572	*847
Magazines, books, and DVDs	*14,681	*255	*58	*8
Membership dues and contributions	*75,610	*183	*414	*39
Other[5]	884,078	1,523	581	455
FISHING				
Total	**2,427,110**	**1,799**	**1,349**	**1,375**
Food and lodging	373,964	1,407	266	214
Transportation	344,495	1,496	230	195
Other trip costs[2]	374,276	1,464	256	215
Fishing equipment	259,043	865	299	145
Auxiliary equipment[3]	*84,705	*226	*375	*39
Special equipment[4]	*774,162	*84	*9,168	*444
Magazines, books, and DVDs	...	...	...	...
Membership dues and contributions	...	...	...	...
Other[5]	185,651	1,261	147	105
HUNTING				
Total	**2,338,684**	**539**	**4,337**	**4,409**
Food and lodging	105,419	413	256	199
Transportation	143,776	436	330	272
Other trip costs[2]	*22,146	*236	*94	*42
Hunting equipment	407,636	421	968	768
Auxiliary equipment[3]	*76,709	*277	*277	*143
Special equipment[4]	...	...	...	...
Magazines, books, and DVDs	...	...	...	...
Membership dues and contributions	...	...	...	...
Other[5]	698,427	501	1,394	1,313
UNSPECIFIED[6]				
Total	***78,359**	***314**	***250**	***40**

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

[1] Average expenditures are annual estimates.

[2] Includes boating costs, equipment rental, guide fees, access fees, heating and cooking fuel, and ice and bait (for fishing only).

[3] Includes sleeping bags, packs, duffel bags, tents, binoculars and field glasses, special fishing and hunting clothing, foul weather gear, boots and waders, maintenance and repair of equipment, processing and taxidermy costs, and electronic equipment such as a GPS device.

[4] Includes big-ticket items bought primarily for hunting and fishing including boats, campers, cabins, trail bikes, dune buggies, 4 x 4 vehicles, ATVs, 4-wheelers, snowmobiles, pickups, vans, travel and tent trailers, motor homes, house trailers, recreational vehicles (RVs) and other special equipment.

[5] Includes land leasing and ownership, licenses, stamps, tags, permits, and plantings (for hunting only).

[6] Respondent could not specify whether expenditure was primarily for either fishing or hunting.

Note: Detail does not add to total because of multiple responses and nonresponse.

Table 17. Summary of Fishing Trip and Equipment Expenditures in Michigan by State Residents and Nonresidents Combined by Type of Fishing: 2011

(Population 16 years old and older)

Expenditure item	Amount (thousands of dollars)	Spenders (thousands)	Average per spender (dollars)[1]	Average per angler (dollars)[1]
ALL FISHING				
Total	**2,210,646**	**1,717**	**1,288**	**1,252**
Food and lodging	373,964	1,407	266	214
Transportation	344,495	1,496	230	195
Other trip costs	374,276	1,464	256	215
Equipment	1,117,911	923	1,212	628
ALL FRESHWATER				
Total	**1,896,784**	**1,650**	**1,149**	**1,081**
Food and lodging	373,964	1,407	266	214
Transportation	333,616	1,444	231	191
Other trip costs	374,276	1,464	256	215
Equipment	814,928	868	939	461
FRESHWATER, EXCEPT GREAT LAKES				
Total	**801,290**	**1,309**	**612**	**453**
Food and lodging	208,136	1,052	198	119
Transportation	211,949	1,143	185	122
Other trip costs	189,161	1,095	173	108
Equipment	192,044	669	287	104
GREAT LAKES				
Total	**1,095,493**	**625**	**1,752**	**628**
Food and lodging	165,828	599	277	95
Transportation	121,667	562	216	70
Other trip costs	185,114	583	318	106
Equipment	*622,884	*332	*1,877	*357
SALTWATER				
Total	**...**	**...**	**...**	**...**
Food and lodging	...	...	...	...
Transportation	...	...	...	...
Other trip costs	...	...	...	...
Equipment	...	...	...	...

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

[1] Average expenditures are annual estimates.

Note: Detail does not add to total because of multiple responses and nonresponse. See Table 19 for detailed listing of expenditure items.

Table 18. Summary of Hunting Trip and Equipment Expenditures in Michigan by State Residents and Nonresidents Combined by Type of Hunting: 2011

(Population 16 years old and older)

Expenditure item	Amount (thousands of dollars)	Spenders (thousands)	Average per spender (dollars)[1]	Average per type of hunter (dollars)[1]
ALL HUNTING				
Total	**1,588,345**	**522**	**3,042**	**2,998**
Food and lodging	105,419	413	256	199
Transportation	143,776	436	330	272
Other trip costs	*22,146	*236	*94	*42
Equipment	1,317,004	450	2,927	2,485
BIG GAME				
Total	**1,394,830**	**468**	**2,981**	**2,635**
Food and lodging	93,490	378	247	177
Transportation	122,699	350	351	232
Other trip costs	*13,831	*201	*69	*26
Equipment	1,164,810	383	3,043	2,200
SMALL GAME				
Total	***27,609**	***106**	***262**	***119**
Food and lodging	*6,141	*71	*86	*28
Transportation	*9,256	*83	*112	*42
Other trip costs	...	...	...	...
Equipment	...	...	...	...
MIGRATORY BIRDS				
Total	**...**	**...**	**...**	**...**
Food and lodging	...	...	...	...
Transportation	...	...	...	...
Other trip costs	...	...	...	...
Equipment	...	...	...	...
OTHER ANIMALS				
Total	**...**	**...**	**...**	**...**
Food and lodging	...	...	...	...
Transportation	...	...	...	...
Other trip costs	...	...	...	...
Equipment	...	...	...	...

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

[1] Average expenditures are annual estimates.

Note: Detail does not add to total because of multiple responses and nonresponse. See Table 20 for detailed listing of expenditure items.

Table 19. Expenditures in Michigan by State Residents and Nonresidents Combined for Fishing: 2011

(Population 16 years old and older)

Expenditure item	Expenditures		Spenders		
	Amount (thousands of dollars)	Average per angler (dollars)[1]	Number (thousands)	Percent of anglers	Average per spender (dollars)[1]
Total, all items	**2,427,110**	**1,375**	**1,799**	**103**	**1,349**
TRIP-RELATED EXPENDITURES					
Total trip-related	**1,092,735**	**624**	**1,655**	**95**	**660**
Food and lodging, total	**373,964**	**214**	**1,407**	**81**	**266**
Food	228,408	131	1,385	79	165
Lodging	*145,556	*83	*350	*20	*416
Transportation	344,495	195	1,496	86	230
Other trip costs, total	**374,276**	**215**	**1,464**	**84**	**256**
Privilege and other fees[2]	*47,349	*27	*357	*20	*133
Boating costs[3]	253,167	145	725	42	349
Bait	50,438	29	998	57	51
Ice	12,711	7	619	35	21
Heating and cooking fuel	*10,610	*6	*236	*14	*45
EQUIPMENT AND OTHER EXPENDITURES PRIMARILY FOR FISHING					
Fishing equipment, total	**259,043**	**145**	**865**	**50**	**299**
Reels, rods, and rod-making components	*44,548	*23	*306	*18	*146
Lines, hooks, sinkers, etc.	46,511	27	686	39	68
Artificial lures and flies	87,072	50	641	37	136
Creels, stringers, fish bags, landing nets, and gaff hooks	*2,559	*1	*85	*5	*30
Minnow seines, traps, and bait containers	...	...	...	...	...
Other fishing equipment[4]	*76,803	*43	*341	*20	*225
Auxiliary equipment[5]	*84,705	*39	*226	*13	*375
Special equipment[6]	*774,162	*444	*84	*5	*9,168
Other fishing costs[7]	216,464	123	1,294	74	167

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

[1] Average expenditures are annual estimates.

[2] Includes boat or equipment rental and fees for guides, pack trip (party and charter boats, etc.), public land use, and private land use.

[3] Includes boat launching, mooring, storage, maintenance, insurance, pumpout fees, and fuel.

[4] Includes electronic fishing devices (depth finders, fish finders, etc.), tackle boxes, ice fishing equipment, and other fishing equipment.

[5] Includes sleeping bags, packs, duffel bags, tents, binoculars and field glasses, special fishing clothing, foul weather gear, boots and waders, maintenance and repair of equipment, processing and taxidermy costs, and electronic equipment such as a GPS device.

[6] Includes big-ticket items bought primarily for fishing including boats, campers, cabins, trail bikes, dune buggies, 4 x 4 vehicles, ATVs, 4-wheelers, snowmobiles, pickups, vans, travel and tent trailers, motor homes, house trailers, recreational vehicles (RVs) and other special equipment.

[7] Includes magazines, books, and DVDs, membership dues and contributions, land leasing and ownership, and licenses, stamps, tags, and permits.

Note: Detail does not add to total because of multiple responses and nonresponse. Percent of anglers may be greater than 100 because spenders who did not fish in this state are included.

Table 20. Expenditures in Michigan by State Residents and Nonresidents Combined for Hunting: 2011

(Population 16 years old and older)

Expenditure item	Expenditures		Spenders		
	Amount (thousands of dollars)	Average per hunter (dollars)[1]	Number (thousands)	Percent of hunters	Average per spender (dollars)[1]
Total, all items	**2,338,684**	**4,409**	**539**	**102**	**4,337**
TRIP-RELATED EXPENDITURES					
Total trip-related	**271,341**	**513**	**466**	**88**	**583**
Food and lodging, total	**105,419**	**199**	**413**	**78**	**256**
Food	101,587	192	413	78	246
Lodging	...	...	...	...	...
Transportation	143,776	272	436	82	330
Other trip costs, total	***22,146**	***42**	***236**	***45**	***94**
Privilege and other fees[2]	...	...	...	...	...
Boating costs[3]	...	...	...	...	...
Heating and cooking fuel	*10,578	*20	*201	*38	*53
EQUIPMENT AND OTHER EXPENDITURES PRIMARILY FOR HUNTING					
Hunting equipment, total	**407,636**	**768**	**421**	**80**	**968**
Firearms	*142,925	*268	*194	*37	*735
Ammunition	77,458	146	343	65	226
Other hunting equipment[4]	187,253	354	356	67	526
Auxiliary equipment[5]	*76,709	*143	*277	*52	*277
Special equipment[6]	...	...	...	...	...
Other hunting costs[7]	750,339	1,411	509	96	1,474

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

[1] Average expenditures are annual estimates.

[2] Includes guide fees, pack trip and package fees, public and private land use access fees, and rental of equipment such as boats and hunting or camping equipment.

[3] Boating costs include launching, mooring, storage, maintenance, insurance, pumpout fees, and fuel.

[4] Includes telescopic sights, decoys and game calls, handloading equipment and components, hunting dogs and associated costs, hunting knives, bows, arrows, archery equipment, and other hunting equipment.

[5] Includes sleeping bags, packs, duffel bags, tents, binoculars and field glasses, special hunting clothing, foul weather gear, boots and waders, maintenance and repair of equipment, processing and taxidermy costs, and electronic equipment such as a GPS device.

[6] Includes big-ticket items bought primarily for hunting including boats, campers, cabins, trail bikes, dune buggies, 4 x 4 vehicles, ATVs, 4-wheelers, snowmobiles, pickups, vans, travel and tent trailers, motor homes, house trailers, recreational vehicles (RVs) and other special equipment.

[7] Includes magazines, books, and DVDs, membership dues and contributions, land leasing and ownership, and licenses, stamps, tags, and permits.

Note: Detail does not add to total because of multiple responses and nonresponse. Percent of hunters may be greater than 100 because spenders who did not hunt in this state are included.

Table 21. Trip and Equipment Expenditures in Michigan for Fishing and Hunting by Michigan Residents and Nonresidents: 2011

(Population 16 years old and older)

Expenditure item	Amount (thousands of dollars)	Spenders (thousands)	Average per spender (dollars)[1]	Average per sportsperson (dollars)[1]
STATE RESIDENTS AND NONRESIDENTS				
Trip and equipment expenditures for fishing and hunting, total	**3,895,266**	**1,929**	**2,019**	**7,364**
Trip and equipment expenditures for fishing, total	**2,212,635**	**1,724**	**1,284**	**1,252**
Food and lodging	373,964	1,407	266	214
Transportation	344,495	1,496	230	195
Boating costs[2]	253,167	725	349	145
Other trip costs[3]	121,109	1,318	92	69
Equipment	1,119,899	929	1,205	628
Trip and equipment expenditures for hunting, total	**1,611,839**	**626**	**2,575**	**2,998**
Food and lodging	105,419	413	256	199
Transportation	143,776	436	330	272
Boating costs[2]	...	...	...	...
Other trip costs[3]	*19,187	*229	*84	*36
Equipment	1,340,498	554	2,421	2,485
Unspecified equipment[4]	***70,792**	***234**	***303**	***134**
STATE RESIDENTS				
Trip and equipment expenditures for fishing and hunting, total	**3,525,639**	**1,503**	**2,346**	**7,031**
Trip and equipment expenditures for fishing, total	**1,896,051**	**1,326**	**1,430**	**1,347**
Food and lodging	228,625	1,153	198	164
Transportation	258,606	1,173	220	181
Boating costs[2]	234,969	622	378	168
Other trip costs[3]	94,223	1,019	93	67
Equipment	1,079,628	758	1,425	766
Trip and equipment expenditures for hunting, total	**1,559,665**	**589**	**2,646**	**3,064**
Food and lodging	93,116	393	237	186
Transportation	141,905	420	338	283
Boating costs[2]	...	...	...	...
Other trip costs[3]	*16,420	*213	*77	*33
Equipment	1,305,266	521	2,503	2,556
Unspecified equipment[4]	***69,923**	***223**	***313**	***139**
NONRESIDENTS				
Trip and equipment expenditures for fishing and hunting, total	**369,627**	**426**	**867**	**13,434**
Trip and equipment expenditures for fishing, total	**316,584**	**398**	**796**	**870**
Food and lodging	145,339	254	572	419
Transportation	85,889	323	266	247
Boating costs[2]	*18,198	*103	*176	*52
Other trip costs[3]	26,886	299	90	77
Equipment	*40,271	*172	*235	*74
Trip and equipment expenditures for hunting, total	***52,174**	***37**	***1,428**	**...**
Food and lodging	...	...	...	...
Transportation	...	...	...	...
Boating costs[2]	...	...	...	...
Other trip costs[3]	...	...	...	...
Equipment	...	...	...	...
Unspecified equipment[4]	**...**	**...**	**...**	**...**

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

[1] Average expenditures are annual estimates.

[2] Includes boat launching, mooring, storage, maintenance, insurance, pumpout fees, and fuel.

[3] Includes equipment rental, guide and access fees, ice and bait for fishing, and heating and cooking oil.

[4] Respondent could not specify whether item was for hunting or fishing.

Note: Detail does not add to total because of multiple responses and nonresponse.

Table 22. Summary of Michigan Residents' Fishing and Hunting Expenditures Both Inside and Outside Michigan: 2011

(Population 16 years old and older)

Expenditure item	Amount (thousands of dollars)	Spenders (thousands)	Average per spender (dollars)[1]	Average per sportsperson (dollars)[1]
FISHING AND HUNTING				
Total	**4,919,017**	**1,572**	**3,130**	**3,007**
Food and lodging	403,476	1,346	300	247
Transportation	516,645	1,350	383	316
Other trip costs[2]	431,097	1,192	362	264
Equipment (fishing, hunting)	727,944	1,004	725	445
Auxiliary equipment[3]	205,253	604	340	125
Special equipment[4]	*1,645,024	*190	*8,671	*1,006
Magazines, books, and DVDs	*14,631	*243	*60	*9
Membership dues and contributions	*81,406	*238	*342	*50
Other[5]	893,540	1,312	681	546
FISHING				
Total	**2,300,485**	**1,385**	**1,660**	**1,570**
Food and lodging	263,396	1,207	218	180
Transportation	294,594	1,173	251	201
Other trip costs[2]	346,690	1,181	294	237
Fishing equipment	322,074	770	418	220
Auxiliary equipment[3]	*85,822	*233	*369	*59
Special equipment[4]	*777,890	*103	*7,576	*531
Magazines, books, and DVDs	...	...	...	...
Membership dues and contributions	...	...	...	...
Other[5]	179,325	1,070	168	122
HUNTING				
Total	**2,514,885**	**507**	**4,958**	**4,958**
Food and lodging	140,081	413	339	276
Transportation	222,051	426	522	438
Other trip costs[2]	*84,407	*227	*372	*166
Hunting equipment	382,376	409	936	754
Auxiliary equipment[3]	*81,320	*286	*285	*160
Special equipment[4]	...	...	...	...
Magazines, books, and DVDs	...	...	...	...
Membership dues and contributions	*54,097	*110	*490	*107
Other[5]	714,215	493	1,447	1,408
UNSPECIFIED[6]				
Total	***78,165**	***311**	***251**	***48**

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

[1] Average expenditures are annual estimates.

[2] Includes boating costs, equipment rental, guide fees, access fees, heating and cooking fuel, and ice and bait (for fishing only).

[3] Includes sleeping bags, packs, duffel bags, tents, binoculars and field glasses, special fishing and hunting clothing, foul weather gear, boots and waders, maintenance and repair of equipment, processing and taxidermy costs, and electronic equipment such as a GPS device.

[4] Includes big-ticket items bought primarily for hunting and fishing including boats, campers, cabins, trail bikes, dune buggies, 4 x 4 vehicles, ATVs, 4-wheelers, snowmobiles, pickups, vans, travel and tent trailers, motor homes, house trailers, recreational vehicles (RVs) and other special equipment.

[5] Includes land leasing and ownership, licenses, stamps, tags, and permits, and plantings (for hunting only).

[6] Respondent could not specify whether expenditure was primarily for fishing or hunting.

Note: Detail does not add to total because of multiple responses and nonresponse. See Tables 19–20 for a detailed listing of expenditure items.

Table 23. In-State and Out-of-State Expenditures by Michigan Residents for Fishing and Hunting: 2011

(State population 16 years old and older)

Expenditure item	Amount (thousands of dollars)	Spenders (thousands)	Average per spender (dollars)[1]	Average per sportsperson (dollars)[1]
IN MICHIGAN				
Expenditures for fishing and hunting, total	**4,484,176**	**1,572**	**2,853**	**2,314**
Trip-related expenditures	1,070,822	1,473	727	553
Equipment (fishing and hunting)	641,535	968	662	331
Auxiliary equipment[2]	173,726	514	338	90
Special equipment[3]	*1,639,556	*162	*10,098	*846
Other[4]	958,537	1,331	720	495
Expenditures for fishing, total	**2,100,782**	**1,385**	**1,516**	**1,204**
Trip-related expenditures	816,423	1,319	619	468
Fishing equipment	242,697	735	330	139
Auxiliary equipment[2]	*62,521	*161	*388	*36
Special equipment[3]	...	...	...	...
Other[4]	206,720	1,074	193	119
Expenditures for hunting, total	**2,280,422**	**501**	**4,548**	**4,311**
Trip-related expenditures	254,399	438	581	481
Hunting equipment	375,343	394	953	710
Auxiliary equipment[2]	*73,771	*268	*276	*139
Special equipment[3]	...	...	...	...
Other[4]	744,251	501	1,484	1,407
Unspecified expenditures for fishing and hunting, total[5]	***77,489**	***304**	***255**	***40**
OUT OF STATE				
Expenditures for fishing and hunting, total	***434,841**	***1,222**	***356**	***224**
Trip-related expenditures	*280,396	*176	*1,592	*145
Equipment (fishing and hunting)	...	...	...	...
Auxiliary equipment[2]	...	...	...	...
Special equipment[3]	...	...	...	...
Other[4]	*31,041	*482	*64	*16
Expenditures for fishing, total	***199,702**	***887**	***225**	***114**
Trip-related expenditures	*88,257	*166	*531	*51
Fishing equipment	...	...	...	...
Auxiliary equipment[2]	...	...	...	...
Special equipment[3]	...	...	...	...
Other[4]	...	...	...	...
Expenditures for hunting, total	***235,139**	***435**	***541**	***445**
Trip-related expenditures	...	...	...	...
Hunting equipment	...	...	...	...
Auxiliary equipment[2]	...	...	...	...
Special equipment[3]	...	...	...	...
Other[4]	...	...	...	...
Unspecified expenditures for fishing and hunting, total[5]	**...**	**...**	**...**	**...**

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

[1] Average expenditures are annual estimates.

[2] Auxiliary equipment includes sleeping bags, packs, duffel bags, tents, binoculars and field glasses, special fishing and hunting clothing, foul weather gear, boots and waders, maintenance and repair of equipment, processing and taxidermy costs, and electronic equipment such as a GPS device.

[3] Special equipment includes boats, campers, cabins, trail bikes, dune buggies, 4 x 4 vehicles, ATVs, 4-wheelers, snowmobiles, pickups, vans, travel and tent trailers, motor homes, house trailers, recreational vehicles (RVs) and other special equipment.

[4] Other equipment includes expenditures for magazines, books, DVDs, membership dues and contributions, land leasing and ownership, licenses, stamps, tags, and permits, and plantings.

[5] Respondent could not specify whether expenditure was primarily for either fishing or hunting.

Note: Detail does not add to total because of multiple responses and nonresponse.

Table 24. Wildlife Watching in Michigan by State Residents and Nonresidents Combined: 2011

(Population 16 years old and older. Numbers in thousands)

Participants	Number	Percent
Total participants	**3,199**	**100**
Away from home	958	30
Observe wildlife	950	30
Photograph wildlife	*608	*19
Feed wildlife	*252	*8
Around the home	2,865	90
Observe wildlife	1,693	53
Photograph wildlife	1,686	53
Feed wildlife	2,259	71
Visit parks or natural areas[1]	*402	*13
Maintain plantings or natural areas	*337	*11

* Estimate based on a sample size of 10–29.

[1] Includes visits only to parks or natural areas within one mile of home.

Note: Detail does not add to total because of multiple responses.

Table 25. Participants, Trips, and Days of Participation in Away-From-Home Wildlife Watching in Michigan: 2011

(Population 16 years old and older. Numbers in thousands)

Participants, trips, and days of participation	Activity in Michigan					
	Total, state residents and nonresidents		State residents		Nonresidents	
	Number	Percent	Number	Percent	Number	Percent
PARTICIPANTS						
Total participants	**958**	**100**	***790**	***100**	***168**	***100**
Observe wildlife	950	99	*790	*100	*160	*95
Photograph wildlife	*608	*64	*507	*64	*101	*60
Feed wildlife	*252	*26	...	...	...	...
TRIPS						
Total Trips	**9,611**	**100**	***9,226**	***100**	***385**	***100**
Average days per trip	1	(X)	*1	(X)	*2	(X)
DAYS						
Total days	**10,343**	**100**	***9,498**	***100**	***845**	***100**
Observing wildlife	9,037	87	*8,554	*90	*484	*57
Photographing wildlife	*5,281	*51	*4,912	*52	...	...
Feeding wildlife	*2,415	*23	...	...	...	...
Average days per participant	**11**	**(X)**	***12**	**(X)**	***5**	**(X)**
Observing wildlife	10	(X)	*11	(X)	*3	(X)
Photographing wildlife	*9	(X)	*10	(X)	...	(X)
Feeding wildlife	*10	(X)	...	(X)	...	(X)

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably. (X) Not applicable.

Note: Detail does not add to total because of multiple responses and nonresponse.

Table 26. Away-From-Home Wildlife-Watching Participants by Wildlife Observed, Photographed, or Fed in Michigan: 2011

(Population 16 years old and older. Numbers in thousands)

Wildlife observed, photographed, or fed	Total, state residents and nonresidents		State residents		Nonresidents	
	Number	Percent	Number	Percent	Number	Percent
Total all wildlife	**958**	**100**	***790**	***82**	***168**	***18**
Total birds	**826**	**100**	***674**	***82**	***152**	***18**
Songbirds (cardinals, robins, warblers, etc.)	604	100	*469	*78	*135	*22
Birds of prey (hawks, owls, eagles, etc.)	652	100	*536	*82	*116	*18
Waterfowl (ducks, geese, swans, etc.)	486	100	*373	*77	*113	*23
Other water birds (shorebirds, herons, cranes, etc.)	*407	*100	*332	*81	*75	*19
Other birds (pheasants, turkeys, road runners, etc.)	*346	*100	*305	*88	...	...
Total land mammals	***621**	***100**	***522**	***84**	***99**	***16**
Large land mammals (bears, bison, elk, etc.)	*577	*100	*492	*85	...	...
Small land mammals (prairie dogs, squirrels, etc.)	*395	*100	*334	*85	...	...
Fish (salmon, sharks, etc.)	*232	*100	...	...	...	...
Marine mammals (whales, dolphins, etc.)	...	...	...	...	...	...
Other wildlife (butterflies, turtles, etc.)	*397	*100	*325	*82	...	...

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

Note: Detail does not add to total because of multiple responses.

Table 27. Participation in Wildlife-Watching Activities Around the Home in Michigan: 2011

(State population 16 years old and older. Numbers in thousands)

Around the home	Participants	
	Number	Percent
Total around-the-home participants	**2,865**	**100**
Observe wildlife	1,693	59
Visit parks and natural areas[1]	*402	*14
Photograph wildlife	1,686	59
Feed wildlife	2,259	79
Maintain natural areas	*248	*9
Maintain plantings	*239	*8
Participants Observing Wildlife		
Total, all wildlife	**1,693**	**100**
Birds	1,568	93
Land mammals	1,426	84
Large mammals	920	54
Small mammals	1,202	71
Amphibians or reptiles	*466	*28
Insects or spiders	*523	*31
Fish and other wildlife	*271	*16
Total, 1 day or more	**1,693**	**100**
1 to 10 days	...	...
11 to 50 days	*554	*33
51 to 200 days	*405	*24
201 days or more	*505	*30
Participants Visiting Parks or Natural Areas[1]		
Total, 1 day or more	***402**	***100**
1 to 5 days	...	...
6 to 10 days	...	...
11 days or more	...	...
Participants Photographing Wildlife		
Total, 1 day or more	**1,686**	**100**
1 to 3 days	*610	*36
4 to 10 days	*631	*37
11 or more days	*381	*23
Participants Feeding Wildlife		
Total, all wildlife	**2,259**	**100**
Wild birds	2,223	98
Other wildlife	*631	*28

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

[1] Includes visits only to parks or natural areas within one mile of home.

Note: Detail does not add to total because of multiple responses and nonresponse.

Table 28. Michigan Residents Participating in Wildlife Watching in the United States: 2011

(State population 16 years old and older. Numbers in thousands)

Participants	Number	Percent of participants	Percent of population
Total participants	**3,067**	**100**	**39**
Away from home	855	28	11
Around the home	2,865	93	37
Observe wildlife	1,693	55	22
Photograph wildlife	1,686	55	22
Feed wild birds or other wildlife	2,259	74	29
Maintain plantings or natural areas	*337	*11	*4
Visit parks or natural areas[1]	*402	*13	*5

* Estimate based on a sample size of 10–29.

[1] Includes visits only to parks or natural areas within one mile of home.

Note: Detail does not add to total because of multiple responses. The column showing percent of participants is based on total participants. The column showing percent of population is based on the state population 16 years old and older, including those who did not participate in wildlife watching.

Table 29. Wild Bird Observers and Days of Observation in Michigan by State Residents and Nonresidents: 2011

(Population 16 years old and older. Numbers in thousands)

Observers and days of observation	Total, state residents and nonresidents		State residents		Nonresidents	
	Number	Percent	Number	Percent	Number	Percent
OBSERVERS						
Total bird observers	**2,015**	**100**	**1,871**	**100**	***144**	***100**
Around-the-home observers	1,568	78	1,568	84	(X)	(X)
Away-from-home observers	818	41	*674	*36	*144	*100
DAYS						
Total days observing birds	**212,193**	**100**	**211,708**	**100**	***486**	***100**
Around the home	204,296	96	204,296	96	(X)	(X)
Away from home	7,897	4	*7,411	*4	*486	*100

* Estimate based on a sample size of 10–29. (X) Not applicable.

Note: Detail does not add to total because of multiple responses.

Table 30. Selected Characteristics of Michigan Residents Participating in Wildlife Watching: 2011

(State population 16 years old and older. Numbers in thousands)

Characteristic	Population		Participants								
			Total			Away from home			Around the home		
	Number	Percent	Number	Percent who participated	Percent	Number	Percent who participated	Percent	Number	Percent who participated	Percent
Total persons	**7,787**	**100**	**3,067**	**39**	**100**	**855**	**11**	**100**	**2,865**	**37**	**100**
Population Density of Residence											
Urban	5,647	73	1,854	33	60	*640	*11	*75	1,697	30	59
Rural	2,140	27	1,213	57	40	*215	*10	*25	1,168	55	41
Population Size of Residence											
Metropolitan Statistical Area (MSA)	7,237	93	2,613	36	85	776	11	91	2,412	33	84
1,000,000 or more	2,897	37	972	34	32	*316	*11	*37	816	28	28
250,000 to 999,999	2,310	30	1,024	44	33	...	...	...	1,015	44	35
50,000 to 249,999	2,030	26	617	30	20	*270	*13	*32	*580	*29	*20
Outside MSA	551	7	*454	*82	*15	...	...	...	*454	*82	*16
Sex											
Male	3,427	44	1,316	38	43	*516	*15	*60	1,170	34	41
Female	4,361	56	1,751	40	57	*339	*8	*40	1,696	39	59
Age											
16 to 17 years	*261	*3	...	...	...	...	...	...	...	...	...
18 to 24 years	884	11	...	...	...	...	...	...	...	...	...
25 to 34 years	1,119	14	*378	*34	*12	...	...	...	*315	*28	*11
35 to 44 years	1,214	16	*393	*32	*13	...	...	...	*366	*30	*13
45 to 54 years	1,568	20	*470	*30	*15	...	...	...	*414	*26	*14
55 to 64 years	1,539	20	942	61	31	...	...	...	942	61	33
65 years and older	1,203	15	*809	*67	*26	...	...	...	*772	*64	*27
65 to 74 years	647	8	*440	*68	*14	...	...	...	*440	*68	*15
75 and older	556	7	*369	*66	*12	...	...	...	*331	*60	*12
Ethnicity											
Hispanic	*435	*6	...	...	...	...	...	...	...	...	...
Non-Hispanic	7,352	94	2,902	39	95	702	10	82	2,700	37	94
Race											
White	6,640	85	2,927	44	95	788	12	92	2,726	41	95
African American	759	10	...	...	...	...	...	...	...	...	...
All others	389	5	...	...	...	...	...	...	...	...	...
Annual Household Income											
Less than $20,000	541	7	*188	*35	*6	...	...	...	*188	*35	*7
$20,000 to $29,999	1,083	14	*224	*21	*7	...	...	...	*197	*18	*7
$30,000 to $39,999	604	8	*248	*41	*8	...	...	...	*248	*41	*9
$40,000 to $49,999	615	8	...	...	...	...	...	...	...	...	...
$50,000 to $74,999	880	11	*873	*99	*28	...	...	...	*808	*92	*28
$75,000 to $99,999	1,308	17	*354	*27	*12	...	...	...	*318	*24	*11
$100,000 to $149,999	640	8	*354	*55	*12	...	...	...	*354	*55	*12
$150,000 or more	501	6	...	...	...	...	...	...	...	...	...
Not reported	1,615	21	*532	*33	*17	...	...	...	*495	*31	*17
Education											
11 years or less	588	8	...	...	...	...	...	...	...	...	...
12 years	2,978	38	1,130	38	37	...	...	...	1,057	35	37
1 to 3 years of college	2,289	29	749	33	24	*434	*19	*51	*666	*29	*23
4 years or more of college	1,933	25	1,078	56	35	*233	*12	*27	1,051	54	37

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

Note: Detail does not add to total because of multiple responses and nonresponse. Percent who participated columns show the percent of each row's population who participated in the activity named by the column (the percent of those living in urban areas who participated, etc.). Percent columns show the percent of each column's participants who are described by the row heading (the percent of those who participated who live in urban areas, etc.).

Table 31. Expenditures in Michigan by State Residents and Nonresidents Combined for Wildlife Watching: 2011

(Population 16 years old and older)

Expenditure item	Expenditures (thousands of dollars)	Average per participant (dollars)[1]	Spenders		
			Number (thousands)	Percent of wildlife-watching participants[2]	Average per spender (dollars)[1]
Total, all items	**1,220,816**	**369**	**2,795**	**87**	**437**
TRIP EXPENDITURES					
Total, trip-related	**416,562**	**425**	**965**	**101**	**432**
Food and lodging	233,162	243	816	85	286
Food	164,252	172	813	85	202
Lodging	*68,910	*72	*311	*32	*222
Transportation	151,611	149	927	97	164
Other trip costs[3]	*31,789	*33	*463	*48	*69
EQUIPMENT AND OTHER EXPENDITURES					
Total	**804,254**	**241**	**2,372**	**74**	**339**
Wildlife-watching equipment, total	**428,805**	**131**	**2,152**	**67**	**199**
Binoculars, spotting scopes	...	...	...	...	...
Film and photo processing	...	...	...	...	...
Cameras, special lenses, video cameras, and other photographic equipment, including memory cards	*77,159	*24	*441	*14	*175
Day packs, carrying cases, and special clothing	...	...	...	...	...
Bird food	241,538	75	1,783	56	135
Food for other wildlife	*22,328	*7	*304	*9	*73
Nest boxes, bird houses, bird feeders, and bird baths	31,983	*9	592	18	54
Other equipment (including field guides)	...	...	...	...	...
Auxiliary equipment[4]	...	...	...	...	...
Special equipment[5]	...	...	...	...	...
Magazines, books, and DVDs	*11,800	*4	*384	*12	*31
Membership dues and contributions	*18,783	*6	*329	*10	*57
Land leasing and ownership	...	...	...	...	...
Plantings	*10,486	*3	*230	*7	*46

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

[1] Average expenditures are annual estimates.

[2] Percent of wildlife-watching participants column for trip-related expenditures is based on away-from-home participation. For equipment and other expenditures, the percent of wildlife-watching participants column is based on total wildlife-watching participants.

[3] Includes equipment rental and fees for guides, pack trips, public land use and private land use, boat fuel, other boating costs, and heating and cooking fuel.

[4] Includes tents, tarps, frame packs and other backpacking equipment, other camping equipment, and other auxiliary equipment.

[5] Includes boats, campers, cabins, trail bikes, dune buggies, 4 x 4 vehicles, ATVs, 4-wheelers, snowmobiles, pickups, vans, travel and tent trailers, motor homes, house trailers, recreational vehicles (RVs) and other special equipment.

Note: Detail does not add to total because of multiple responses and nonresponse.

Table 32. Trip and Equipment Expenditures in Michigan for Wildlife Watching by Michigan Residents and Nonresidents: 2011

(Population 16 years old and older)

Expenditure item	Amount (thousands of dollars)	Spenders (thousands)	Average per spender (dollars)[1]	Average per participant (dollars)[1]
STATE RESIDENTS AND NONRESIDENTS				
Total	**1,079,265**	**2,625**	**411**	**332**
Food and lodging	233,162	816	286	243
Transportation	151,611	927	164	149
Other trip costs[2]	*31,789	*463	*69	*33
Equipment[3]	662,703	2,201	301	205
STATE RESIDENTS				
Total	**990,307**	**2,405**	**412**	**324**
Food and lodging	*174,328	*671	*260	*221
Transportation	*132,015	*759	*174	*155
Other trip costs[2]	*29,851	*373	*80	*38
Equipment[3]	654,112	2,133	307	216
NONRESIDENTS				
Total	***88,958**	***220**	***404**	***482**
Food and lodging	*58,834	*145	*406	*351
Transportation	*19,595	*168	*117	*117
Other trip costs[2]	...	...	...	...
Equipment[3]	...	...	...	...

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

[1] Average expenditures are annual estimates.

[2] Includes equipment rental and fees for guides, pack trips, public land use, private land use, boat fuel, other boating costs, and heating and cooking fuel.

[3] Includes wildlife-watching auxiliary and special equipment.

Note: Detail does not add to total because of multiple responses and nonresponse. See Table 33 for detailed listed of expenditure items.

Table 33. Wildlife-Watching Expenditures Both Inside and Outside Michigan by Michigan Residents: 2011

(State population 16 years old and older)

Expenditure item	Expenditures (thousands of dollars)	Average per participant (dollars)[1]	Spenders		
			Number (thousands)	Percent of wildlife-watching participants[2]	Average per spender (dollars)[1]
Total, all items	**1,231,400**	**401**	**2,572**	**84**	**479**
TRIP EXPENDITURES					
Total, trip-related	***390,960**	***457**	***806**	***94**	***485**
Food and lodging	*190,834	*223	*707	*83	*270
Food	*137,152	*160	*707	*83	*194
Lodging	...	...	...	...	...
Transportation	*161,992	*189	*768	*90	*211
Other trip costs[3]	*38,134	*45	*423	*49	*90
EQUIPMENT AND OTHER EXPENDITURES					
Total	**840,440**	**274**	**2,337**	**76**	**360**
Wildlife-watching equipment, total	**469,392**	**153**	**2,091**	**68**	**224**
Binoculars, spotting scopes	...	...	...	...	...
Film and photo processing	...	...	...	...	...
Cameras, special lenses, video cameras, and other photographic equipment, including memory cards	*109,331	*36	*452	*15	*242
Day packs, carrying cases, and special clothing	...	...	...	...	...
Bird food	238,791	78	1,771	58	135
Food for other wildlife	*21,874	*7	*281	*9	*78
Nest boxes, bird houses, bird feeders, and bird baths	*28,268	*9	*557	*18	*51
Other equipment	...	...	...	...	...
Auxiliary equipment[4]	...	...	...	...	...
Special equipment[5]	...	...	...	...	...
Magazines, books, and DVDs	*24,722	*8	*433	*14	*57
Membership dues and contributions	*23,563	*8	*338	*11	*70
Land leasing and ownership	...	...	...	...	...
Plantings	*10,486	*3	*230	*8	*46

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

[1] Average expenditures are annual estimates.

[2] Percent of wildlife-watching participants column for trip-related expenditures is based on away-from-home participation. For equipment and other expenditures, the percent of wildlife-watching participants column is based on total wildlife-watching participants.

[3] Includes equipment rental and fees for guides, pack trips, public land use and private land use, boat fuel, other boating costs, and heating and cooking fuel.

[4] Includes tents, tarps, frame packs and other backpacking equipment, other camping equipment, and other auxiliary equipment.

[5] Includes boats, campers, cabins, trail bikes, dune buggies, 4 x 4 vehicles, ATVs, 4-wheelers, snowmobiles, pickups, vans, travel and tent trailers, motor homes, house trailers, recreational vehicles (RVs) and other special equipment.

Note: Detail does not add to total because of multiple responses and nonresponse.

Table 34. In-State and Out-of-State Expenditures by Michigan Residents for Wildlife Watching: 2011

(State population 16 years old and older)

Expenditure Item	Amount (thousands of dollars)	Spenders (thousands)	Average per spender (dollars)[1]	Average per participant (dollars)[1]
IN MICHIGAN				
Expenditures for wildlife watching, total[2]	**1,106,692**	**2,556**	**433**	**365**
Trip-related expenditures[3]	*336,195	*797	*422	*426
Wildlife-watching equipment[4]	420,214	2,084	202	139
Auxiliary equipment[5]	...	...	...	...
Special equipment[6]	...	...	...	...
Other[7]	116,384	732	159	38
OUT OF STATE				
Expenditures for wildlife watching, total[2]	***101,889**	***184**	***553**	**...**
Trip-related expenditures[3]	...	...	...	...
Wildlife-watching equipment[4]	...	...	...	...
Auxiliary equipment[5]	...	...	...	...
Special equipment[6]	...	...	...	...
Other[7]	...	...	...	...

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably.

[1] Average expenditures are annual estimates.

[2] Information on trip-related expenditures was collected for away-from-home participants only. Equipment and other expenditures are based on information collected from both away-from-home and around-the-home participants.

[3] Includes equipment rental and fees for guides, pack trips, public land use and private land use, boat fuel, other boating costs, and heating and cooking fuel.

[4] Includes binoculars, spotting scopes, cameras, special lenses, videocameras, other photography equipment, memory cards, film and photo processing, commercially prepared and packaged wild bird food, other bulk food used to feed wild birds, food used to feed other wildlife, nest boxes, bird houses, feeders, baths, and other wildife-watching equipment.

[5] Includes tents, tarps, frame packs and other backpacking equipment, other camping equipment, and other auxiliary equipment.

[6] Includes boats, campers, cabins, trail bikes, dune buggies, 4 x 4 vehicles, ATVs, 4-wheelers, snowmobiles, pickups, vans, travel and tent trailers, motor homes, house trailers, recreational vehicles (RVs) and other special equipment.

[7] Includes magazines, books, DVDs, membership dues and contributions, and land leasing and ownership.

Note: Detail does not add to total because of multiple responses and nonresponse.

Table 35. Participation of Michigan Resident Wildlife-Watching Participants in Fishing and Hunting: 2011

(State population 16 years old and older. Numbers in thousands)

Participants	Total wildlife watchers		Wildife-watching activity			
			Away from home		Around the home	
	Number	Percent	Number	Percent	Number	Percent
Total participants	**3,067**	**100**	**855**	**100**	**2,865**	**100**
Wildlife-watching participants who:						
Did not fish or hunt	2,073	68	368	43	1,981	69
Fished or hunted	994	32	487	57	884	31
Fished	946	31	*474	*55	836	29
Hunted	326	11	*175	*20	295	10

* Estimate based on a sample size of 10–29.

Note: Detail does not add to total because of multiple responses and nonresponse.

Table 36. Participation of Michigan Resident Sportspersons in Wildlife-Watching Activities: 2011

(State population 16 years old and older. Numbers in thousands)

Sportspersons	Sportspersons		Anglers		Hunters	
	Number	Percent	Number	Percent	Number	Percent
Total sportspersons	**1,636**	**100**	**1,465**	**100**	**507**	**100**
Sportspersons who:						
Did not engage in wildlife-watching activities	642	39	520	35	*182	*36
Engaged in wildlife-watching activities	994	61	946	65	326	64
Away from home	487	30	*474	*32	*175	*34
Around the home	884	54	836	57	295	58

* Estimate based on a sample size of 10–29.

Note: Detail does not add to total because of multiple responses and nonresponse.

Table 37. Participation in Wildlife-Related Recreation by State Residents Both Inside and Outside Their Resident State: 2011

(Population 16 years old and older. Numbers in thousands)

Participant's state of residence	Population	Total participants		Sportspersons		Wildlife-watching participants	
		Number	Percent of population	Number	Percent of population	Number	Percent of population
United States, total	**239,313**	**89,584**	**37**	**37,397**	**16**	**71,776**	**30**
Alabama	3,664	1,484	40	744	20	1,079	29
Alaska	526	334	64	235	45	247	47
Arizona	5,084	1,629	32	721	14	1,281	25
Arkansas	2,238	1,102	49	572	26	828	37
California	28,562	7,351	26	1,898	7	6,475	23
Colorado	3,946	1,835	47	727	18	1,456	37
Connecticut	2,781	1,196	43	347	12	1,093	39
Delaware	699	258	37	101	14	209	30
Florida	14,855	4,621	31	2,068	14	3,598	24
Georgia	7,459	2,720	36	981	13	2,206	30
Hawaii	995	222	22	108	11	161	16
Idaho	1,172	638	54	331	28	464	40
Illinois	9,988	3,465	35	1,487	15	2,784	28
Indiana	4,965	2,122	43	842	17	1,681	34
Iowa	2,363	1,086	46	586	25	780	33
Kansas	2,163	1,006	47	453	21	776	36
Kentucky	3,376	1,449	43	643	19	1,221	36
Louisiana	3,449	1,360	39	802	23	840	24
Maine	1,066	519	49	233	22	401	38
Maryland	4,480	1,388	31	426	9	1,224	27
Massachusetts	5,320	1,777	33	464	9	1,530	29
Michigan	7,787	3,709	48	1,636	21	3,067	39
Minnesota	4,133	2,093	51	1,400	34	1,498	36
Mississippi	2,220	1,012	46	700	32	630	28
Missouri	4,667	2,096	45	1,001	21	1,645	35
Montana	777	334	43	223	29	258	33
Nebraska	1,387	497	36	258	19	362	26
Nevada	2,024	592	29	171	8	504	25
New Hampshire	1,066	470	44	168	16	388	36
New Jersey	6,852	2,047	30	709	10	1,708	25
New Mexico	1,551	589	38	252	16	486	31
New York	15,503	5,090	33	1,980	13	4,081	26
North Carolina	7,264	2,708	37	1,394	19	2,124	29
North Dakota	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Ohio	8,999	4,078	45	1,603	18	3,155	35
Oklahoma	2,828	1,534	54	770	27	1,233	44
Oregon	3,061	1,387	45	444	15	1,239	40
Pennsylvania	10,036	4,036	40	1,277	13	3,329	33
Rhode Island	848	307	36	94	11	270	32
South Carolina	3,555	1,266	36	615	17	944	27
South Dakota	631	361	57	190	30	267	42
Tennessee	4,945	2,116	43	923	19	1,733	35
Texas	18,681	5,888	32	2,711	15	4,263	23
Utah	2,036	779	38	406	20	558	27
Vermont	512	315	62	134	26	273	53
Virginia	6,136	2,565	42	842	14	2,212	36
Washington	5,293	2,307	44	968	18	1,932	37
West Virginia	1,464	859	59	322	22	751	51
Wisconsin	4,460	2,481	56	1,198	27	2,152	48
Wyoming	424	249	59	145	34	182	43

(NA) Not available.

Note: Detail does not add to total because of multiple responses. U.S. totals include responses from participants residing in the District of Columbia, as described in Appendix D.

Table 38. Anglers and Hunters by Sportsperson's State of Residence: 2011

(Population 16 years old and older. Numbers in thousands)

Sportsperson's state of residence	Population	Fished or hunted		Fished only		Hunted only		Fished and hunted	
		Number	Percent of population	Number	Percent of population	Number	Percent of population	Number	Percent of population
United States, total	**239,313**	**37,397**	**16**	**23,714**	**10**	**4,285**	**2**	**9,389**	**4**
Alabama	3,664	744	20	252	7	*228	*6	264	7
Alaska	526	235	45	129	25	*24	*5	82	16
Arizona	5,084	721	14	462	9	*135	*3	*124	*2
Arkansas	2,238	572	26	252	11	*105	*5	214	10
California	28,562	1,898	7	1,431	5	198	1	269	1
Colorado	3,946	727	18	567	14	*60	*2	99	3
Connecticut	2,781	347	12	265	10	...	...	76	3
Delaware	699	101	14	78	11	*9	*1	*14	*2
Florida	14,855	2,068	14	1,731	12	*78	*1	252	2
Georgia	7,459	981	13	672	9	*138	*2	171	2
Hawaii	995	108	11	85	9	...	...	*21	*2
Idaho	1,172	331	28	169	14	...	...	*119	*10
Illinois	9,988	1,487	15	976	10	*252	*3	260	3
Indiana	4,965	842	17	465	9	*56	*1	322	6
Iowa	2,363	586	25	369	16	*64	*3	152	6
Kansas	2,163	453	21	275	13	*18	*1	159	7
Kentucky	3,376	643	19	327	10	*151	*4	165	5
Louisiana	3,449	802	23	511	15	*69	*2	222	6
Maine	1,066	233	22	92	9	*37	*3	104	10
Maryland	4,480	426	9	337	8	...	...	*72	*2
Massachusetts	5,320	464	9	398	7	...	...	59	1
Michigan	7,787	1,636	21	1,128	14	*170	*2	337	4
Minnesota	4,133	1,400	34	925	22	*71	*2	403	10
Mississippi	2,220	700	32	263	12	*96	*4	340	15
Missouri	4,667	1,001	21	507	11	132	3	363	8
Montana	777	223	29	114	15	*30	*4	78	10
Nebraska	1,387	258	19	143	10	*61	*4	54	4
Nevada	2,024	171	8	122	6	*15	*1	*34	*2
New Hampshire	1,066	168	16	125	12	...	...	*39	*4
New Jersey	6,852	709	10	593	9	*30	*(Z)	86	1
New Mexico	1,551	252	16	185	12	*21	*1	*47	*3
New York	15,503	1,980	13	1,241	8	*172	*1	567	4
North Carolina	7,264	1,394	19	1,077	15	*88	*1	230	3
North Dakota	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Ohio	8,999	1,603	18	1,075	12	*168	*2	360	4
Oklahoma	2,828	770	27	551	19	...	...	*193	*7
Oregon	3,061	444	15	263	9	*58	*2	*123	*4
Pennsylvania	10,036	1,277	13	574	6	269	3	434	4
Rhode Island	848	94	11	77	9	...	...	16	2
South Carolina	3,555	615	17	377	11	*42	*1	196	6
South Dakota	631	190	30	*58	*9	*27	*4	106	17
Tennessee	4,945	923	19	637	13	*91	*2	196	4
Texas	18,681	2,711	15	1,631	9	*356	*2	724	4
Utah	2,036	406	20	245	12	*55	*3	106	5
Vermont	512	134	26	64	12	30	6	41	8
Virginia	6,136	842	14	488	8	135	2	219	4
Washington	5,293	968	18	749	14	*54	*1	165	3
West Virginia	1,464	322	22	111	8	*83	*6	128	9
Wisconsin	4,460	1,198	27	434	10	*260	*6	504	11
Wyoming	424	145	34	69	16	*30	*7	46	11

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably. (NA) Not available. (Z) Less than 0.5 percent.

Note: U.S. totals include responses from participants residing in the District of Columbia, as described in Appendix D.

Table 39. Participation in Wildlife-Related Recreation in Each State by Both Residents and Nonresidents of the State: 2011

(Population 16 years old and older. Numbers in thousands)

State where activity took place	Total participants		Sportspersons		Wildlife-watching participants	
	Number	Percent	Number	Percent	Number	Percent
United States, total	**89,584**	**100**	**37,397**	**42**	**71,776**	**80**
Alabama	1,710	100	948	55	1,114	65
Alaska	1,005	100	563	56	640	64
Arizona	2,088	100	786	38	1,566	75
Arkansas	1,277	100	696	55	852	67
California	7,823	100	1,820	23	6,733	86
Colorado	2,280	100	919	40	1,782	78
Connecticut	1,327	100	350	26	1,178	89
Delaware	338	100	177	52	243	72
Florida	6,258	100	3,152	50	4,308	69
Georgia	3,009	100	1,059	35	2,393	80
Hawaii	464	100	158	34	358	77
Idaho	837	100	534	64	558	67
Illinois	3,696	100	1,309	35	3,019	82
Indiana	2,281	100	867	38	1,719	75
Iowa	1,221	100	598	49	837	69
Kansas	1,123	100	527	47	792	71
Kentucky	1,689	100	713	42	1,319	78
Louisiana	1,641	100	904	55	1,010	62
Maine	1,098	100	413	38	838	76
Maryland	1,582	100	445	28	1,362	86
Massachusetts	2,181	100	538	25	1,828	84
Michigan	4,278	100	1,938	45	3,199	75
Minnesota	2,473	100	1,649	67	1,577	64
Mississippi	1,296	100	782	60	781	60
Missouri	2,478	100	1,277	52	1,716	69
Montana	558	100	335	60	402	72
Nebraska	556	100	289	52	384	69
Nevada	728	100	163	22	643	88
New Hampshire	781	100	247	32	630	81
New Jersey	2,413	100	794	33	1,875	78
New Mexico	765	100	304	40	566	74
New York	5,473	100	2,109	39	4,239	77
North Carolina	3,360	100	1,631	49	2,432	72
North Dakota	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Ohio	4,237	100	1,561	37	3,197	75
Oklahoma	1,670	100	779	47	1,263	76
Oregon	1,752	100	703	40	1,440	82
Pennsylvania	4,504	100	1,424	32	3,598	80
Rhode Island	398	100	179	45	308	77
South Carolina	1,665	100	847	51	1,103	66
South Dakota	640	100	430	67	384	60
Tennessee	2,554	100	994	39	1,955	77
Texas	6,304	100	2,713	43	4,376	69
Utah	1,005	100	493	49	717	71
Vermont	507	100	254	50	370	73
Virginia	3,226	100	1,068	33	2,509	78
Washington	2,717	100	1,005	37	2,168	80
West Virginia	1,170	100	447	38	850	73
Wisconsin	3,380	100	1,554	46	2,359	70
Wyoming	771	100	390	51	518	67

* Estimate based on a sample size of 10–29. (NA) Not available.

Note: Detail does not add to total because of multiple responses. U.S. totals include responses from participants residing in the District of Columbia, as described in Appendix D.

Table 40. Anglers and Hunters by State Where Fishing or Hunting Took Place: 2011

(Population 16 years old and older. Numbers in thousands)

State where fishing or hunting took place	Anglers						Hunters					
	Total anglers, residents and nonresidents		State residents		Nonresidents		Total hunters, residents and nonresidents		State residents		Nonresidents	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
United States, total	**33,112**	**100**	**30,037**	**91**	**6,964**	**21**	**13,674**	**100**	**12,890**	**94**	**1,942**	**14**
Alabama	683	100	473	69	210	31	535	100	492	92	*44	*8
Alaska	538	100	211	39	327	61	125	100	104	83	...	...
Arizona	637	100	533	84	*104	*16	269	100	225	83	*45	*17
Arkansas	555	100	458	83	*97	*17	363	100	316	87	...	...
California	1,674	100	1,576	94	98	6	394	100	377	96	...	...
Colorado	767	100	593	77	175	23	259	100	144	55	*115	*45
Connecticut	342	100	277	81	*65	*19	50	100	46	93	...	...
Delaware	166	100	59	36	*107	*64	23	100	19	84	...	...
Florida	3,092	100	1,895	61	1,197	39	242	100	215	89	...	...
Georgia	829	100	764	92	*65	*8	392	100	293	75	*98	*25
Hawaii	157	100	104	66	...	...	*23	*100	*23	*100	...	...
Idaho	447	100	238	53	208	47	246	100	*162	*66	*85	*34
Illinois	1,044	100	955	92	*88	*8	512	100	459	90	...	...
Indiana	801	100	720	90	*81	*10	392	100	377	96	...	...
Iowa	473	100	416	88	*58	*12	253	100	200	79	...	...
Kansas	400	100	372	93	*28	*7	283	100	170	60	*112	*40
Kentucky	554	100	451	81	*103	*19	347	100	316	91	...	...
Louisiana	825	100	700	85	*125	*15	277	100	253	91	...	...
Maine	341	100	193	56	149	44	181	100	141	78	*40	*22
Maryland	426	100	347	81	80	19	88	100	*69	*78	*19	*22
Massachusetts	532	100	377	71	155	29	56	100	52	93	...	...
Michigan	1,744	100	1,397	80	347	20	529	100	501	95	...	...
Minnesota	1,562	100	1,303	83	259	17	477	100	457	96	...	...
Mississippi	651	100	600	92	...	...	483	100	436	90	...	...
Missouri	1,071	100	827	77	244	23	576	100	477	83	*100	*17
Montana	267	100	185	69	82	31	150	100	104	70	*46	*30
Nebraska	207	100	177	85	...	...	128	100	110	86	...	...
Nevada	147	100	114	78	...	...	43	100	39	91	...	...
New Hampshire	228	100	153	67	75	33	56	100	42	74	*14	*26
New Jersey	766	100	509	66	*257	*34	94	100	93	99	...	...
New Mexico	278	100	213	77	*65	*23	69	100	64	93	...	...
New York	1,882	100	1,585	84	297	16	823	100	739	90	*84	*10
North Carolina	1,525	100	1,196	78	329	22	335	100	259	77	*76	*23
North Dakota	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Ohio	1,342	100	1,257	94	*85	*6	553	100	516	93	*37	*7
Oklahoma	729	100	680	93	*49	*7	244	100	219	90	...	...
Oregon	638	100	373	59	264	41	196	100	181	92	...	...
Pennsylvania	1,101	100	891	81	210	19	775	100	699	90	*76	*10
Rhode Island	175	100	79	45	96	55	20	100	15	77	...	...
South Carolina	744	100	561	75	*182	*25	254	100	180	71	*74	*29
South Dakota	268	100	156	58	*112	*42	270	100	127	47	144	53
Tennessee	826	100	709	86	*117	*14	375	100	276	74	...	...
Texas	2,246	100	2,133	95	*114	*5	1,147	100	1,080	94	*67	*6
Utah	414	100	343	83	*70	*17	193	100	158	82	*35	*18
Vermont	207	100	95	46	112	54	90	100	66	74	...	...
Virginia	833	100	649	78	184	22	432	100	326	75	*106	*25
Washington	938	100	835	89	*103	*11	219	100	200	92	...	...
West Virginia	305	100	222	73	*84	*27	247	100	184	74	...	...
Wisconsin	1,247	100	910	73	337	27	895	100	763	85	*131	*15
Wyoming	303	100	110	36	*193	*64	140	100	76	54	*64	*46

* Estimate based on a sample size of 10–29. … Sample size too small (less than 10) to report data reliably. (NA) Not available.

Note: For the U.S. row, detail does not add to total because of multiple responses. U.S. totals include responses from participants residing in the District of Columbia, as described in Appendix D.

Appendix A

Appendix A. Definitions

Annual household income—Total 2011 income of household members before taxes and other deductions.

Around-the-home wildlife watching—Activity within 1 mile of home with one of six primary purposes: (1) taking special interest in or trying to identify birds or other wildlife; (2) photographing wildlife; (3) feeding birds or other wildlife; (4) maintaining natural areas of at least one-quarter acre for the benefit of wildlife; (5) maintaining plantings (such as shrubs and agricultural crops) for the benefit of wildlife; and (6) visiting parks and natural areas to observe, photograph, or feed wildlife.

Auxiliary equipment—Equipment owned primarily for wildlife-associated recreation. For the sportspersons section, these include sleeping bags, packs, duffel bags, tents, binoculars and field glasses, special fishing and hunting clothing, foul weather gear, boots and waders, maintenance and repair of equipment, and processing and taxidermy costs. For the wildlife-watching section, these include tents, tarps, frame packs, backpacking and other camping equipment, and blinds. For both sportspersons and wildlife watchers, it also includes electronic auxiliary equipment such as Global Positioning Systems.

Away-from-home wildlife watching—Trips or outings at least 1 mile from home for the primary purpose of observing, photographing, or feeding wildlife. Trips to zoos, circuses, aquariums, and museums are not included.

Big game—Bear, deer, elk, moose, wild turkey, and similar large animals that are hunted.

Census Divisions

East North Central
Illinois
Indiana
Michigan
Ohio
Wisconsin

East South Central
Alabama
Kentucky
Mississippi
Tennessee

Middle Atlantic
New Jersey
New York
Pennsylvania

Mountain
Arizona
Colorado
Idaho
Montana
Nevada
New Mexico
Utah
Wyoming

New England
Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

Pacific
Alaska
California
Hawaii
Oregon
Washington

South Atlantic
Delaware
District of Columbia
Florida
Georgia
Maryland
North Carolina
South Carolina
Virginia
West Virginia

West North Central
Kansas
Iowa
Minnesota
Missouri
Nebraska
North Dakota
South Dakota

West South Central
Arkansas
Louisiana
Oklahoma
Texas

Day—Any part of a day spent participating in a given activity. For example, if someone hunted two hours one day and three hours another day, it would be reported as two days of hunting. If someone hunted two hours in the morning and three hours in the afternoon of the same day, it would be considered one day of hunting.

Education—The highest completed grade of school or year of college.

Expenditures—Money spent in 2011 for wildlife-related recreation trips in the United States, wildlife-related recreational equipment purchased in the United States, and other items. The "other items" were books, magazines, and DVDs; membership dues and contributions, land leasing or owning; hunting and fishing licenses; and plantings, all for the purpose of wildlife-related recreation. Expenditures included both money spent by participants for themselves and the value of gifts they received.

Fishing—The sport of catching or attempting to catch fish with a hook and line, bow and arrow, or spear; it also includes catching or gathering shellfish (clams, crabs, etc.); and the noncommercial seining or netting of fish, unless the fish are for use as bait. For example, seining for smelt is fishing, but seining for bait minnows is not included as fishing.

Fishing equipment—Items owned primarily for fishing:

- Rods, reels, poles, and rodmaking components
- Lines and leaders
- Artificial lures, flies, baits, and dressing for flies or lines
- Hooks, sinkers, swivels, and other items attached to a line, except lures and baits
- Tackle boxes
- Creels, stringers, fish bags, landing nets, and gaff hooks
- Minnow traps, seines, and bait containers
- Depth finders, fish finders, and other electronic fishing devices
- Ice fishing equipment
- Other fishing equipment

Freshwater—Reservoirs, lakes, ponds, and the nontidal portions of rivers and streams.

Great Lakes fishing—Fishing in Lakes Superior, Michigan, Huron, St. Clair, Erie, and Ontario, their connecting waters such as the St. Mary's River system, Detroit River, St. Clair River, and the Niagara River, and the St. Lawrence River south of the bridge at Cornwall, New York. Great Lakes fishing includes fishing in tributaries of the Great Lakes for smelt, steelhead, and salmon.

Home—The starting point of a wildlife-related recreational trip. It may be a permanent residence or a temporary or seasonal residence such as a cabin.

Hunting—The sport of shooting or attempting to shoot wildlife with firearms or archery equipment.

Hunting equipment—Items owned primarily for hunting:

- Rifles, shotguns, muzzleloaders, and handguns
- Archery equipment
- Telescopic sights
- Decoys and game calls
- Ammunition
- Hand loading equipment
- Hunting dogs and associated costs
- Other hunting equipment

Land leasing and owning—Leasing or owning land either singly or in cooperation with others for the primary purpose of fishing, hunting, or wildlife watching on it.

Maintain natural areas—To set aside 1/4 acre or more of natural environment, such as wood lots or open fields, for the primary purpose of benefiting wildlife.

Maintain plantings—To introduce or encourage the growth of food and cover plants for the primary purpose of benefiting wildlife.

Metropolitan Statistical Area (MSA)—A Metropolitan Statistical Area is a grouping of one or more counties or equivalent entities that contain at least one urbanized area of 50,000 or more inhabitants. The "Outside MSA" classification include census-defined Micropolitan Statistical Areas (or Micro areas). A Micro area is defined as a grouping of one or more counties or equivalent entities that contain at least one urban cluster of at least 10,000 but less than 50,000 inhabitants. Refer to <www.census.gov /population/metro/about/>, for a more detailed definition of the Metropolitan Statistical Area.

Migratory birds—Birds that regularly migrate from one region or climate to another such as ducks, geese, and doves and other birds that may be hunted.

Multiple responses—The term used to reflect the fact that individuals or their characteristics fall into more than one reporting category. An example of a big game hunter who hunted for deer and elk demonstrates the effect of multiple responses. In this case, adding the number of deer hunters (one) and elk hunters (one) would overstate the number of big game hunters (one) because deer and elk hunters are not mutually exclusive categories. In contrast, for example, total participants is the sum of male and female participants, because "male" and "female" are mutually exclusive categories.

Nonresidents—Individuals who do not live in the State being reported. For example, a person living in Texas who watches whales in California is a nonresidential wildlife-watcher in California.

Nonresponse—A term used to reflect the fact that some Survey respondents provide incomplete sets of information. For example, a Survey respondent may have been unable to identify the primary type of hunting for which a gun was bought. Total hunting expenditure estimates will include the gun purchase, but it will not appear as spending for big game or any other type of hunting. Nonresponses result in reported totals that are greater than the sum of their parts.

Observe—To take special interest in or try to identify birds, fish or other wildlife.

Other animals—Coyotes, crows, foxes, groundhogs, prairie dogs, raccoons, alligators, and similar animals that can be legally hunted and are not classified as big game, small game, or migratory birds. They may be classified as unprotected or predatory animals by the State in which they are hunted. Feral pigs are classified as "other animals" in all States except Hawaii, where they are considered big game.

Participants—Individuals who engage in fishing, hunting, or a wildlife-watching activity. Unless otherwise stated, a person has to have hunted, fished, or wildlife watched in 2011 to be considered a participant.

Plantings—See "Maintain plantings."

Primary purpose—The principal motivation for an activity, trip, or expenditure.

Private land—Land owned by a business, nongovernmental organization, private individual, or a group of individuals such as an association or club.

Public land—Land that is owned by local governments (such as county parks and municipal watersheds),

State governments (such as State parks and wildlife management areas), or the federal government (such as National Forests, Recreational Areas, and Wildlife Refuges).

Residents—Individuals who lived in the State being reported. For example, a person who lives in California and watches whales in California is a residential wildlife watcher in California.

Rural—All territory, population, and housing units located outside of urbanized areas and urban clusters, as determined by the U.S. Census Bureau.

Saltwater—Oceans, tidal bays and sounds, and the tidal portions of rivers and streams.

Screening interviews—The first Survey contact with a sample household. Screening interviews are conducted with a household representative to identify respondents who are eligible for in-depth interviews. Screening interviews gather data such as age and sex about individuals in the households. Further information on screening interviews is available on page vii in the "Survey Background and Method" section of this report.

Small game—Grouse, pheasants, quail, rabbits, squirrels, and similar small animals for which States have small game seasons and bag limits.

Special equipment—Big-ticket equipment items that are owned primarily for wildlife-related recreation:

- Bass boats
- Other types of motor boats
- Canoes and other types of nonmotor boats
- Boat motors, boat trailer/hitches, and other boat accessories
- Pickups, campers, vans, travel or tent trailers, motor homes, house trailers, recreational vehicles (RVs)
- Cabins
- Off-the-road vehicles such as trail bikes, all terrain vehicles (ATVs), dune buggies, four-wheelers, 4x4 vehicles, and snowmobiles
- Other special equipment

Spenders—Individuals who spent money on fishing, hunting, or wildlife-watching activities or equipment and also participated in those activities.

Sportspersons—Individuals who engaged in fishing, hunting, or both.

Trip—An outing involving fishing, hunting, or wildlife watching. A trip may begin from an individual's principal residence or from another place, such as a vacation home or the home of a relative. A trip may last an hour, a day, or many days.

Type of fishing—There are three types of fishing: (1) freshwater except Great Lakes, (2) Great Lakes, and (3) saltwater.

Type of hunting—There are four types of hunting: (1) big game, (2) small game, (3) migratory bird, and (4) other animal.

Unspecified expenditure—An item that was purchased for use in both fishing and hunting, rather than primarily one or the other. Auxiliary equipment, special equipment, magazines and books, and membership dues and contributions are the items for which a purchase could be categorized as "unspecified."

Urban—All territory, population, and housing units located within boundaries that encompass densely settled territory, consisting of core census block groups or blocks that have a population density of at least 1,000 people per square mile and surrounding census blocks that have an overall density of at least 500 people per square mile. Under certain conditions, less densely settled territory may be included, as determined by the Census Bureau.

Visit parks or natural areas—A visit to places accessible to the public and that are owned or leased by a governmental entity, nongovernmental organization, business, or a private individual or group such as an association or club.

Wildlife—Animals such as birds, fish, insects, mammals, amphibians, and reptiles that are living in natural or wild environments. Wildlife does not include animals living in aquariums, zoos, and other artificial surroundings or domestic animals such as farm animals or pets.

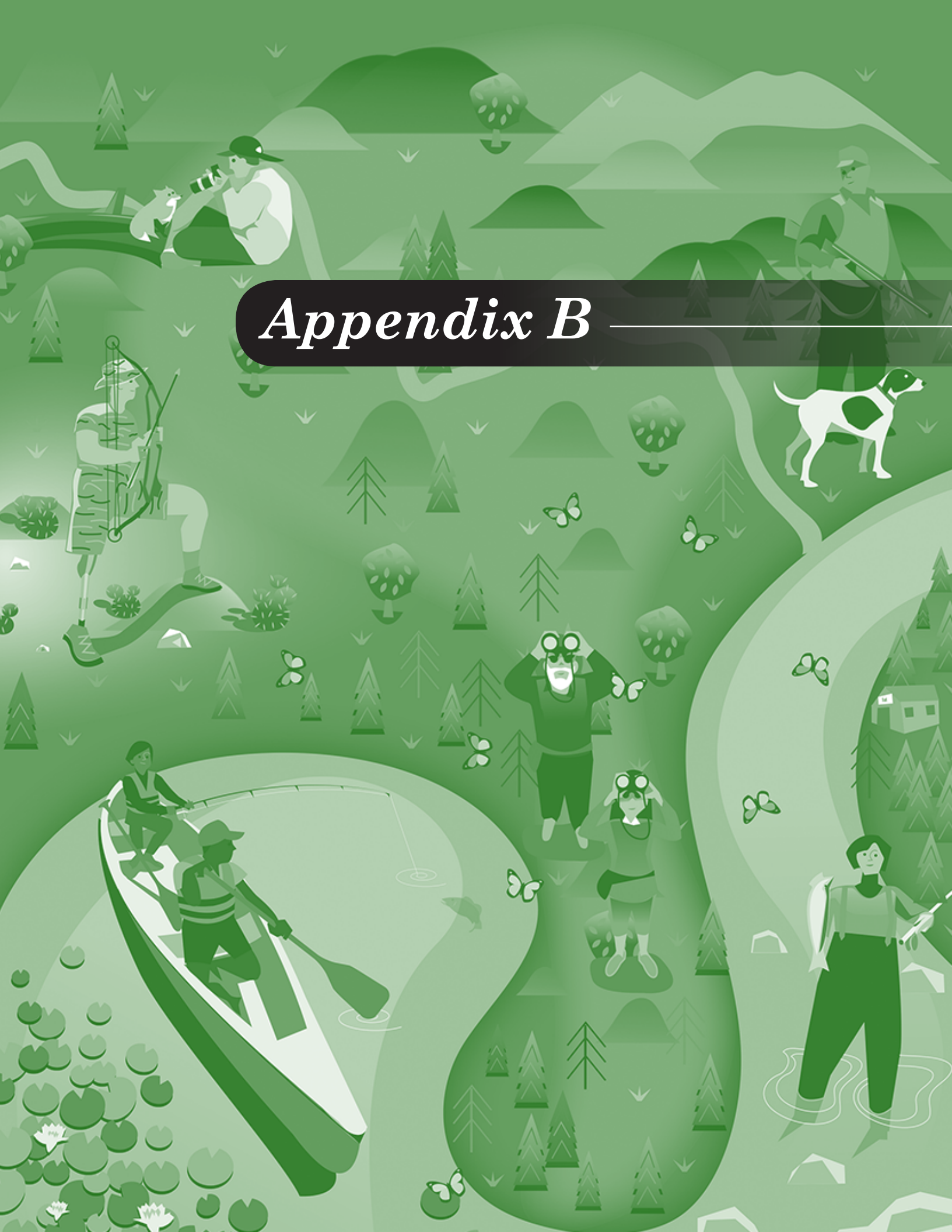
Wildlife observed, photographed, or fed—Examples of species that wildlife watchers observe, photograph, and/or feed are (1) *Wild birds*—songbirds such as cardinals, robins, warblers, jays, buntings, and sparrows; birds of prey such as hawks, owls, eagles, and falcons; waterfowl such as ducks, geese, and swans; other water birds such as shorebirds, herons, pelicans, and cranes; and other birds such as pheasants, turkeys, road runners, and woodpeckers; (2) *Land mammals*—large land mammals such as bears, bison, deer, moose, and elk; small land mammals such as squirrels, foxes, prairie dogs, and rabbits; (3) *Fish* such as salmon, sharks, and groupers; (4) *Marine mammals* such as whales, dolphins, and manatees; and (5) *Other wildlife* such as butterflies, turtles, spiders, and snakes.

Wildlife-related recreation—Recreational fishing, hunting, and wildlife watching.

Wildlife watching—There are six types of wildlife watching: (1) closely observing, (2) photographing, (3) feeding, (4) visiting parks or natural areas, (5) maintaining plantings, and (6) maintaining natural areas. These activities must be the primary purpose of the trip or the around-the-home undertaking.

Wildlife-watching equipment—Items owned primarily for observing, photographing, or feeding wildlife:

- Binoculars and spotting scopes
- Cameras, video cameras, special lenses, and other photographic equipment
- Film and developing
- Commercially prepared and packaged wild bird food
- Other bulk food used to feed wild birds
- Food for other wildlife
- Nest boxes, bird houses, feeders, and baths
- Day packs, carrying cases, and special clothing
- Other items such as field guides and maps



Appendix B

Appendix B. 2010 Participation of 6- to 15-Year-Olds: Data From Screening Interviews

The 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation was carried out in two phases. The first (or screening) phase began in April 2011. The main purpose of this phase was to collect information about all persons 16 years old and older in order to develop a sample of potential sportspersons and wildlife watchers for the second (or detailed) phase. However, information was also collected on the number of persons 6 to 15 years old who participated in wildlife-related recreation activities in 2010.

It is important to emphasize that the information reported from the 2011 screen relates to activity only up to and including 2010. Also, these data are reported by one household respondent speaking for all household members rather than the actual participants. In addition, these data are based on long-term recall (at least a 12-month recall), which has been found in Survey research (see *Investigation of Possible Recall/Reference Period Bias in National Surveys of Fishing, Hunting and Wildlife-Associated Recreation, December 1989, Westat, Inc.*) to add bias to the resulting estimates. In many cases, longer recall periods result in overestimating participation and expenditures for wildlife-related recreation.

Tables B-1 through B-4 report data on 6- to 15-year-old participants in 2010. Detailed expenditures and recreational activity data were not gathered for the 6- to 15-year-old participants.

Because of differences in methodologies of the screening and the detailed phases of the 2011 Survey, the estimates of the two phases are not comparable. Only participants 16 years old and older were eligible for the detailed phase. The screening phase covered activity for 2010 or earlier; the detailed phase has estimates for only 2011. The detailed phase was a series of interviews of the actual participants conducted at 4- and 8-month intervals. The screening phase was a single interview of one household respondent who reported household events with one year or more recall. The shorter recall period of the detailed phase enabled better data accuracy.

Table B-1. Michigan Residents 6 to 15 Years Old Participating in Fishing and Hunting Both Inside and Outside Michigan: 2010

(Population 6 to 15 years old. Numbers in thousands)

Sportspersons	Sportspersons 6 to 15 years old		
	Number	Percent of sportspersons	Percent of population
Total sportspersons	**449**	**100**	**35**
Total anglers	**425**	**95**	**33**
Fished only	*281	*62	*22
Fished and hunted	...	...	...
Total hunters	**...**	**...**	**...**
Hunted only	...	...	...
Hunted and fished	...	...	...

* Estimate based on a sample size of 10–29. ... Sample size too small (less than 10) to report data reliably.

Note: Detail does not add to total because of multiple responses. Column showing percent of sportspersons is based on the "Total sportspersons" row. Column showing percent of population is based on the state population 6 to 15 years old, including those who did not fish or hunt. Data reported on this table are from screening interviews in which one adult household member responded for household members 6 to 15 years old. The screening interview required the respondent to recall 12 months worth of activity. Includes state residents who fished or hunted only in other countries.

Table B-2. Selected Characteristics of Michigan Resident Anglers and Hunters 6 to 15 Years Old: 2010

(Population 6 to 15 years old. Numbers in thousands)

Characteristic	Population		Sportspersons (fished or hunted)			Anglers			Hunters		
	Number	Percent	Number	Percent who participated	Percent	Number	Percent who participated	Percent	Number	Percent who participated	Percent
Total persons	**1,279**	**100**	**449**	**35**	**100**	**425**	**33**	**100**	**...**	**...**	**...**
Population Density of Residence											
Urban	1,048	82	*351	*33	*78	*351	*33	*83	...	...	...
Rural	231	18	*98	*43	*22	*74	*32	*17	...	...	...
Population Size of Residence											
Metropolitan Statistical Area (MSA)	1,259	98	437	35	97	*417	*33	*98	...	...	...
1,000,000 or more	532	42	...	...	...	...	...	...	...	...	...
250,000 to 999,999	*360	*28	...	...	...	...	...	...	...	...	...
50,000 to 249,999	367	29	*108	*30	*24	*98	*27	*23	...	...	...
Outside MSA	...	...	...	...	...	...	...	...	...	...	...
Age											
6 to 8 years	*261	*20	...	...	...	...	...	...	...	...	...
9 to 11 years	*287	*22	*102	*35	*23	*92	*32	*22	...	...	...
12 to 15 years	731	57	*216	*29	*48	*201	*27	*47	...	...	...
Sex											
Male	652	51	*343	*53	*76	*327	*50	*77	...	...	...
Female	627	49	*106	*17	*24	*97	*16	*23	...	...	...
Ethnicity											
Hispanic	...	...	...	...	...	...	...	...	...	...	...
Non-Hispanic	1,198	94	379	32	84	354	30	83	...	...	...
Race											
White	971	76	449	46	100	425	44	100	...	...	...
African American	*273	*21	...	...	...	...	...	...	...	...	...
All others	...	...	...	...	...	...	...	...	...	...	...
Annual Household Income											
Less than $20,000	*61	*5	...	...	...	...	...	...	...	...	...
$20,000 to $29,999	...	...	...	...	...	...	...	...	...	...	...
$30,000 to $39,999	*150	*12	...	...	...	...	...	...	...	...	...
$40,000 to $49,999	...	...	...	...	...	...	...	...	...	...	...
$50,000 to $74,999	*116	*9	...	...	...	...	...	...	...	...	...
$75,000 to $99,999	*388	*30	...	...	...	...	...	...	...	...	...
$100,000 or more	*204	*16	*104	*51	*23	...	...	...	...	...	...
Not reported	*217	*17	...	...	...	...	...	...	...	...	...

* Estimate based on a sample size of 10–29. ... Sample size too small (less than 10) to report data reliably.

Note: Percent who participated columns show the percent of each row's population who participated in the activity named by the column (the percent of those living in urban areas who wildlife watched, etc.). Remaining percent columns show the percent of each column's participants who are described by the row heading (the percent of wildlife watchers who lived in urban areas, etc.). Data reported on this table are from screening interviews in which one adult household member responded for household members 6 to 15 years old. The screening interview required the respondent to recall 12 months worth of activity. Includes state residents who wildlife watched only in other countries.

Table B-3. Michigan Residents 6 to 15 Years Old Participating in Wildlife Watching Both Inside and Outside Michigan: 2010

(Population 6 to 15 years old. Numbers in thousands)

Participants	Number	Percent of participants	Percent of population
Total participants	**413**	**100**	**32**
Away from home	*198	*48	*15
Around the home	375	91	29
Observe wildlife	365	88	29
Photograph wildlife	...	...	...
Feed wild birds or other wildlife	*99	*24	*8
Maintain plantings or natural areas	...	...	...

* Estimate based on a sample size of 10–29. ... Sample size too small (less than 10) to report data reliably.

Note: Detail does not add to total because of multiple responses. The column showing percent of participation is based on total participants. The column showing percent of population is based on the state population 6 to 15 years old, including those who did not participate in wildlife watching. Data reported on this table are from screening interviews in which one adult household member responded for all household members 6 to 15 years old. The screening interview required the respondent to recall 12 months worth of activity. Includes persons who wildlife watched only in other countries.

Table B-4. Selected Characteristics of Michigan Resident Wildlife Watchers 6 to 15 Years Old: 2010

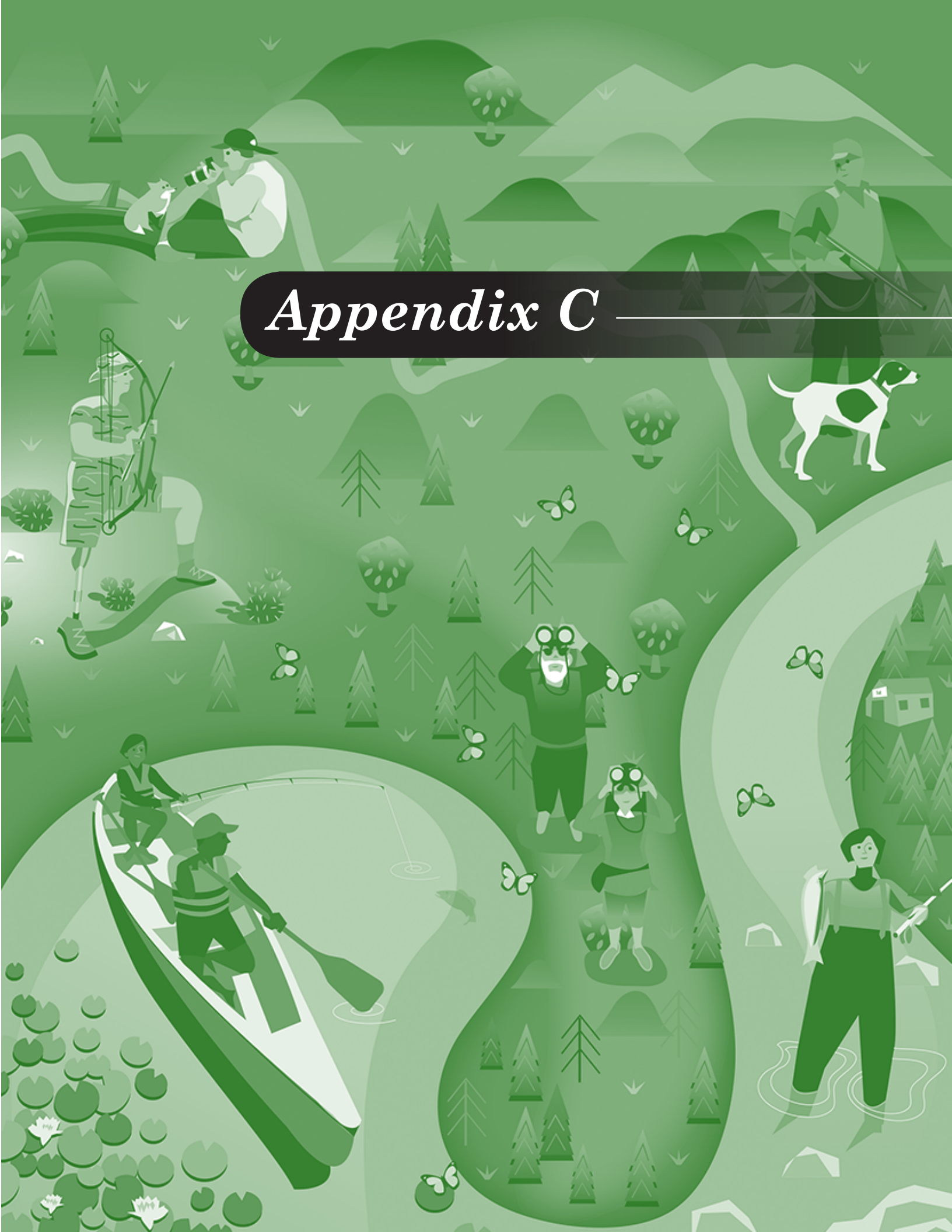
(Population 6 to 15 years old. Numbers in thousands)

Characteristic	Population		Total wildlife watchers			Away from Home			Around the home		
	Number	Percent	Number	Percent who participated	Percent	Number	Percent who participated	Percent	Number	Percent who participated	Percent
Total persons	**1,279**	**100**	**413**	**32**	**100**	***198**	***15**	***100**	**375**	**29**	**100**
Population Density of Residence											
Urban	1,048	82	*312	*30	*75	*159	*15	*80	*273	*26	*73
Rural	231	18	*102	*44	*25	...	...	...	*102	*44	*27
Population Size of Residence											
Metropolitan Statistical Area (MSA)	1,259	98	401	32	97	*198	*16	*100	*363	*29	*97
1,000,000 or more	532	42	*155	*29	*37	*125	*24	*63	*127	*24	*34
250,000 to 999,999	*360	*28	...	...	...	...	...	...	...	...	...
50,000 to 249,999	367	29	*77	*21	*19	...	...	...	...	...	...
Outside MSA	...	...	...	...	...	...	...	...	...	...	...
Age											
6 to 8 years	*261	*20	...	...	...	...	...	...	...	...	...
9 to 11 years	*287	*22	*122	*43	*30	...	...	...	*103	*36	*28
12 to 15 years	731	57	*212	*29	*51	...	...	...	*192	*26	*51
Sex											
Male	652	51	*231	*35	*56	*108	*17	*54	*198	*30	*53
Female	627	49	*182	*29	*44	...	...	...	*177	*28	*47
Ethnicity											
Hispanic	...	...	...	...	...	...	...	...	...	...	...
Non-Hispanic	1,198	94	413	35	100	*198	*17	*100	375	31	100
Race											
White	971	76	380	39	92	*169	*17	*85	*356	*37	*95
African American	*273	*21	...	...	...	...	...	...	...	...	...
All others	...	...	...	...	...	...	...	...	...	...	...
Annual Household Income											
Less than $20,000	*61	*5	...	...	...	...	...	...	...	...	...
$20,000 to $29,999	...	...	...	...	...	...	...	...	...	...	...
$30,000 to $39,999	*150	*12	...	...	...	...	...	...	...	...	...
$40,000 to $49,999	...	...	...	...	...	...	...	...	...	...	...
$50,000 to $74,999	*116	*9	*96	*83	*23	...	...	...	*96	*83	*26
$75,000 to $99,999	*388	*30	...	...	...	...	...	...	...	...	...
$100,000 or more	*204	*16	...	...	...	...	...	...	...	...	...
Not reported	*217	*17	...	...	...	...	...	...	...	...	...

* Estimate based on a sample size of 10–29. ... Sample size too small (less than 10) to report data reliably.

Note: Percent who participated columns show the percent of each row's population who participated in the activity named by the column (the percent of those living in urban areas who fished, etc.). Remaining percent columns show the percent of each column's participants who are described by the row heading (the percent of anglers who lived in urban areas, etc.). Data reported on this table are from screening interviews in which one adult household member responded for household members 6 to 15 years old. The screening interview required the respondent to recall 12 months worth of activity. Includes state residents who fished or hunted only in other countries.

Appendix C



Appendix C.
Significant Methodological Changes From Previous Surveys and Regional Trends

This appendix provides a description of data collection changes and national and regional trend information based on the 1991, 1996, 2001, 2006, and 2011 Surveys. Since these five surveys used similar methodologies, their published information is directly comparable.

Significant Methodological Differences

The most significant design differences in the five Surveys are as follows:

1. The 1991 Survey data was collected by interviewers filling out paper questionnaires. The data entries were keyed in a separate operation after the interview. The 1996, 2001, 2006, and 2011 Survey data were collected by the use of computer-assisted interviews. The questionnaires were programmed into computers, and the interviewer keyed in the responses at the time of the interview.

2. The 1991 Survey screening phase was conducted in January and February of 1991, when a household member of the sample households was interviewed on behalf of the entire household. The screening interviews for the 1996, 2001, and 2006 Surveys were conducted April through June of their survey years in conjunction with the first wave of the detailed interviews. The 2011 Survey also conducted screening interviews and the first detailed interviews April through June of 2011, but furthermore had an additional screening and detailed effort from February 2012 to the end of May 2012. The April–June 2011 screening effort had a high noncontact rate because of poor results using sample telephone numbers obtained from a private firm. Census went back to the noncontacted component of the original sample in February-May 2012 and interviewed a subsample, requiring annual recall for those respondents. The Wave 3 screen sample was 12,484 of the total 48,600 household screen sample. A modification of the 2011 sampling scheme was to oversample counties that had relatively high proportions of hunting license purchases.

The screening interviews for all five Surveys consisted primarily of demographic questions and wildlife-related recreation questions concerning activity in the previous year (1990, 1995, etc.) and intentions for recreating in the survey year.

In the 1991 Survey, an attempt was made to contact every sample person in all three detailed interview waves. In 1996, 2001, 2006, and 2011 respondents who were interviewed in the first detailed interview wave were not contacted again until the third wave (unless they were part of the other subsample, i.e., a respondent in both the sportsperson and wildlife watching subsamples could be in the first and third wave of sportsperson interviewing and the second and third wave of wildlife watching interviewing). Also, all interviews in the second wave were conducted only by telephone. In-person interviews were only conducted in the first and third waves. The 2011 wave 3 screen phase was composed of both telephone and in-person interviews.

Section I. Important Instrument Changes in the 1996 Survey

1. The 1991 Survey collected information on all wildlife-related recreation purchases made by participants without reference to where the purchase was made. The 1996 Survey asked in which state the purchase was made.

2. In 1991, respondents were asked what kind of fishing they did, i.e., Great Lakes, other freshwater, or saltwater, and then were asked in what states they fished. In 1996, respondents were asked in which states they fished and then were asked what kind of fishing they did. This method had the advantage of not asking about, for example, saltwater fishing when they only fished in a noncoastal state.

3. In 1991, respondents were asked how many days they "actually" hunted or fished for a particular type of game or fish and then how many days they "chiefly" hunted or fished for the same type of game or fish rather than another type of game or fish. To get total days of hunting or fishing for a particular type of game or fish, the "actually" day response was used, while to get the sum of all days of hunting or fishing, the "chiefly" days were summed. In 1996, respondents were asked their total days of hunting or fishing in the country and each state, then how many days they hunted or fished for a particular type of game or fish.

4. Trip-related and equipment expenditure categories were not the same for all Surveys. "Guide fee" and "Pack trip or package fee" were two separate trip-related expenditure items in 1991, while they were combined into one category in the 1996 Survey. "Boating costs" was added to the 1996 hunting and wildlife-watching trip-related expenditure sections. "Heating and cooking fuel" was added to all of the trip-related expenditure sections. "Spearfishing equipment"

was moved from a separate category to the "other" list. "Rods" and "Reels" were two separate categories in 1991 but were combined in 1996. "Lines, hooks, sinkers, etc." was one category in 1991 but split into "Lines" and "Hooks, sinkers, etc." in 1996. "Food used to feed other wildlife" was added to the wildlife-watching equipment section, "Boats" and "Cabins" were added to the wildlife-watching special equipment section, and "Land leasing and ownership" was added to the wildlife-watching expenditures section.

5. Questions asking sportspersons if they participated as much as they wanted were added in 1996. If the sportspersons said no, they were asked why not.

6. The 1991 Survey included questions about participation in organized fishing competitions; anglers using bows and arrows, nets or seines, or spearfishing; hunters using pistols or handguns and target shooting in preparation for hunting. These questions were not asked in 1996.

7. The 1996 Survey included questions about catch and release fishing and persons with disabilities participating in wildlife-related recreation. These questions were not part of the 1991 Survey.

8. The 1991 Survey included questions about average distance traveled to recreation sites. These questions were not included in the 1996 Survey.

9. The 1996 Survey included questions about the last trip the respondent took. Included were questions about the type of trip, where the activity took place, and the distance and direction to the site visited. These questions were not asked in 1991.

10. The 1991 Survey collected data on hunting, fishing, and wildlife watching by U.S. residents in Canada. The 1996 Survey collected data on fishing and wildlife-watching by U.S. residents in Canada.

Section II. Important Instrument Changes in the 2001 Survey

1. The 1991 and 1996 single race category "Asian or Pacific Islander" was changed to two categories "Asian" and "Native Hawaiian or Other Pacific Islander." In 1991 and 1996, the respondent was required to pick only one category, while in 2001 the respondent could pick any combination of categories. The next question stipulated that the respondent could only be identified with one category and then asked what that category was.

2. The 1991 and 1996 land leasing and ownership sections asked the respondent to combine the two types of land use into one and give total acreage and expenditures. In 2001, the two types of land use were explored separately.

3. The 1991 and 1996 wildlife-watching sections included questions on birdwatching for around-the-home participants only. The 2001 Survey added a question on birdwatching for away-from-home participants. Also, questions on the use of birding life lists and how many species the respondent can identify were added.

4. "Recreational vehicles" was added to the sportspersons and wildlife-watchers special equipment section. "House trailer" was added to the sportspersons special equipment section.

5. Total personal income was asked in the detailed phase of the 1996 Survey. This was changed to total household income in the 2001 Survey.

6. A question was added to the trip-related expenditures section to ascertain how much of the total was spent in the respondent's state of residence when the respondent participated in hunting, fishing, or wildlife watching out-of-state.

7. Boating questions were added to the fishing section. The respondent was asked about the extent of boat usage for the three types of fishing.

8. The 1996 Survey included questions about the months around-the-home wildlife watchers fed birds. These questions were not repeated in the 2001 Survey.

9. The contingent valuation sections of the three types of wildlife-related recreation were altered, using an open-ended question format instead of 1996's dichotomous choice format.

Section III. Important Instrument Changes in the 2006 Survey

1. A series of boating questions was added. The new questions dealt with anglers using motorboats and/or nonmotorboats, length of boat used most often, distance to boat launch used most often, needed improvements to facilities at the launch, whether or not the respondent completed a boating safety course, who the boater fished with most often, and the source and type of information the boater used for his or her fishing.

2. Questions regarding catch and release fishing were added. They were whether or not the respondent caught and released fish and, if so, the percent of fish released.

3. The proportion of hunting done with a rifle or shotgun, as contrasted with muzzleloader or archery equipment, was asked.

4. In the contingent valuation section, where the value of wildlife-related recreation was determined, two quality-variable questions were added: the average length of certain fish caught and whether a deer, elk, or moose was killed. Plus the economic evaluation bid questions were rephrased, from "What is the most your [species] hunting in [State name] could have cost you per trip last year before you would NOT have gone [species] hunting at all in 2001, not even one trip, because it would have been too expensive?", for the hunters, for example, to "What is the cost that would have prevented you from taking even one such trip in 2006? In other words, if the trip cost was below this amount, you would have gone [species] hunting in [State name], but if the trip cost was above this amount, you would not have gone."

5. Questions concerning hunting, fishing, or wildlife watching in other countries were taken out of the Survey.

6. Questions about the reasons for not going hunting or fishing, or not going as much as expected, were deleted.

7. Disability of participants questions were taken out.

8. Determination of the types of sites for wildlife watching was discontinued.

9. The birding questions regarding the use of birding life lists and the ability to identify birds based on their sight or sounds were deleted.

10. Public transportation costs were divided into two sections, "public transportation by airplane" and "other public transportation, including trains, buses, and car rentals, etc.".

Section IV. Important Instrument Changes in the 2011 Survey

1. The series of boating questions added in 2006 was deleted.

2. Questions about target shooting and the usage of a shooting range in preparation for hunting were added. The types of weapon used at the shooting range were quantified.

3. Questions about plantings expenditures for the purpose of hunting were added.

4. "Feral pig" was recategorized from big game to other animals for all states except Hawaii.

5. "Ptarmigan" was included as its own small game category, instead of lumped in "other."

6. In previous Surveys, "Moose" was included as its own category only for Alaska. For 2011, "Moose" was included as its own big game category, instead of lumped in "other," for all fifty states.

7. In previous Surveys, "Wolf" was included as its own category only for Alaska. For 2011, "Wolf" was included as its own other animal category, instead of lumped in "other," for all fifty states.

8. The household income categories were modified. The top categories were changed from "$100,000 or more" to "$100,000 to $149,999" and "$150,000 or more."

9. The "Steelhead" category was deleted from the saltwater fish species section, with the idea that it would be included in "other."

10. The 2006 around-the-home wildlife-watching category that quantified visitors of "public parks or areas" was rewritten to wildlife watching at "parks or natural areas." This change was to make clear that respondents should include recreating at quasi-governmental and private areas.

11. The 2006 wildlife watching equipment category "Film and developing" was rewritten to "Film and photo processing."

Regional Trends

This trends section covers the period from 1991 to 2011. The 1991, 1996, 2001, 2006, and 2011 Surveys used similar methodologies, making all published information for the five Surveys directly comparable.

Table C-1a. Comparison of Wildlife-Related Recreation in the United States: 1991–1996

(U.S. population 16 years old and older. Numbers in thousands. All expenditures in 2011 dollars. 1996 expenditures categories made comparable to 1991)

Participants, days, and expenditures	1991 (number)	1996 (number)	1991–1996 percent change
Hunting			
Hunters, total	14,063	13,975	[NS]–1
Hunting days, total	235,806	256,676	[NS]9
Hunting expenditures, total	$20,399,152	$29,259,999	43
Fishing			
Anglers, total	35,578	35,246	[NS]–1
Fishing days, total	511,329	625,893	22
Fishing expenditures, total	$39,669,337	$54,224,581	37
Wildlife Watching			
Wildlife watchers, total	76,111	62,868	–17
Around the home	73,904	60,751	–18
Away from home	29,999	23,652	–21
Wildlife-watching days, away from home	342,406	313,790	[NS]–8
Wildlife-watching expenditures, total	$30,574,499	$36,924,875	21

[NS] Not different from zero at the 5 percent level of significance.

Table C-1b. Comparison of Wildlife-Related Recreation in the United States: 1996–2001

(U.S. population 16 years old and older. Numbers in thousands. All expenditures in 2011 dollars. 1996 and 2001 expenditures categories made comparable to 1991)

Participants, days, and expenditures	1996 (number)	2001 (number)	1996–2001 percent change
Hunting			
Hunters, total	13,975	13,034	–7
Hunting days, total	256,676	228,368	–11
Hunting expenditures, total	$29,259,999	$25,993,960	[NS]–11
Fishing			
Anglers, total	35,246	34,071	–3
Fishing days, total	625,893	557,394	–11
Fishing expenditures, total	$54,224,581	$45,076,739	–17
Wildlife Watching			
Wildlife watchers, total	62,868	66,105	5
Around the home	60,751	62,928	4
Away from home	23,652	21,823	–8
Wildlife-watching days, away from home	313,790	372,006	19
Wildlife-watching expenditures, total	$36,924,875	$42,904,872	16

[NS] Not different from zero at the 5 percent level of significance.

Table C-1c. Comparison of Wildlife-Related Recreation in the United States: 2001–2006

(U.S. population 16 years old and older. Numbers in thousands. All expenditures in 2011 dollars. 2001 and 2006 expenditures categories made comparable to 1991)

Participants, days, and expenditures	2001 (number)	2006 (number)	2001–2006 percent change
Hunting			
Hunters, total	13,034	12,510	[NS]–4
Hunting days, total	228,368	219,925	[NS]–4
Hunting expenditures, total	$25,993,960	$25,265,523	[NS]–3
Fishing			
Anglers, total	34,071	29,952	–12
Fishing days, total	557,394	516,781	–7
Fishing expenditures, total	$45,076,739	$46,909,364	[NS]4
Wildlife Watching			
Wildlife watchers, total	66,105	71,132	8
Around the home	62,928	67,756	8
Away from home	21,823	22,977	[NS]5
Wildlife-watching days, away from home	372,006	352,070	[NS]–5
Wildlife-watching expenditures, total	$42,904,872	$40,023,078	[NS]–7

[NS] Not different from zero at the 5 percent level of significance.

Table C-1d. Comparison of Wildlife-Related Recreation in the United States: 2006–2011

(U.S. population 16 years old and older. Numbers in thousands. All expenditures in 2011 dollars. 2006 and 2011 expenditures categories made comparable to 1991)

Participants, days, and expenditures	2006 (number)	2011 (number)	2006–2011 percent change
Hunting			
Hunters, total	12,510	13,674	9
Hunting days, total	219,925	281,884	28
Hunting expenditures, total	$25,265,523	$32,579,640	29
Fishing			
Anglers, total	29,952	33,112	11
Fishing days, total	516,781	553,841	[NS]7
Fishing expenditures, total	$46,909,364	$41,624,599	[NS]–11
Wildlife Watching			
Wildlife watchers, total	71,132	71,776	[NS]1
Around the home	67,756	68,598	[NS]1
Away from home	22,977	22,496	[NS]–2
Wildlife-watching days, away from home	352,070	335,625	[NS]–5
Wildlife-watching expenditures, total	$40,023,078	$43,636,608	[NS]9

[NS] Not different from zero at the 5 percent level of significance.

Table C-1e. Comparison of Wildlife-Related Recreation in the United States: 1991–2011

(U.S. population 16 years old and older. Numbers in thousands. All expenditures in 2011 dollars. 2011 expenditures categories made comparable to 1991)

Participants, days, and expenditures	1991 (number)	2011 (number)	1991–2011 percent change
Hunting			
Hunters, total	14,063	13,674	[NS]–3
Hunting days, total	235,806	281,884	20
Hunting expenditures, total	$20,399,152	$32,579,640	60
Fishing			
Anglers, total	35,578	33,112	–7
Fishing days, total	511,329	553,841	8
Fishing expenditures, total	$39,669,337	$41,624,599	[NS]5
Wildlife Watching			
Wildlife watchers, total	76,111	71,776	–6
Around the home	73,904	68,598	–7
Away from home	29,999	22,496	–25
Wildlife-watching days, away from home	342,406	335,625	[NS]–2
Wildlife-watching expenditures, total	$30,574,499	$43,636,608	43

[NS] Not different from zero at the 5 percent level of significance.

Table C-2. Anglers and Hunters by Census Division: 1991, 1996, 2001, 2006, and 2011

(U.S. population 16 years old and older. Numbers in thousands)

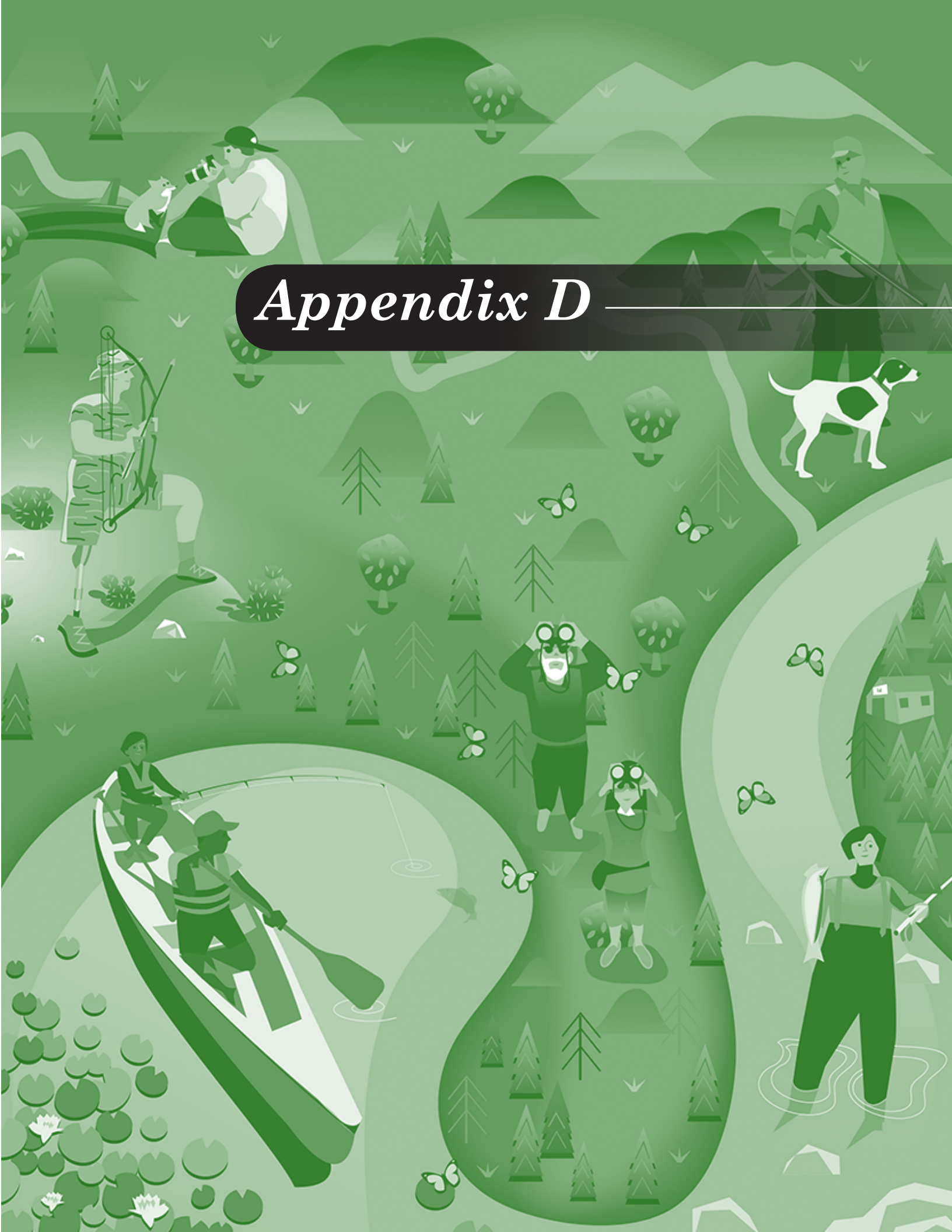
Area and sportsperson	1991		1996		2001		2006		2011	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
UNITED STATES										
Total population	189,964	100	201,472	100	212,298	100	229,245	100	239,313	100
Sportspersons	39,979	21	39,694	20	37,805	18	33,916	15	37,397	16
Anglers	35,578	19	35,246	17	34,067	16	29,952	13	33,112	14
Hunters	14,063	7	13,975	7	13,034	6	12,510	5	13,674	6
New England										
Total population	10,180	100	10,306	100	10,575	100	11,233	100	11,593	100
Sportspersons	1,658	16	1,673	16	1,504	14	1,353	12	1,441	12
Anglers	1,545	15	1,520	15	1,402	13	1,246	11	1,355	12
Hunters	444	4	465	5	386	4	374	3	420	4
Middle Atlantic										
Total population	29,216	100	29,371	100	29,806	100	31,518	100	32,392	100
Sportspersons	4,508	15	4,192	14	3,810	13	3,214	10	3,966	12
Anglers	3,871	13	3,627	12	3,250	11	2,550	8	3,496	11
Hunters	1,746	6	1,453	5	1,633	5	1,520	5	1,558	5
East North Central										
Total population	32,188	100	33,121	100	34,082	100	35,609	100	36,199	100
Sportspersons	7,202	22	6,912	21	6,400	19	5,975	17	6,766	19
Anglers	6,264	19	6,006	18	5,655	17	5,190	15	5,861	16
Hunters	2,789	9	2,712	8	2,421	7	2,376	7	2,688	7
West North Central										
Total population	13,504	100	13,875	100	14,430	100	15,458	100	15,860	100
Sportspersons	4,143	31	3,977	29	4,239	29	3,836	25	3,980	25
Anglers	3,647	27	3,416	25	3,836	27	3,284	21	3,591	23
Hunters	1,709	13	1,917	14	1,710	12	1,779	12	1,661	10
South Atlantic										
Total population	33,682	100	36,776	100	39,286	100	43,965	100	46,417	100
Sportspersons	6,996	21	7,282	20	6,957	18	6,633	15	6,749	15
Anglers	6,441	19	6,636	18	6,451	16	6,116	14	6,163	13
Hunters	2,083	6	2,050	6	1,875	5	1,884	4	1,870	4
East South Central										
Total population	11,667	100	12,459	100	12,976	100	13,722	100	14,206	100
Sportspersons	2,984	26	2,907	23	2,865	22	2,689	20	3,010	21
Anglers	2,635	23	2,514	20	2,543	20	2,436	18	2,444	17
Hunters	1,279	11	1,301	10	1,164	9	1,101	8	1,531	11
West South Central										
Total population	19,926	100	21,811	100	23,337	100	25,407	100	27,195	100
Sportspersons	5,125	26	5,093	23	4,924	21	4,499	18	4,855	18
Anglers	4,592	23	4,616	21	4,375	19	3,952	16	4,298	16
Hunters	1,843	9	1,812	8	1,988	9	1,810	7	1,909	7
Mountain										
Total population	10,092	100	11,966	100	13,308	100	15,651	100	17,013	100
Sportspersons	2,488	25	2,761	23	2,757	21	2,372	15	2,976	17
Anglers	2,079	21	2,411	20	2,443	18	2,084	13	2,586	15
Hunters	1,069	11	1,061	9	1,020	8	868	6	1,043	6
Pacific										
Total population	29,508	100	31,787	100	34,498	100	36,681	100	38,438	100
Sportspersons	4,875	17	4,897	15	4,349	13	3,345	9	3,654	10
Anglers	4,505	15	4,501	14	4,111	12	3,094	8	3,319	9
Hunters	1,101	4	1,203	4	837	2	798	2	996	3

Table C-3. Wildlife-Watching Participants by Census Division: 1991, 1996, 2001, 2006, and 2011

(U.S. population 16 years old and older. Numbers in thousands)

Area and wildlife watcher	1991		1996		2001		2006		2011	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
UNITED STATES										
Total population	189,964	100	201,472	100	212,298	100	229,245	100	239,313	100
Total wildlife watchers	76,111	40	62,868	31	66,105	31	71,132	31	71,776	30
Away from home	29,999	16	23,652	12	21,823	10	22,977	10	22,496	9
Around the home	73,904	39	60,751	30	62,928	30	67,756	30	68,598	29
New England										
Total population	10,180	100	10,306	100	10,575	100	11,233	100	11,593	100
Total wildlife watchers	4,598	45	3,710	36	3,875	37	4,489	40	3,954	34
Away from home	1,856	18	1,443	14	1,155	11	1,340	12	1,187	10
Around the home	4,544	45	3,586	35	3,765	36	4,310	38	3,858	33
Middle Atlantic										
Total population	29,216	100	29,371	100	29,806	100	31,518	100	32,392	100
Total wildlife watchers	10,556	36	8,185	28	8,740	29	8,723	28	9,118	28
Away from home	4,166	14	2,960	10	2,849	10	2,729	9	2,561	8
Around the home	10,282	35	8,023	27	8,452	28	8,451	27	8,744	27
East North Central										
Total population	32,188	100	33,121	100	34,082	100	35,609	100	36,199	100
Total wildlife watchers	14,511	45	11,731	35	11,631	34	12,215	34	12,840	35
Away from home	5,572	17	4,501	14	3,571	10	3,792	11	3,168	9
Around the home	14,175	44	11,297	34	11,196	33	11,845	33	12,492	35
West North Central										
Total population	13,504	100	13,875	100	14,430	100	15,458	100	15,860	100
Total wildlife watchers	6,924	51	5,089	37	6,206	43	6,741	44	5,479	35
Away from home	2,654	20	1,927	14	2,059	14	2,163	14	1,783	11
Around the home	6,722	50	4,900	35	5,938	41	6,447	42	5,201	33
South Atlantic										
Total population	33,682	100	36,776	100	39,286	100	43,965	100	46,417	100
Total wildlife watchers	13,047	39	11,252	31	11,395	29	12,862	29	13,315	29
Away from home	4,450	13	3,992	11	3,469	9	3,208	7	4,393	9
Around the home	12,813	38	10,964	30	10,911	28	12,432	28	12,767	28
East South Central										
Total population	11,667	100	12,459	100	12,976	100	13,722	100	14,206	100
Total wildlife watchers	4,864	42	3,904	31	4,514	35	4,931	36	4,663	33
Away from home	1,592	14	1,118	9	1,086	8	1,758	13	1,456	10
Around the home	4,765	41	3,795	30	4,390	34	4,683	34	4,394	31
West South Central										
Total population	19,926	100	21,811	100	23,337	100	25,407	100	27,195	100
Total wildlife watchers	7,035	35	5,933	27	5,747	25	6,764	27	7,164	26
Away from home	2,459	12	2,096	10	1,822	8	2,127	8	1,728	6
Around the home	6,817	34	5,773	26	5,490	24	6,319	25	7,087	26
Mountain										
Total population	10,092	100	11,966	100	13,308	100	15,651	100	17,013	100
Total wildlife watchers	4,437	44	4,099	34	4,619	35	4,968	32	5,189	30
Away from home	2,215	22	1,967	16	2,019	15	2,004	13	2,230	13
Around the home	4,145	41	3,855	32	4,282	32	4,605	29	4,716	28
Pacific										
Total population	29,508	100	31,787	100	34,498	100	36,681	100	38,438	100
Total wildlife watchers	10,139	34	8,966	28	9,377	27	9,439	26	10,054	26
Away from home	5,035	17	3,648	11	3,793	11	3,856	11	3,990	10
Around the home	9,641	33	8,558	27	8,504	25	8,664	24	9,337	24

Appendix D



Appendix D.
Sample Design and Statistical Accuracy

This appendix is presented in two parts. The first part is the U.S. Census Bureau Source and Accuracy Statement. This statement describes the sampling design for the 2011 Survey and highlights the steps taken to produce estimates from the completed questionnaires. The statement explains the use of standard errors and confidence intervals. It also provides comprehensive information about errors characteristic of surveys and formulas and parameters to calculate an approximate standard error or confidence interval for each number published in this report. The second part, Tables D-1 through D-9, reports estimates and approximate standard errors for selected measures of participation and expenditures for wildlife-related recreation.

Source and Accuracy Statement for the Michigan State Report of the *2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*

SOURCE OF DATA

The estimates in this report are based on data collected in the *2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation* (FHWAR) conducted by the Census Bureau and sponsored by the U.S. Fish and Wildlife Service.

The eligible universe for the FHWAR is the civilian noninstitutionalized and nonbarrack military population living in the United States. The institutionalized population, which is excluded from the population universe, is composed primarily of the population in correctional institutions and nursing homes (98 percent of the 4 million institutionalized people in Census 2010).

The 2011 FHWAR was designed to provide state-level estimates of the number of participants in recreational hunting and fishing and in wildlife watching activities (e.g., wildlife observation). Information was collected on the number of participants, where and how often they participated, the type of wildlife encountered, and the amounts of money spent on wildlife-related recreation.

The survey was conducted in two stages: an initial screening of households to identify likely sportspersons and wildlife-watching participants and a series of follow-up interviews of selected persons to collect detailed data about their wildlife-related recreation during 2011.

SAMPLE DESIGN

The 2011 FHWAR sample was selected from the Census Bureau's master address file (MAF).

The FHWAR is a multistage probability sample, with coverage in all 50 states and the District of Columbia.[1] In the first stage of the sampling process, primary sampling units (PSUs) are selected for sample. The PSUs are defined to correspond to the Office of Management and Budget definitions of Core Based Statistical Area definitions and to improve efficiency in field operations. The United States is divided into 2,025 PSUs. These PSUs are grouped into 824 strata. Within each stratum, a single PSU is chosen for the sample, with its probability of selection proportional to its population as of the 2000 decennial census. This PSU represents the entire stratum from which it was selected. In the case of strata consisting of only one PSU, the PSU is chosen with certainty.

Within the selected PSUs, the FHWAR sample was selected from the MAF.

FHWAR Screening Sample

The total screening sample in Michigan consisted of **577** households. Interviewing for the screen was conducted during April, May, and June 2011. Due to a high noncontact rate, an additional personal visit screening interview, for a subsample of noncontact cases, occurred again in February, March, April, or May 2012. Of all housing units in sample, about **497** were determined to be eligible for interview. Interviewers obtained interviews at **368** of these units for a Michigan response rate of **74** percent.[2] Michigan's weighted response rate was **74** percent. The interviewers asked screening questions for all household members 6 years old and older. Noninterviews occur when the occupants are not found at home after repeated calls or are unavailable for some other reason.

Data for the FHWAR sportspersons sample and wildlife-watchers sample were collected in three waves.[3] The first wave started in April 2011, the second in September 2011, and the third in January 2012. In the sportspersons sample, all persons who hunted or fished in 2011 by the time of the screening interview were interviewed in the first wave. The remaining sportspersons in sample were interviewed in the second wave. The reference period was the preceding 4 months for waves 1 and 2. In wave 3, the reference period was either 4, 8, or 12 months depending on when the sample person was first interviewed.

[1] The sample size in the District of Columbia (D.C.) is not of sufficient size to produce reliable estimates for only D.C. The sample responses from D.C. are included in the U.S. totals for complete coverage of the U.S. (excluding Puerto Rico and the U.S. Virgin Islands).

[2] Response rates are calculated by using APPOR's RR2 formula.

[3] The sample cases selected due to high noncontact rates were only interviewed once. They received a screener and if they had some form of participation a detailed questionnaire. These participants did not get three waves of interviewing. The reference period for these sampled cases was between 13 and 16 months.

Detailed Samples

Two independent detailed samples were chosen from the FHWAR screening sample. One consisted of sportspersons (people who hunt or fish) and the other of wildlife watchers (people who observe, photograph, or feed wildlife).

A. Sportspersons

The Census Bureau selected the detailed samples based on information reported during the screening phase. Based on information collected from the household respondent, every person 16 years old and older in the FHWAR screening sample was assigned to a sportspersons stratum. The criteria for the strata included time devoted to hunting or fishing in previous years, participation in hunting or fishing in 2011 by the time of the screening interview, and intentions to participate in hunting and fishing activities during the remainder of 2011.[4] The four sportspersons categories were:

1. *Active*—a person who had already participated in hunting or fishing in 2011 at the time of the screener interview.
2. *Likely*—a person who had not participated in 2011 at the time of the screener, but had participated in 2010 OR was likely to participate in 2011.
3. *Inactive*—a person who had not participated in 2010 or 2011 AND was somewhat unlikely to participate in 2011.
4. *Nonparticipant*—a person who had not participated in 2010 or 2011 AND was very unlikely to participate in 2011.

Due to the high noncontact rates in wave 1, all persons in the active, likely, and inactive groups were selected with certainty.

Active sportspersons were given the detailed interview twice—at the time of the screening interview (in April, May, or June 2011) and again in January or February 2012.[5] Likely sportspersons and inactive sportspersons were also interviewed twice—first in September or October 2011, then in January or February 2012. Persons in the nonparticipant group were not eligible for a detailed interview. About **233** persons were designated for interviews in Michigan. The detailed sportspersons sample sizes varied by state to get reliable state-level estimates. During each interview period, about **20** percent of the designated persons were not found at home or were unavailable for some other reason. Overall, about **187** detailed sportspersons interviews were completed at a response rate of **80** percent.

B. Wildlife Watchers

The wildlife-watching detailed sample was also selected based on information reported during the screening phase. Based on information collected from the household respondent, every person 16 years old and older was assigned to a stratum. The criteria for the strata included time devoted to wildlife watching activities in previous years, participation in wildlife watching activities in 2011 by the time of the screening interview, and intentions to participate in wildlife watching activities during the remainder of 2011.[6] The five wildlife-watching categories were:

1. *Active*—a person who had already participated in 2011 at the time of the screening interview.
2. *Avid*—a person who had not yet participated in 2011, but in 2010 had taken trips to participate in wildlife-watching activities for 21 or more days or had spent $300 or more.
3. *Average*—a person who had not yet participated in 2011, but in 2010 had taken trips to wildlife watch for less than 21 days and had spent less than $300 OR had not participated in wildlife-watching activities but was very likely to in the remainder of 2011.
4. *Infrequent*—a person who had not participated in 2010 or 2011, but was somewhat likely or somewhat unlikely to participate in the remainder of 2011.
5. *Nonparticipant*—a person who had not participated in 2010 or 2011 AND was very unlikely to participate during the remainder of 2011.

Persons were selected for the detailed sample based on these groupings, but persons in the nonparticipant group were not eligible for a detailed interview.

A subsample of each of the other groups was selected to receive a detailed interview with the chance of selection diminishing as the likelihood of participation diminished. Wildlife-watching participants were given the detailed interview twice.[7] Some received their first detailed interview at the same time as the screening interview (in April, May, or June 2011). The rest received their first detailed interview in September or October 2011. All wildlife-watching participants received their second interview in January or February 2012. Some respondents were given the screener and detailed interview in February, March, April, or May 2012. About **187** persons were designated for interviews in Michigan. The detailed wildlife-watching sample sizes varied by state to get reliable state-level estimates. During each interview period, about **19** percent of the designated persons were not found at home or were unavailable for some other reason. Overall, about **151** detailed wildlife watcher interviews were completed at a response rate of **81** percent.

ESTIMATION PROCEDURE

Several stages of adjustments were used to derive the final 2011 FHWAR person weights. A brief description of the major components of the weights is given below. All statistics for the population 6 to 15 years of age were derived from the screening interview. Statistics for the population 16 years old and older come from both the screening and detailed interviews. Estimates that come from the screening sample are presented in Appendix B.

[4] The sample cases selected due to high noncontact rates were not assigned a sportsperson stratum.

[5] The sample cases selected due to high noncontact rates were given the detailed sportsperson interview once.

[6] The sample cases selected due to high noncontact rates were not assigned a wildlife watcher stratum. Wildlife-watching participants in these cases were then subsampled into the detailed questionnaire.

[7] The sample cases selected due to high noncontact rates were given the detailed wildlife-watching interview once.

A. Screening Sample

Every interviewed person in the screening sample received a screening weight that was the product of the following factors:

1. *Base Weight*. The base weight is the inverse of the household's probability of selection.
2. *Household Noninterview Adjustment*. The noninterview adjustment inflates the weight assigned to interviewed households to account for households eligible for interview but for which no interview was obtained.
3. *First-Stage Adjustment*. The 824 areas designated for our samples were selected from 2,025 such areas of the United States. Some sample areas represent only themselves and are referred to as self-representing. The remaining areas represent other areas similar in selected characteristics and are thus designated non-self-representing. The first-stage factor reduces the component of variation arising from sampling the non-self-representing areas.
4. *Second-Stage Adjustment*. This adjustment brings the estimates of the total population into agreement with census-based estimates of the civilian noninstitutionalized and nonbarrack military populations for each state.

B. Sportspersons Sample

Every interviewed person in the sportspersons detailed sample received a weight that was the product of the following factors:

1. *Screening Weight*. This is the person's final weight from the screening sample.
2. *Sportspersons Stratum Adjustment*. This factor inflates the weights of persons selected for the detailed sample to account for the subsampling done within each sportsperson stratum.
3. *Sportspersons Noninterview Adjustment*. This factor adjusts the weights of the interviewed sportspersons to account for sportspersons selected for the detailed sample for whom no interview was obtained. A person was considered a noninterview if he or she was not interviewed in the third wave of interviewing.
4. *Sportspersons Ratio Adjustment Factor*. This is a ratio adjustment of the detailed sample to the screening sample within the sportspersons sampling strata. This adjustment brings the population estimates of persons aged 16 years old and older from the detailed sample into agreement with the same estimates from the screening sample, which was a much larger sample.

C. Wildlife-Watchers Sample

Every interviewed person in the wildlife-watchers detailed sample received a weight that was the product of the following factors:

1. *Screening Weight*. This is the person's final weight from the screening sample.
2. *Wildlife-Watchers Stratum Adjustment*. This factor inflates the weights of persons selected for the detailed sample to account for the subsampling done within each wildlife watcher stratum.
3. *Wildlife-Watchers Noninterview Adjustment*. This factor adjusts the weights of the interviewed wildlife-watching participants to account for wildlife watchers selected for the detailed sample for whom no interview was obtained. A person was considered a noninterview if he or she was not interviewed in the third wave of interviewing.
4. *Wildlife-Watchers Ratio Adjustment Factor*. This is a ratio adjustment of the detailed sample to the screening sample within the wildlife-watchers sampling strata. This adjustment brings the population estimates of persons aged 16 years old and older from the detailed sample into agreement with the same estimates from the screening sample, which was a much larger sample.

ACCURACY OF THE ESTIMATES

A sample survey estimate has two types of error: sampling and nonsampling. The accuracy of an estimate depends on both types of error. The nature of the sampling error is known given the survey design; the full extent of the nonsampling error is unknown.

NONSAMPLING ERROR

For a given estimator, the difference between the estimate that would result if the sample were to include the entire population and the true population value being estimated is known as nonsampling error. There are several sources of nonsampling error that may occur during the development or execution of the survey. It can occur because of circumstances created by the interviewer, the respondent, the survey instrument, or the way the data are collected and processed. For example, errors could occur because:

- The interviewer records the wrong answer, the respondent provides incorrect information, the respondent estimates the requested information, or an unclear survey question is misunderstood by the respondent (measurement error).
- Some individuals who should have been included in the survey frame were missed (coverage error).
- Responses are not collected from all those in the sample or the respondent is unwilling to provide information (nonresponse error).
- Values are estimated imprecisely for missing data (imputation error).
- Forms may be lost; data may be incorrectly keyed, coded, or recoded, etc. (processing error).

The Census Bureau employs quality control procedures throughout the production process, including the overall design of surveys, the wording of questions, and the review of the work of interviewers and coders to minimize these errors. Two types of nonsampling error that can be exam-

ined to a limited extent are nonresponse and undercoverage.

Nonresponse. The effect of nonresponse cannot be measured directly, but one indication of its potential effect is the nonresponse rate. For the FHWAR screener interview in Michigan, the household-level nonresponse rate was **26** percent. The person-level nonresponse rate for the detailed sportsperson interview in Michigan was an additional **20** percent and for the wildlife watchers it was **19** percent. Since the screener nonresponse rate is a household-level rate and the detailed interview nonresponse rate is a person-level rate, we cannot combine these rates to derive an overall nonresponse rate. Since it is unlikely the nonresponding households to the FHWAR have the same number of persons as the households successfully interviewed, combining these rates would result in an overestimate of the "true" person-level overall nonresponse rate for the detailed interviews.

Coverage. Overall screener undercoverage is estimated to be about 13 percent. Ratio estimation to independent population controls, as described previously, partially corrects for the bias due to survey undercoverage. However, biases exist in the estimates to the extent that missed persons in missed households or missed persons in interviewed households have different characteristics from those of interviewed persons in the same age group.

Comparability of Data. Data obtained from the 2011 FHWAR and other sources are not entirely comparable. This results from differences in interviewer training and experience and in differing survey processes. This is an example of nonsampling variability not reflected in the standard errors. Therefore, caution should be used when comparing results from different sources. (See Appendix C.)

A Nonsampling Error Warning. Since the full extent of the nonsampling error is unknown, one should be particularly careful when interpreting results based on small differences between estimates. The Census Bureau recommends that data users incorporate information about nonsampling errors into their analyses, as nonsampling error could impact the conclusions drawn from the results. Caution should also be used when interpreting results based on a relatively small number of cases. Summary measures (such as medians and percentage distributions) probably do not reveal useful information when computed on a subpopulation smaller than 90,000 for screener data, 100,000 for the detailed sportsperson data, and 235,000 for the wildlife-watchers data.

SAMPLING ERROR

Since the FHWAR estimates come from a sample, they may differ from figures from an enumeration of the entire population using the same questionnaires, instructions, and enumerators. For a given estimator, the difference between an estimate based on a sample and the estimate that would result if the sample were to include the entire population is known as sampling error. Standard errors, as calculated by methods described in "Standard Errors and Their Use," are primarily measures of the magnitude of sampling error. However, they may include some nonsampling error.

Standard Errors and Their Use. The sample estimate and its standard error enable one to construct a confidence interval. A confidence interval is a range that has a known probability of including the average result of all possible samples. For example, if all possible samples were surveyed under essentially the same general conditions and using the same sample design, and if an estimate and its standard error were calculated from each sample, then approximately 95 percent of the intervals from 1.96 standard errors below the estimate to 1.96 standard errors above the estimate would include the average result of all possible samples. A particular confidence interval may or may not contain the average estimate derived from all possible samples. However, one can say with specified confidence that the interval includes the average estimate calculated from all possible samples. Standard errors may also be used to perform hypothesis testing, a procedure for distinguishing between population parameters using sample estimates. The most common type of hypothesis is that the population parameters are different. An example would be comparing the proportion of anglers to the proportion of hunters. Tests may be performed at various levels of significance. A significance level is the probability of concluding that the characteristics are different when, in fact, they are the same. For example, to conclude that two characteristics are different at the 0.05 level of significance, the absolute value of the estimated difference between characteristics must be greater than or equal to 1.96 times the standard error of the difference. This report uses 95-percent confidence intervals and 0.05 level of significance to determine statistical validity. Consult standard statistical textbooks for alternative criteria.

Estimating Standard Errors. The Census Bureau uses replication methods to estimate the standard errors of FHWAR estimates. These methods primarily measure the magnitude of sampling error. However, they do measure some effects of nonsampling error as well. They do not measure systematic biases in the data associated with nonsampling error. Bias is the average over all possible samples of the differences between the sample estimates and the true value.

Generalized Variance Parameters. While it is possible to compute and present an estimate of the standard error based on the survey data for each estimate in a report, there are a number of reasons why this is not done. A presentation of the individual standard errors would be of limited use, since one could not possibly predict all of the combinations of results that may be of interest to data users. Additionally, data users have access to FHWAR microdata files, and it is impossible to compute in advance the standard error for every estimate one might obtain from those data sets. Moreover, variance estimates are based on sample data and have variances of their own. Therefore, some methods of stabilizing these estimates of variance, for example, by generalizing or averaging over time, may be used to improve their reliability. Experience has shown that certain groups of estimates have similar relationships between their variances and expected values. Modeling or generalizing may provide more stable variance estimates by taking advantage of these similarities. The generalized variance function is a simple model that expresses the variance as a function of the expected value of the survey estimate. The parameters of the

generalized variance function are estimated using direct replicate variances. These generalized variance parameters provide a relatively easy method to obtain approximate standard errors for numerous characteristics. Table D-2 provide the generalized variance parameters for FHWAR data. Methods for using the parameters to calculate standard errors of various estimates are given in the next sections.

Standard Errors of Estimated Numbers. The approximate standard error, s_x, of an estimated number shown in this report can be obtained using the following formulas. Formula (1) is used to calculate the standard errors of levels of sportspersons, anglers, and wildlife watchers.

$$s_x = \sqrt{ax^2 + bx} \tag{1}$$

Here, x is the size of the estimate and a and b are the parameters in the tables associated with the particular characteristic.

Formula (2) is used for standard errors of aggregates, i.e., trips, days, and expenditures.

$$s_x = \sqrt{ax^2 + bx + \frac{cx^2}{y}} \tag{2}$$

Here, x is again the size of the estimate; y is the base of the estimate; and a, b, and c are the parameters in the tables associated with the particular characteristic.

Illustration of the Computation of the Standard Error of an Estimated Number

Suppose there were an estimated 37,397,000 persons age 16 years old and older who either fished or hunted in the United States in 2011. Using formula (1) with the parameters $a = -0.000070$ and $b = 16{,}823$ from table D-2, the approximate standard error of the estimated number of 37,397,000 sportspersons age 16 years old and older is

$$s_x = \sqrt{-0.000070 * 37{,}397{,}000^2 + 16{,}823 * 37{,}397{,}000} = 728{,}857$$

The 95-percent confidence interval for the estimated number of sportspersons 16 years old and older is from 35,968,000 to 38,826,000, i.e., 37,397,000 ± 1.96 x 728,857. Therefore, a conclusion that the average estimate derived from all possible samples lies within a range computed in this way would be correct for roughly 95 percent of all possible samples.

Suppose there were an estimated 13,674,000 hunters age 16 years old and older who engaged in 281,884,000 days of participation in 2011. Using formula (2) with the parameters a = –0.000284, b = –127,863, and c = 46,699 from table D-2, the approximate standard error on 281,884,000 estimated days on an estimated base of 13,674,000 hunters is

$$s_x = \sqrt{-0.000284 * 281{,}884{,}000^2 - 127{,}863 * 281{,}884{,}000 + \frac{46{,}699 * 281{,}884{,}000^2}{13{,}674{,}000}} = 14{,}586{,}000$$

The 95-percent confidence interval on the estimate of 281,884,000 days is from 253,295,000 to 310,473,000, i.e., 281,884,000 ± 1.96 x 14,586,000. Again, a conclusion that the average estimate derived from all possible samples lies within a range computed in this way would be correct for roughly 95 percent of all possible samples.

Standard Errors of Estimated Percentages. The reliability of an estimated percentage, computed using sample data for both numerator and denominator, depends on the size of the percentage and its base. Estimated percentages are relatively more reliable than the corresponding estimates of the numerators of the percentages, particularly if the percentages are 50 percent or more. When the numerator and the denominator of the percentage are in different categories, use the parameter in the tables indicated by the numerator.

The approximate standard error, $s_{x,p}$, can be obtained by use of the formula

$$s_{x,p} = \sqrt{\frac{bp(100-p)}{x}} \tag{3}$$

Here, x is the total number of sportspersons, hunters, etc., which is the base of the percentage; p is the percentage; and b is the parameter in the tables associated with the characteristic in the numerator of the percentage.

Illustration of the Computation of the Standard Error of an Estimated Percentage

Suppose there were an estimated 13,674,000 hunters age 16 years old and older of whom 18.9 percent hunted migratory birds. From table D-2, the appropriate b parameter is 15,798. Using formula (3), the approximate standard error on the estimate of 18.9 percent is

$$s_{x,p} = \sqrt{\frac{15{,}798 * 18.9 * (100 - 18.9)}{13{,}674{,}000}} = 1.33$$

Consequently, the 95-percent confidence interval for the estimate percentage of migratory bird hunters 16 years old and older is from 16.3 percent to 21.5 percent, i.e., 18.9 ± 1.96 x 1.33.

Standard Error of a Difference. The standard error of the difference between two sample estimates is approximately equal to

$$s_{x-y} = \sqrt{s_x^2 + s_y^2} \tag{4}$$

where s_x and s_y are the standard errors of the estimates x and y. The estimates can be numbers, percentages, ratios, etc. This will represent the actual standard error quite accurately for the difference between estimates of the same characteristic in two different areas, or for the difference between separate and uncorrelated characteristics in the same area. However, if there is a high positive (negative) correlation between the two characteristics, the formula will overestimate (underestimate) the true standard error.

Illustration of the Computation of the Standard Error of a Difference

Suppose there were an estimated 13,608,000 females in the age range of 18-24 of whom 726,000 or 5.3 percent were sportspersons. Similarly, suppose there were an estimated 12,909,000 males in the same age range of whom 2,160,000 or 16.7 percent were sportspersons. The apparent difference between the percentage of female and male sportspersons is 11.4 percent. Using formula (3) and the appropriate *b* parameter from table D-2, the approximate standard errors of 5.3 percent and 16.7 percent are 0.79 and 1.35, respectively. Using formula (4), the approximate standard error of the estimated difference of 11.4 percent is

$$s_{x-y} = \sqrt{0.79^2 + 1.35^2} = 1.56$$

The 95-percent confidence interval on the difference between 18- to 24-year-old female and male sportspersons is from 8.3 to 14.5, i.e., 11.4 ± 1.96 x 1.56. Since the interval does not contain zero, we can conclude with 95 percent confidence that the percentage of 18- to 24-year-old female sportspersons is less than the percentage of 18- to 24-year-old male sportspersons.

Standard Errors of Estimated Averages. Certain mean values for sportspersons, anglers, etc., shown in the report were calculated as the ratio of two numbers. For example, average days per angler is calculated as:

$$\frac{x}{y} = \frac{total\ \ days}{total\ \ anglers}$$

Standard errors for these averages may be approximated by the use of formula (5) below.

$$s_{x/y} = \frac{x}{y}\sqrt{\left[\frac{s_x}{x}\right]^2 + \left[\frac{s_y}{y}\right]^2 - 2r\frac{s_x s_y}{xy}} \tag{5}$$

In formula (5), r represents the correlation coefficient between the numerator and the denominator of the estimate. In the above formula, use 0.7 as an estimate of r.

Illustration of the Computation of the Standard Error of an Estimated Average

Suppose that the estimated number of the average days per angler age 16 years old and older for all fishing was 16.7 days. Using formulas (1) and (2) above, we compute the standard error on total days, 553,841,000, and total anglers, 33,112,000, to be 20,329,124 and 693,033, respectively. The approximate standard error on the estimated average of 16.7 days is

$$s_{x/y} = \frac{553{,}841{,}000}{33{,}112{,}000}\sqrt{\left[\frac{20{,}329{,}124}{553{,}841{,}000}\right]^2 + \left[\frac{693{,}033}{33{,}112{,}000}\right]^2 - 2 * 0.7\frac{20{,}329{,}124 * 693{,}033}{553{,}841{,}000 * 33{,}112{,}000}} = 0.45$$

Therefore, the 95-percent confidence interval on the estimated average of 16.7 days is from 15.8 to 17.6, i.e., 16.7 ± 1.96 x 0.45.

Table D–1. Approximate Standard Errors of Resident Anglers, Days of Fishing by State Residents, and Expenditures for Fishing by State Residents

(Numbers in thousands)

State	Participation		Spenders		Days		Expenditures in dollars	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Alabama	516	57	504	57	10,176	1,516	357,716	90,155
Alaska	211	16	210	16	3,121	702	287,528	82,272
Arizona	586	71	576	71	5,283	1,014	815,074	238,352
Arkansas	467	73	429	70	15,141	4,103	430,488	194,120
California	1,700	127	1,668	126	25,662	4,251	2,619,043	581,301
Colorado	666	56	660	56	8,726	1,330	650,321	148,756
Connecticut	340	36	335	36	5,713	979	631,306	180,264
Delaware	92	9	84	9	1,681	774	61,386	24,029
Florida	1,991	137	1,869	134	49,500	9,419	3,815,000	749,904
Georgia	844	86	796	84	9,061	1,162	729,439	279,889
Hawaii	107	10	99	10	1,739	297	183,249	60,334
Idaho	289	51	258	49	2,424	688	222,276	102,475
Illinois	1,236	135	1,189	133	15,614	1,664	1,476,381	279,816
Indiana	786	82	757	81	21,542	6,448	674,233	206,854
Iowa	522	45	506	44	6,909	1,283	439,534	152,777
Kansas	434	47	382	45	4,694	1,260	295,116	106,038
Kentucky	492	68	459	66	10,245	2,494	765,584	209,457
Louisiana	733	86	642	82	18,351	6,126	619,657	225,911
Maine	197	23	191	23	2,915	646	175,364	54,699
Maryland	410	43	390	42	5,676	1,121	754,959	223,847
Massachusetts	457	31	436	31	9,166	1,823	501,764	111,876
Michigan	1,465	155	1,385	152	26,744	4,434	2,300,485	699,438
Minnesota	1,328	131	1,301	130	24,903	3,462	2,225,059	585,244
Mississippi	603	81	557	79	8,700	1,493	501,906	200,464
Missouri	870	66	814	64	14,448	1,854	550,723	110,848
Montana	192	27	189	27	3,263	909	487,763	213,977
Nebraska	197	20	193	20	2,924	684	200,150	67,480
Nevada	156	18	154	17	2,044	336	203,273	49,581
New Hampshire	164	21	159	20	4,155	1,448	283,341	106,961
New Jersey	679	54	633	53	9,578	1,856	1,319,455	254,972
New Mexico	232	28	224	28	3,868	646	397,208	92,655
New York	1,809	164	1,699	159	29,112	6,898	2,175,971	877,680
North Carolina	1,307	100	1,196	96	23,491	3,757	1,537,074	325,409
North Dakota	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Ohio	1,435	132	1,287	126	19,116	2,906	2,211,184	838,249
Oklahoma	744	89	682	87	8,661	1,585	846,818	292,371
Oregon	386	48	386	48	4,673	897	430,736	79,315
Pennsylvania	1,008	129	849	119	9,926	2,581	429,991	112,189
Rhode Island	93	7	88	7	1,764	416	106,798	31,147
South Carolina	574	67	545	66	11,459	2,626	926,021	574
South Dakota	164	27	164	27	3,649	933	187,889	70,945
Tennessee	833	83	799	82	17,834	5,611	1,437,290	382,971
Texas	2,355	251	2,079	238	34,735	12,578	1,794,236	472,996
Utah	351	34	345	34	5,612	991	397,422	109,330
Vermont	105	12	103	12	1,885	466	68,612	36,752
Virginia	707	61	663	59	10,342	3,032	956,767	218,304
Washington	914	73	893	72	17,818	5,660	1,341,601	369,846
West Virginia	239	27	237	27	4,767	1,239	469,462	204,862
Wisconsin	938	99	938	99	15,320	2,946	1,091,412	301,945
Wyoming	115	13	113	13	2,170	400	132,153	33,316

(NA) Not available.

Note: Detail does not add to total because of multiple responses. U.S. totals include responses from participants residing in the District of Columbia.

Table D–2. Approximate Standard Errors of Resident Hunters, Days of Hunting by State Residents, and Expenditures for Hunting by State Residents

(Numbers in thousands)

State	Participation		Spenders		Days		Expenditures in dollars	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Alabama	492	53	455	51	10,393	1,625	848,304	226,332
Alaska	106	11	106	11	1,096	225	372,008	123,983
Arizona	259	43	259	43	3,164	1,202	385,741	139,174
Arkansas	320	73	316	73	10,712	2,714	998,151	472,372
California	467	51	451	50	8,036	1,562	1,273,678	342,349
Colorado	160	24	160	24	1,806	552	318,534	107,481
Connecticut	82	13	82	13	1,348	602	399,943	181,076
Delaware	23	3	21	3	453	263	62,294	30,877
Florida	329	42	320	41	6,693	1,908	1,034,465	305,531
Georgia	309	45	303	44	8,318	2,844	834,292	383,021
Hawaii	23	4	23	4	786	328	56,296	24,121
Idaho	162	27	162	27	2,009	1,012	187,077	90,133
Illinois	512	100	507	99	7,786	1,648	1,312,095	388,638
Indiana	377	63	368	62	10,926	3,538	240,594	86,045
Iowa	216	31	211	31	4,163	1,497	447,229	168,993
Kansas	177	30	176	30	4,193	1,690	306,072	120,215
Kentucky	316	52	312	51	11,979	3,410	777,711	265,997
Louisiana	291	36	276	35	6,738	2,464	744,000	283,531
Maine	141	21	134	20	2,410	422	169,093	65,985
Maryland	88	19	88	19	1,418	448	282,265	122,867
Massachusetts	66	11	66	11	1,403	406	147,062	53,808
Michigan	507	84	507	84	11,358	2,280	2,514,885	766,362
Minnesota	475	53	468	52	8,053	1,973	1,151,738	361,430
Mississippi	436	70	436	70	8,755	2,087	828,282	336,525
Missouri	495	54	475	53	9,716	1,254	850,196	248,688
Montana	108	20	107	20	2,158	444	524,339	196,460
Nebraska	115	16	115	16	1,584	378	561,205	213,003
Nevada	49	10	49	10	897	230	206,443	87,845
New Hampshire	44	6	43	6	1,330	691	56,175	25,777
New Jersey	115	15	110	15	2,928	1,035	237,750	71,830
New Mexico	68	8	67	8	911	479	132,875	56,649
New York	739	89	733	89	17,741	4,707	1,512,876	716,716
North Carolina	317	53	295	51	8,177	1,850	640,268	211,010
North Dakota	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Ohio	528	78	519	77	9,066	1,855	808,017	405,030
Oklahoma	219	40	169	35	5,201	2,147	351,617	188,965
Oregon	181	32	178	32	2,264	512	226,856	53,705
Pennsylvania	703	91	687	90	17,826	5,097	995,487	277,704
Rhode Island	17	2	17	2	318	114	28,517	11,038
South Carolina	238	36	238	36	4,255	1,077	548,133	247,614
South Dakota	133	28	133	28	2,901	1,016	255,034	98,606
Tennessee	286	32	286	32	9,603	4,535	408,816	149,738
Texas	1,080	148	1,036	145	19,905	7,969	1,751,718	621,465
Utah	161	25	161	25	2,643	615	370,056	112,788
Vermont	71	10	69	10	1,618	476	323,047	195,225
Virginia	354	63	352	63	10,306	3,522	928,608	252,714
Washington	218	25	218	25	2,756	903	506,433	168,332
West Virginia	211	23	211	23	3,254	686	446,272	167,171
Wisconsin	763	94	759	94	10,219	2,142	2,262,062	666,452
Wyoming	76	12	76	12	1,171	200	152,617	40,927

(NA) Not available.

Note: Detail does not add to total because of multiple responses. U.S. totals include responses from participants residing in the District of Columbia.

Table D–3. Approximate Standard Errors of Resident Away-From-Home Participants, Days of Away-From-Home Participants by State Residents, and Trip-Related Expenditures for Away-From-Home Activities by State Residents

(Numbers in thousands)

State	Participation		Spenders		Days		Expenditures in dollars	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Alabama	340	63	171	46	1,526	710	93,185	55,424
Alaska	118	14	100	13	1,781	530	51,579	20,299
Arizona	534	57	489	54	9,488	2,322	433,685	132,310
Arkansas	120	32	102	29	1,354	613	24,866	15,765
California	2,675	226	2,382	215	28,143	4,396	2,331,567	573,878
Colorado	621	79	594	78	5,702	1,569	506,713	190,036
Connecticut	385	47	348	45	9,821	2,190	494,628	115,287
Delaware	71	8	64	8	1,622	476	95,861	31,598
Florida	1,363	161	1,239	154	11,434	2,060	1,206,226	382,981
Georgia	1,008	147	980	146	34,530	22,650	1,605,397	844,468
Hawaii	103	14	90	13	2,824	967	51,761	19,174
Idaho	220	41	207	40	3,610	1,889	81,801	42,573
Illinois	652	86	455	73	6,149	1,873	526,970	203,522
Indiana	477	66	408	61	3,483	827	404,132	192,082
Iowa	215	40	192	38	3,248	1,272	227,914	48,811
Kansas	168	35	135	32	1,157	338	48,036	16,183
Kentucky	298	45	272	43	2,686	1,010	93,567	39,353
Louisiana	221	34	192	32	4,993	2,286	442,317	278,361
Maine	110	20	91	18	4,792	2,262	49,014	18,927
Maryland	392	35	351	33	4,498	1,142	293,681	95,705
Massachusetts	453	48	404	45	9,269	1,970	272,223	60,839
Michigan	855	134	806	131	9,981	3,136	390,960	137,694
Minnesota	483	98	362	86	7,522	2,719	468,161	186,975
Mississippi	135	38	110	35	4,364	2,072	68,752	23,862
Missouri	622	85	605	84	9,364	2,829	427,866	132,714
Montana	96	16	78	15	1,409	473	143,443	54,829
Nebraska	150	26	146	26	2,564	1,099	145,444	77,436
Nevada	191	43	165	41	2,522	612	173,529	62,184
New Hampshire	89	14	84	14	1,357	323	59,358	14,898
New Jersey	564	53	476	49	8,083	1,859	576,828	189,985
New Mexico	200	29	166	26	4,589	1,403	131,576	47,280
New York	1,263	210	1,136	200	25,120	7,037	1,514,114	647,118
North Carolina	505	115	456	109	8,750	3,254	615,949	230,280
North Dakota	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Ohio	730	78	695	76	7,285	1,832	188,675	64,962
Oklahoma	411	43	394	42	3,128	767	120,334	59,569
Oregon	401	50	377	48	6,515	2,090	507,648	186,210
Pennsylvania	734	158	493	131	7,801	2,708	86,767	33,193
Rhode Island	66	9	65	9	988	312	88,059	30,587
South Carolina	219	58	198	55	3,138	1,278	145,758	55,107
South Dakota	108	13	92	12	1,151	493	35,834	13,244
Tennessee	682	147	630	142	6,346	2,031	306,802	78,400
Texas	977	158	879	150	10,885	4,487	335,013	117,313
Utah	263	35	252	34	2,985	579	129,357	44,742
Vermont	85	16	65	14	2,042	539	24,749	6,911
Virginia	553	83	518	81	4,854	1,049	354,336	110,249
Washington	693	122	659	119	12,377	3,413	415,979	121,660
West Virginia	255	77	251	76	3,337	1,742	132487	81,458
Wisconsin	453	85	327	74	5,737	2,848	268,866	156,056
Wyoming	104	11	95	11	1,276	413	51,858	18,170

(NA) Not available.

Note: Detail does not add to total because of multiple responses. U.S. totals include responses from participants residing in the District of Columbia.

Table D–4. Parameters a and b for Calculating Approximate Standard Errors of Sportspersons, Anglers, Hunters, and Wildlife-Watching Participants

(These parameters are to be used only to calculate estimates of standard errors for characteristics developed from the screening sample)

State	6 years old and older		6 to 15 years old only	
	a	b	a	b
United States, total	**–0.000043**	**12,272**	**–0.000387**	**15,783**
Alabama	–0.001517	6,503	–0.009621	5,974
Alaska	–0.001275	795	–0.010120	986
Arizona	–0.000765	4,622	–0.003646	3,484
Arkansas	–0.001766	4,647	–0.014655	5,761
California	–0.000236	7,936	–0.002632	13,492
Colorado	–0.000805	3,719	–0.006685	4,508
Connecticut	–0.000429	1,384	–0.004817	2,149
Delaware	–0.000758	614	–0.009410	1,051
Florida	–0.000354	6,040	–0.004700	10,400
Georgia	–0.000756	6,717	–0.003496	4,981
Hawaii	–0.000603	694	–0.007618	1,184
Idaho	–0.001708	2,389	–0.017208	3,904
Illinois	–0.000633	7,425	–0.005382	9,348
Indiana	–0.000849	4,951	–0.012557	10,925
Iowa	–0.000988	2,714	–0.008723	3,356
Kansas	–0.001014	2,584	–0.009102	3,499
Kentucky	–0.001476	5,802	–0.009316	5,165
Louisiana	–0.000840	3,418	–0.014093	8,744
Maine	–0.001824	2,210	–0.016808	2,441
Maryland	–0.000570	2,976	–0.008290	6,120
Massachusetts	–0.000394	2,406	–0.003000	2,365
Michigan	–0.001153	10,458	–0.009872	12,626
Minnesota	–0.001905	9,166	–0.015878	10,749
Mississippi	–0.001191	3,137	–0.012208	5,053
Missouri	–0.000858	4,672	–0.004859	3,768
Montana	–0.001690	1,418	–0.015626	1,816
Nebraska	–0.001546	2,519	–0.015670	3,805
Nevada	–0.000431	1,029	–0.007455	2,739
New Hampshire	–0.000920	1,125	–0.015100	2,356
New Jersey	–0.000359	2,868	–0.003386	3,831
New Mexico	–0.000706	1,294	–0.006025	1,703
New York	–0.000416	7,444	–0.005818	13,956
North Carolina	–0.000905	7,706	–0.008882	11,091
North Dakota	(NA)	(NA)	(NA)	(NA)
Ohio	–0.000807	8,454	–0.006870	10,159
Oklahoma	–0.001132	3,772	–0.008501	4,297
Oregon	–0.001359	4,806	–0.010991	5,226
Pennsylvania	–0.000593	6,843	–0.005995	9,017
Rhode Island	–0.000308	300	–0.003287	405
South Carolina	–0.000739	3,060	–0.005611	3,303
South Dakota	–0.001620	1,194	–0.034414	3,643
Tennessee	–0.000730	4,204	–0.003532	2,887
Texas	–0.000807	18,178	–0.004712	18,120
Utah	–0.001050	2,638	–0.008515	4,056
Vermont	–0.001401	811	–0.014942	1,003
Virginia	–0.000533	3,805	–0.004771	4,816
Washington	–0.000640	3,938	–0.006644	5,691
West Virginia	–0.001618	2,714	–0.015297	3,266
Wisconsin	–0.002449	12,656	–0.016762	11,855
Wyoming	–0.002057	1,013	–0.029622	2,038

(NA) Not available.

Table D–5. Parameters a and b for Calculating Approximate Standard Errors for Levels for the Detailed Sportspersons Sample

State	Sportspersons and anglers 16 years old and older		Hunters 16 years old and older	
	a	b	a	b
United States, total	**–0.000070**	**16,823**	**–0.000066**	**15,798**
Alabama	–0.002013	7,375	–0.001789	6,556
Alaska	–0.003854	2,028	–0.002828	1,488
Arizona	–0.001928	9,801	–0.001483	7,539
Arkansas	–0.006403	14,328	–0.008765	19,615
California	–0.000352	10,066	–0.000199	5,673
Colorado	–0.001432	5,651	–0.000959	3,784
Connecticut	–0.001549	4,309	–0.000814	2,264
Delaware	–0.001485	1,038	–0.000692	484
Florida	–0.000737	10,943	–0.000364	5,407
Georgia	–0.001334	9,948	–0.000897	6,692
Hawaii	–0.001157	1,151	–0.000846	842
Idaho	–0.010247	12,009	–0.004564	5,348
Illinois	–0.001679	16,769	–0.002058	20,557
Indiana	–0.002038	10,118	–0.002294	11,391
Iowa	–0.002068	4,887	–0.002076	4,905
Kansas	–0.002932	6,342	–0.002590	5,602
Kentucky	–0.003245	10,954	–0.002763	9,328
Louisiana	–0.003723	12,838	–0.001421	4,899
Maine	–0.003040	3,241	–0.003340	3,561
Maryland	–0.001084	4,855	–0.000949	4,252
Massachusetts	–0.000437	2,325	–0.000367	1,950
Michigan	–0.002590	20,167	–0.001899	14,792
Minnesota	–0.004611	19,060	–0.001598	6,606
Mississippi	–0.006731	14,944	–0.006339	14,075
Missouri	–0.001315	6,139	–0.001437	6,706
Montana	–0.006507	5,056	–0.005775	4,488
Nebraska	–0.001667	2,313	–0.001801	2,498
Nevada	–0.001056	2,136	–0.001108	2,241
New Hampshire	–0.002879	3,070	–0.000896	956
New Jersey	–0.000704	4,827	–0.000287	1,967
New Mexico	–0.002617	4,059	–0.000648	1,006
New York	–0.001079	16,730	–0.000725	11,247
North Carolina	–0.001281	9,305	–0.001279	9,290
North Dakota	(NA)	(NA)	(NA)	(NA)
Ohio	–0.001605	14,444	–0.001351	12,159
Oklahoma	–0.005114	14,461	–0.002771	7,836
Oregon	–0.002276	6,968	–0.001995	6,108
Pennsylvania	–0.001820	18,266	–0.001269	12,740
Rhode Island	–0.000764	649	–0.000291	247
South Carolina	–0.002655	9,438	–0.001677	5,961
South Dakota	–0.009550	6,028	–0.011761	7,424
Tennessee	–0.002018	9,981	–0.000754	3,728
Texas	–0.001644	30,704	–0.001150	21,490
Utah	–0.001969	4,009	–0.002043	4,159
Vermont	–0.003247	1,662	–0.003046	1,559
Virginia	–0.000965	5,920	–0.001933	11,864
Washington	–0.001320	6,986	–0.000561	2,971
West Virginia	–0.002455	3,594	–0.001928	2,822
Wisconsin	–0.002985	13,311	–0.003141	14,006
Wyoming	–0.004945	2,095	–0.005055	2,141

(NA) Not available.

Table D–6. Parameters a, b, and c for Calculating Approximate Standard Errors for Expenditures for the Detailed Sportspersons Sample

State	Sportspersons and anglers 16 years old and older			Hunters 16 years old and older		
	a	b	c	a	b	c
United States, total	**0.001159**	**–575,615**	**45,670**	**0.001923**	**–978,460**	**44,416**
Alabama	0.021918	–163,227	21,197	0.026237	–310,700	20,618
Alaska	0.068721	–3,823	2,765	0.086885	–80,157	2,587
Arizona	0.072204	–64,996	7,713	0.112668	32,711	4,512
Arkansas	0.190512	–51,366	5,554	0.208269	3,305	4,958
California	0.041958	323,332	11,979	0.056429	1,177,647	6,717
Colorado	0.038767	15,704	8,931	0.080446	–49,174	5,370
Connecticut	0.062963	–54,211	6,250	0.156423	–403,680	4,065
Delaware	0.138101	–7,091	1,280	0.206480	–291	823
Florida	0.031125	129,668	13,980	0.044416	–273,423	13,786
Georgia	0.133758	–35,054	10,761	0.180457	–30,025	9,196
Hawaii	0.099271	–1,810	905	0.154210	–1,865	677
Idaho	0.197816	–5,230	3,806	0.216778	170,971	2,339
Illinois	0.016086	–95,430	23,661	0.059422	–369,151	14,496
Indiana	0.084408	56,304	7,293	0.113115	42,035	5,378
Iowa	0.110741	–6,756	5,107	0.110417	–42,038	6,849
Kansas	0.119262	–8,287	3,770	0.130458	–38,144	4,212
Kentucky	0.032291	–262,907	19,693	0.050336	–549,944	21,014
Louisiana	0.125543	72,794	4,657	0.123353	–129,712	6,086
Maine	0.073133	–64,912	4,685	0.133009	–24,957	2,602
Maryland	0.069557	–8,036	7,163	0.119862	–92,688	6,155
Massachusetts	0.041124	13,503	3,733	0.092555	–231	2,727
Michigan	0.071988	–130,103	28,404	0.026267	–153,883	33,794
Minnesota	0.056048	–43,079	17,112	0.064508	–189,054	15,975
Mississippi	0.143495	–50,131	8,984	0.146486	14,053	8,097
Missouri	0.027623	–7,268	10,503	0.066759	–24,068	8,944
Montana	0.178611	–16,817	2,622	0.105263	–209,610	3,801
Nebraska	0.100459	–1,618	2,551	0.119872	–19,296	2,785
Nevada	0.040428	–34,230	2,962	0.141457	–114,260	1,968
New Hampshire	0.127497	6,106	2,383	0.176749	14,447	1,443
New Jersey	0.027546	11,544	6,195	0.036515	–45,032	6,045
New Mexico	0.036052	–17,835	4,123	0.147509	–35,750	2,313
New York	0.152342	–343,859	17,854	0.209665	–176,671	10,911
North Carolina	0.029116	–209,241	18,945	0.064157	–163,564	13,190
North Dakota	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Ohio	0.128010	–37,131	20,232	0.216544	–1,019,186	18,675
Oklahoma	0.098427	–170,608	14,307	0.276027	126,332	2,101
Oregon	0.010568	7,416	9,002	0.011236	96,792	7,900
Pennsylvania	0.039841	–43,889	24,057	0.037830	–316,859	27,692
Rhode Island	0.077596	–203.9579	657	0.110230	–39,344	696
South Carolina	0.180012	–120,717	6,857	0.181351	–87,421	5,445
South Dakota	0.114248	–43,160	4,683	0.102506	–203,831	6,355
Tennessee	0.051884	–61,213	15,306	0.073335	–522,076	17,760
Texas	0.049244	–64,415	42,177	0.077228	–819,919	50,873
Utah	0.063366	–20,537	4,266	0.066238	–2,994	4,293
Vermont	0.271264	–10,725	1,629	0.339375	–128,675	1,810
Virginia	0.034590	–93,405	11,648	0.037134	–222,277	13,083
Washington	0.067952	22,119	7,169	0.080042	–119,224	6,687
West Virginia	0.173583	–44,746	4,014	0.117366	–52,107	4,868
Wisconsin	0.045614	–215,022	29,192	0.057107	164,685	22,483
Wyoming	0.037366	–31,308	2,986	0.032006	–10,196	3,038

(NA) Not available.

Table D–7. Parameters a, b, and c for Calculating Approximate Standard Errors for Days or Trips for the Detailed Sportspersons Sample

State	Sportspersons and anglers 16 years old and older			Hunters 16 years old and older		
	a	b	c	a	b	c
United States, total	**0.000068**	**–160,414**	**51,951**	**–0.000284**	**–127,863**	**46,699**
Alabama	–0.006409	–33,141	16,434	–0.001309	–24,163	13,815
Alaska	0.040044	–1,378	2,306	0.014819	–3,686	3,262
Arizona	0.010858	–12,760	16,639	0.094988	–10,415	13,604
Arkansas	0.029081	–47,335	22,178	–0.069327	–298,461	51,645
California	0.018455	62,656	11,126	0.002617	35,822	14,331
Colorado	0.012264	–4,831	7,675	0.057492	–4,094	6,123
Connecticut	0.010321	–20,427	7,687	0.178663	1,319	1,609
Delaware	0.202009	–718	940	0.322859	–120	316
Florida	0.030335	–13,138	12,228	0.050279	–17,145	11,045
Georgia	–0.016400	–22,749	29,830	0.034924	–19,534	26,050
Hawaii	0.011790	–1,565	1,950	0.134936	–560	912
Idaho	0.044270	113	10,482	0.221214	–2,323	5,468
Illinois	–0.005565	–7,990	21,553	–0.015684	–60,913	34,960
Indiana	0.079426	–2,044	8,077	0.088709	7,770	5,819
Iowa	0.012302	–22,937	13,314	0.074986	–46,595	14,146
Kansas	0.061820	–2,259	4,674	0.158439	10,639	277
Kentucky	0.023655	–6,641	17,832	0.015712	–15,751	21,050
Louisiana	0.105459	53,216	2,251	0.124945	55,464	167
Maine	0.026901	–3,659	4,612	–0.011197	–41,449	8,337
Maryland	0.023534	–8,872	6,975	0.039987	–4,806	5,572
Massachusetts	0.032450	–2,312	3,371	0.038816	–2,548	3,080
Michigan	0.006455	–21,327	31,990	–0.023017	–23,908	33,169
Minnesota	0.000310	–20,823	26,365	0.008351	–106,597	30,823
Mississippi	0.001714	–39,317	19,444	0.020445	–27,887	17,239
Missouri	0.004697	–8,884	10,776	–0.002402	9,637	8,938
Montana	0.055324	–1,581	4,356	–0.059715	–48,367	13,442
Nebraska	0.037329	–2,510	3,593	0.034127	–72	2,640
Nevada	0.005007	–8,090	4,055	0.008052	600	2,787
New Hampshire	0.112057	177	1,530	0.259509	1,299	402
New Jersey	0.030384	–392	4,901	0.103886	9	2,432
New Mexico	–0.011244	–8,297	9,568	0.230217	–2,553	3,300
New York	0.046461	–16,384	18,549	0.060195	14,380	6,931
North Carolina	0.013151	–7,442	16,655	–0.007341	–5,733	18,773
North Dakota	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Ohio	0.008805	44,579	17,178	–0.000533	–55,316	25,603
Oklahoma	0.010053	17,862	15,896	0.135080	27,988	6,568
Oregon	0.017087	–5,837	8,095	0.009877	–8,838	8,179
Pennsylvania	0.050758	–16,535	18,668	0.056836	–15,548	18,131
Rhode Island	0.046582	–1,416	914	0.102558	–994	499
South Carolina	0.039217	–3,630	7,815	0.020949	–8,305	10,720
South Dakota	–0.000329	–9,205	11,194	0.070309	–4,221	7,158
Tennessee	0.084448	–9,998	12,576	0.203468	–3,342	5,689
Texas	0.114686	–85,855	44,518	0.128279	–71,291	38,430
Utah	0.009602	–5,402	7,922	0.007556	–7,585	7,951
Vermont	0.042093	–2,395	2,132	0.067655	–2,349	1,435
Virginia	0.079698	778	4,363	0.112100	9,122	1,340
Washington	0.095993	–3,056	4,652	0.084185	–13,640	6,129
West Virginia	0.042905	–11,238	6,458	0.012519	–13,442	7,608
Wisconsin	0.014256	–12,514	22,081	0.021117	–19,455	18,855
Wyoming	–0.003362	–3,606	4,480	–0.030790	–4,007	4,809

(NA) Not available.

Table D–8. Parameters a and b for Calculating Approximate Standard Errors for Levels of Wildlife-Watching Participants for the Detailed Wildlife-Watching Sample

State	Away–from–home participants		Wildlife–watching participants[1]	
	a	b	a	b
United States, total	**–0.000134**	**32,078**	**–0.000119**	**28,477**
Alabama	–0.003523	12,908	–0.009869	36,163
Alaska	–0.004221	2,221	–0.005350	2,815
Arizona	–0.001319	6,703	–0.001925	9,787
Arkansas	–0.003939	8,814	–0.003938	8,814
California	–0.000739	21,116	–0.000937	26,764
Colorado	–0.003019	11,913	–0.003309	13,057
Connecticut	–0.002392	6,653	–0.002609	7,256
Delaware	–0.001438	1,005	–0.002547	1,780
Florida	–0.001411	20,956	–0.001591	23,634
Georgia	–0.003335	24,875	–0.007832	58,421
Hawaii	–0.002051	2,041	–0.001805	1,797
Idaho	–0.007948	9,315	–0.008539	10,006
Illinois	–0.001219	12,172	–0.001994	19,916
Indiana	–0.002020	10,030	–0.006775	33,637
Iowa	–0.003386	8,000	–0.003220	7,607
Kansas	–0.003728	8,064	–0.003222	6,969
Kentucky	–0.002201	7,431	–0.005428	18,327
Louisiana	–0.001619	5,582	–0.009544	32,914
Maine	–0.003739	3,986	–0.006455	6,881
Maryland	–0.000762	3,414	–0.001982	8,879
Massachusetts	–0.001036	5,512	–0.001839	9,783
Michigan	–0.003032	23,610	–0.003331	25,940
Minnesota	–0.005468	22,603	–0.006274	25,934
Mississippi	–0.005131	11,393	–0.005454	12,110
Missouri	–0.002842	13,264	–0.003139	14,653
Montana	–0.004110	3,194	–0.004772	3,708
Nebraska	–0.003608	5,004	–0.004078	5,656
Nevada	–0.005369	10,865	–0.004111	8,319
New Hampshire	–0.002275	2,425	–0.002428	2,589
New Jersey	–0.000795	5,449	–0.001272	8,715
New Mexico	–0.003021	4,686	–0.004748	7,364
New York	–0.002450	37,975	–0.002910	45,114
North Carolina	–0.003857	28,014	–0.004098	29,769
North Dakota	(NA)	(NA)	(NA)	(NA)
Ohio	–0.001006	9,055	–0.003043	27,382
Oklahoma	–0.001850	5,230	–0.005081	14,367
Oregon	–0.002304	7,055	–0.004554	13,942
Pennsylvania	–0.003639	36,519	–0.004874	48,914
Rhode Island	–0.001580	1,340	–0.001829	1,552
South Carolina	–0.004536	16,126	–0.004877	17,337
South Dakota	–0.002833	1,788	–0.013684	8,638
Tennessee	–0.007450	36,840	–0.004097	20,260
Texas	–0.001436	26,817	–0.001909	35,657
Utah	–0.002560	5,211	–0.002329	4,741
Vermont	–0.007044	3,605	–0.006399	3,275
Virginia	–0.002247	13,787	–0.002743	16,828
Washington	–0.004645	24,585	–0.003371	17,846
West Virginia	–0.019113	27,981	–0.015998	23,421
Wisconsin	–0.004020	17,926	–0.005124	22,851
Wyoming	–0.003576	1,515	–0.004694	1,988

(NA) Not available

[1] Use these parameters for total wildlife-watching participants and around-the-home participants.

Table D–9. Parameters a, b, and c for Calculating Approximate Standard Errors for Expenditures and Days or Trips for Wildlife-Watching Sample

State	Expenditures			Days or trips		
	a	b	c	a	b	c
United States, total	**0.001308**	**–1,548,024**	**112,362**	**0.002307**	**826,023**	**54,100**
Alabama	0.292431	–9,893	10,505	–0.079778	174,629	61,748
Alaska	0.108738	–34,916	4,682	0.016446	–58,833	12,421
Arizona	0.077675	–4,716	7,536	–0.027772	286,426	30,687
Arkansas	0.313406	–11,247	9,078	0.062790	–194,867	34,370
California	0.048430	–43,155	28,990	0.006079	–38,139	52,624
Colorado	0.124349	–14,729	9,702	0.026976	183,987	10,254
Connecticut	0.007486	–436,089	16,607	–0.024420	125,914	23,606
Delaware	0.061895	–18,947	3,005	–0.074027	13,351	10,785
Florida	0.083730	104,408	21,053	0.007541	–194,343	57,112
Georgia	0.249488	–25,092	26,678	0.050793	–3,332,773	479,805
Hawaii	0.120445	–32,991	1,567	0.083382	–9,149	3,825
Idaho	0.223371	–147,314	10,203	–0.062345	–258,027	89,698
Illinois	0.107605	–13,356	18,919	0.044699	–354,008	68,862
Indiana	0.193872	–322,885	13,396	–0.040883	–166,121	69,136
Iowa	0.021305	94,648	4,636	0.079467	–75,095	20,869
Kansas	0.072491	6,025	5,519	–0.013518	–72,502	27,154
Kentucky	0.157856	–96,510	5,459	0.029898	–95,012	43,749
Louisiana	0.362140	107,638	6,464	0.246426	368,942	–24,469
Maine	0.094142	–35,394	5,069	0.150679	–50,401	9,088
Maryland	0.095353	39,360	3,760	–0.020442	–46,263	37,328
Massachusetts	0.014009	–163,624	14,762	–0.020104	–59,530	32,483
Michigan	0.072396	489	41,625	0.046186	1,002,661	–40,953
Minnesota	0.096860	–27,052	22,699	0.018847	–405,415	80,062
Mississippi	0.040018	23,616	8,811	–0.060202	–43,904	39,904
Missouri	0.077023	–29,229	11,649	0.021741	–290,522	62,546
Montana	0.102248	27,322	3,406	–0.004215	–16,717	12,349
Nebraska	0.250670	–146,886	4,935	0.027770	347,687	3,046
Nevada	0.100312	–90,487	4,723	–0.038534	–44,832	21,999
New Hampshire	0.024368	–13,607	3,264	0.043269	9,164	578
New Jersey	0.089631	–120,587	9,071	–0.020528	–231,435	57,548
New Mexico	0.110251	1,905	3,130	0.021449	197,267	5,813
New York	0.122911	–1,425,885	68,948	0.006340	–44,103	93,311
North Carolina	0.017031	–326,265	56,212	–0.058093	–593,772	133,445
North Dakota	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Ohio	0.080684	–39,489	26,461	0.001012	–1,543	45,574
Oklahoma	0.235454	57,625	3,593	0.014729	–152,377	38,659
Oregon	0.099298	–158,238	13,407	0.010117	–157,164	46,869
Pennsylvania	0.084612	–12,972	30,509	–0.007189	–465,695	137,527
Rhode Island	0.097369	–15,709	1,525	–0.006225	65,378	2,641
South Carolina	0.063035	–24,816	15,855	0.022948	–180,925	43,937
South Dakota	0.071413	123,949	5,679	0.089793	–8,087	10,884
Tennessee	0.031635	–32,698	21,276	0.086824	–18,925	12,703
Texas	0.072728	–140,319	44,225	0.058100	–1,079,923	206,159
Utah	0.085970	–75,950	8,631	–0.041299	–141,530	33,231
Vermont	0.038545	–10,496	2,590	–0.014657	6,845	6,875
Virginia	0.077984	46,506	9,684	–0.013749	–12,650	34,877
Washington	0.046435	–44,547	25,839	–0.074088	–88,929	109,017
West Virginia	0.369202	18,732	2,180	0.243904	–8,874	7,939
Wisconsin	0.256246	–223,513	26,643	–0.019357	–228,892	138,515
Wyoming	0.098137	502	2,339	0.039285	–9,043	7,534

(NA) Not available.

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Revised October 2018