

# Fishing in Maine in 2013:

A statewide and regional analysis of participation  
and economic contributions

For:

Maine Office of Tourism &

Maine Department of Inland Fisheries and Wildlife

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A S S O C I A T E S

FISH AND WILDLIFE ECONOMICS AND STATISTICS

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*This document is the second installment in a three-part series examining the economic contributions of hunting and fishing in Maine and the market potential for increased participation. The first report focuses on hunting in Maine. This report focuses on fishing. The third report is a market analysis that looks at the preferences and amenities that attract sportsmen to hunting and fishing destinations.*

## Executive Summary

Recreational fishing can be a powerful contributor to state and local communities across the country, bringing in outside dollars that generate additional spending, supporting and creating jobs, and building future investments in open spaces and recreational areas.

The Maine Office of Tourism and Maine Department of Inland Fisheries and Wildlife (DIF&W) commissioned a study of the state's sporting population to examine statewide and regional fishing activity as well as the characteristics of fishing trips including the duration, purpose, destination, lodging and amenities associated with resident and visiting anglers. Drawing from license sales records and survey-based information, this report focuses on the economic contributions associated with spending in Maine by freshwater anglers. The study quantifies the total economic contributions generated by freshwater angler spending in each of the state's eight tourism regions across all freshwater anglers and separately for anglers who fish open water and those who fish through the ice in winter.

Table E1. Participation and spending by freshwater anglers in Maine in 2013.

Activity	Anglers*	Total Annual Spending**
All freshwater fishing	258,774	\$208,808,028
Open water fishing	237,406	\$160,528,549
Ice fishing	68,475	\$48,279,479

. \*Derived from Maine DIF&W's fishing license sales database and the percent of respondents reporting they freshwater fished. The estimated number of anglers includes all residents and nonresidents who purchased a fishing privilege in 2013. The numbers do not include anglers who held a lifetime license that was purchased prior to 2013 if they did not purchase an additional fishing permit in 2013.

\*\*Includes spending only when the primary purpose of a trip was fishing.

Maine's freshwater fisheries draw thousands of resident and non-resident sportsmen to take a trip to fish each year (Table E1). These freshwater anglers spend \$208.8 million on fishing-related goods and services (Table E1).<sup>1</sup> Collectively, that spending supports 3,330 full- and part-time jobs providing more than \$104.8 million in income (Table E2). The direct spending by sportsmen who freshwater fish and the multiplier effects of that spending in Maine contribute \$176.0 million to the state's gross state product and a total economic output of \$319.2 million.

Table E2. Total economic contributions of recreational freshwater fishing on Maine's economy in 2013

	Employment	Labor Income	Value Added (State GDP)	Total Output
All fishing	3,330	\$104,792,016	\$175,954,478	\$319,178,335
Open water fishing	2,542	\$81,651,188	\$134,386,165	\$245,555,584
Ice fishing	788	\$23,140,828	\$41,568,313	\$73,622,751

<sup>1</sup> This estimate includes only spending when the primary purpose of the trip was fishing.

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## Introduction

In January 2012, the Task Force to Examine the Decline in the Number of Nonresident Hunters issued a final report laying out their findings and several recommendations to strengthen the state's nonresident sportsmen population. Recommendations within the Task Force's report included the implementation of a survey to explore the characteristics, behaviors, and spending patterns of Maine's current and lapsed nonresident hunter populations. The Task Force then recommends using research findings to develop direct marketing strategies and tools to promote Maine as a destination state for hunting.

The survey effort was expanded beyond Maine's nonresident hunting population to include all hunters, all anglers, as well as a general population survey of those who had traveled to the state to hunt or fish. The first effort investigated Maine's hunting population. This second report is an extension of that work and examines Maine's angling population. Specifically, this study quantifies recreational freshwater angling activity and associated spending in Maine in 2013. Economic contributions attributable to freshwater fishing-related spending are estimated for the state and eight tourism regions (Figure 1). Two sub-categories of recreational angling based upon water type are also analyzed to determine their individual share of the total economic contribution of recreational freshwater fishing.

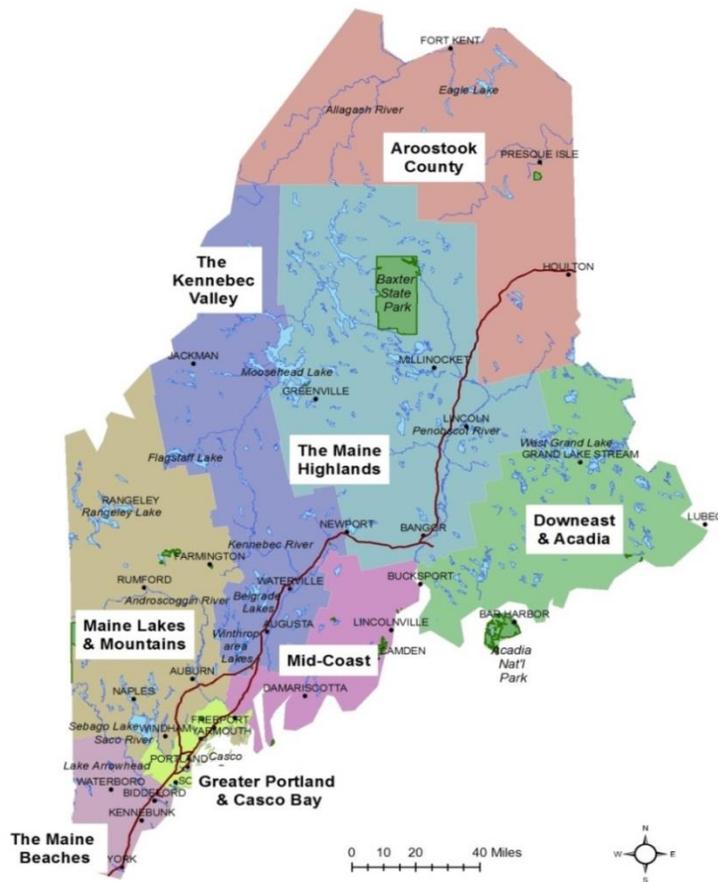


Figure 1. Map of Maine highlighting tourism regions, landmarks, and major waterways

The goal of the study is to determine the amount of spending by sportsmen and their associated contributions to the state’s economy. The results will help inform discussions among Legislators, Agency personnel, and other stakeholders to assist with strategic decision making associated with wildlife resources. The economic contributions associated with recreational freshwater angling can be a powerful economic engine for communities across Maine, generating additional spending, supporting and creating jobs, and building future investments in open spaces and wildlife areas.

## Data collection

An online survey was conducted in August of 2014. The target audience for the survey was developed using historical license sales data provided by Maine’s Department of Inland Fisheries and Wildlife (DIF&W). The primary audience for this research effort was recreational fishing and included all persons who purchased a fishing or combination hunting/fishing license between 2009 and 2013. The sampling frame was narrowed to fishing license records that included an email address (Table 1).<sup>2</sup> Included within the final sample are anglers who fished freshwater or saltwater.

The survey was conducted by inviting anglers via an email message to click on a hyperlink in the message that would connect them to the online questionnaire. The first email invitation was sent on August 20, 2014. Each person in the sample received up to two additional reminders if they did not complete a questionnaire.

The email invitations and follow-up reminders were sent by the DIF&W. The survey generated an average response rate of 15% across all anglers.

Table 1. Target audience size and response rate

	Nonresidents	Residents	Total
Original email list	52,044	62,793	114,837
Undeliverable addresses	4,311	8,923	13,234
Net mailout	47,733	53,870	101,603
Responses	8,181	6,827	15,008
<i>Response rate</i>	<i>17%</i>	<i>13%</i>	<i>15%</i>

The raw survey data were cleaned to eliminate outliers and out-of-range responses. Survey respondents are more avid than the average angler (based on the number of years fished from 2009 to 2013) and were older than the average angler (Table 2). To adjust for this, survey data were weighted to represent the population of Maine’s licensed anglers based on demographic and participation information generated from the license database. A rake weighting procedure was used to adjust for all differences across the dimensions shown in Table 2. With the calculated weights applied to the analysis, the final sample mirrored the population of sportsmen on the relevant demographic measures.

<sup>2</sup> Maine DIF&W license sales records include email addresses for approximately one-half of sportsmen who purchased a license in the past five years.

Table 2. Population of Maine anglers vs. survey respondents

Demographic	Resident Population		Resident Respondents		Nonresident Population		Nonresident Respondents	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
<b>Gender:</b>								
Male	237,342	72%	5,277	79%	173,870	83%	7,349	92%
Female	93,930	28%	1,434	21%	34,490	17%	673	8%
<i>Total</i>	<i>331,272</i>	<i>100%</i>	<i>6,711</i>	<i>100%</i>	<i>208,360</i>	<i>100%</i>	<i>8,022</i>	<i>100%</i>
<b>Age Group:</b>								
Under 18	1,352	0%	20	0%	9,897	5%	42	1%
18 to 24	37,457	11%	230	3%	23,028	11%	111	1%
25 to 34	65,615	19%	920	14%	31,124	15%	666	8%
35 to 44	63,664	19%	1,165	17%	31,892	15%	1,082	14%
45 to 54	75,155	22%	1,688	25%	43,450	21%	1,795	22%
55 to 64	65,486	19%	1,772	26%	37,897	18%	2,230	28%
65 and Over	33,624	10%	916	14%	32,764	16%	2,096	26%
<i>Total</i>	<i>342,353</i>	<i>100%</i>	<i>6,711</i>	<i>100%</i>	<i>210,052</i>	<i>100%</i>	<i>8,022</i>	<i>100%</i>
<b>Avidity:</b>								
Every year	77,058	23%	5,666	84%	13,610	6%	5,095	64%
Every other year	82,065	24%	500	8%	26,369	13%	1,159	14%
Every 3 to 5 years (or less)	183,231	54%	545	8%	170,079	81%	1,768	22%
<i>Total</i>	<i>342,354</i>	<i>100%</i>	<i>6,711</i>	<i>100%</i>	<i>210,058</i>	<i>100%</i>	<i>8,022</i>	<i>100%</i>

## Methodology

The focus of this research effort was on recreational freshwater fishing. Some information regarding saltwater anglers was gathered through the screening question process and is included in this report. The bulk of the survey was structured to gather general angling information plus detailed spending and participation information by freshwater fishing type (open water fishing or ice fishing) and tourism region. To avoid respondent fatigue from repeating detailed questions for both water types, the survey was designed to dynamically adjust to ask detailed questions of each respondent about only one water type that they fished. Procedures were in place to ensure adequate sample sizes for each type of freshwater angler from which to build participation and spending estimates.

Maine's eight tourism regions include:

- Aroostook County
- Downeast and Acadia
- Greater Portland and Casco Bay
- The Kennebec Valley
- Maine's Lakes and Mountains
- Mid-Coast
- The Maine Beaches
- The Maine Highlands (Bangor-Katahdin-Moosehead Lake)

Three measures (participation, spending, and estimated economic contribution) for each water type and tourism region structure the methodological approach.

### *Participation*

The fishing license data for Maine resident and nonresident adult anglers is the source for the overall number of anglers in 2013. Survey respondents were asked to report their participation or level of activity for every tourism region in which they fished or made expenditures in 2013, as well as the type of water visited when fishing. The survey was also set up to query respondents as to the number of days they fished in each tourism region and whether those days were a one-day trip or an overnight trip as well as the primary purpose for their trip.

### *Spending*

Expenditure questions were used to build spending profiles for the average angler of each type of fishing (detailed spending profiles are included in Appendix D). In broad terms, the expenditure questions in the survey mirror the categories included in the U.S. Fish and Wildlife Service's National Survey of Fishing, Hunting and Wildlife-Associated Recreation. Questions solicited three types of expenses:

- Trip-related expenses, which include primarily consumables such as fuel, food, and lodging.
- Fishing-specific expenses, which include special purpose items and services such as rods, reels, lines, lures, tackle boxes, depth finders, taxidermy and mounting, etc.
- Fishing-related equipment includes ATVs, campers or camping equipment, vehicles, and property purchased specifically for the purpose of fishing. In the case of special equipment (vehicles, property, etc.), respondents were asked to report the percentage for which the item is used specifically for fishing in Maine.

Regional estimates of spending are based on specific information provided by respondents. Rather than rely on residence or places where fishing occurred, respondents were asked directly to report where they made expenditures for their different types of spending (e.g., trip-related spending, equipment purchases, etc.). Total spending by expenditure category was first estimated at the statewide level. The total statewide estimate was then allocated to each tourism region based on the proportion of each category spending that took place in each region.

Angling activity and its associated spending can be the primary or a secondary purpose of a trip to or within Maine. The analysis in this report focuses on only that spending and its associated economic contributions which occur when fishing is the primary purpose of a trip. Given the information provided by respondents, fishing-related spending that occurred as a secondary activity is estimated to be \$50.2 million (not including transportation, food or lodging expenses incurred on those trips). Total spending (including transportation, food and lodging expenses) when fishing was a secondary activity is estimated to be \$95.4 million. This fishing-related activity and the associated spending are not included in the estimates included in the remainder of the report because they are identified as a secondary purpose of a trip. The argument for exclusion being that this spending would not have occurred in the absence of the primary purpose of the trip. And, their inclusion would overstate future estimates of annual economic contributions attributable to angling activity based off of these findings.

## *Economic contributions*

There are three types of economic contributions that anglers provide to Maine's economy: direct, indirect and induced. A direct contribution is defined as the economic contribution of the initial purchase made by the consumer (the original retail sale). Indirect contributions are the secondary effects generated from direct expenditures, such as the retailer buying additional inventory, and the wholesaler and manufacturers buying additional materials. Indirect contributions affect the industries that supply the first industry and so on down the supply chain. An induced contribution results from the salaries and wages paid by the directly and indirectly effected industries. The employees of these industries spend their income on various goods and services. These expenditures, in turn, create a continual cycle of indirect and induced effects.

The direct, indirect and induced contribution effects sum together to provide the overall economic contribution of the activity under study. As the original retail purchase (direct contribution) goes through round after round of indirect and induced effects, the economic contribution of the original purchase is multiplied, benefiting many industries and individuals.

An IMPLAN input-output model of the Maine economy was created for this analysis. Regional economic contributions are calculated based upon the statewide model and the reported percentage of spending in each region. Thus, regional estimates reflect each region's contribution to the statewide economy.

Four types of economic activity are measured and reported for each activity and target species:

*Employment:* The number of full- and part-time jobs created or supported as a result of the economic activity.

*Labor income:* Total payroll, including salaries, wages and benefits paid to employees and business proprietors

*State GDP:* This represents the total "value added" contribution of economic output made by the industries impacted by angler spending.

*Output:* The number reports the value of total economic activity associated with angler spending.

Throughout this report, the term "economic contributions" is used rather than "economic impact." Technically, economic impacts refer to the effect of new money being introduced into a market. In this case, the state of Maine is the "market". Because this study examines expenditures by Maine residents made within Maine, the total economic activity associate with angler spending cannot be considered as an economic impact. However, nonresident expenditures within the state do represent an economic impact as new money is brought into the state by this user group.

Additional discussions about economic contribution concepts are provided in Appendix C. Details of the economic contribution methodology are presented in Appendix B.

The remainder of this report is structured in sections based around the size of the angler population, their visits to or in Maine, their spending, and the economic contributions associated with their spending.

## Findings

### *Angler participation*

The composition of Maine's resident anglers who fished the past five years consists of a diversity of backgrounds when it comes to fishing experience in the state. Twenty-two percent of anglers began fishing in the state on a regular basis before 1970. Between 16% and 18% percent of anglers indicate they began fishing in the state during each of the decades between 1970 and 2000 (Figure 2). The state experienced slightly smaller growth in the angling population between 2000 and 2010 when only 10% indicated they started fishing during that time. Seventeen percent of resident anglers started fishing since 2010.

Conversely, a substantial proportion of recent nonresident anglers do not have a long history of fishing in Maine. The greatest percent of nonresident anglers report that they began fishing in Maine within the last five years (Figure 2). Increasingly fewer nonresident anglers began fishing in the state in each of the decades prior to the current period, ranging between 6% and 9%.

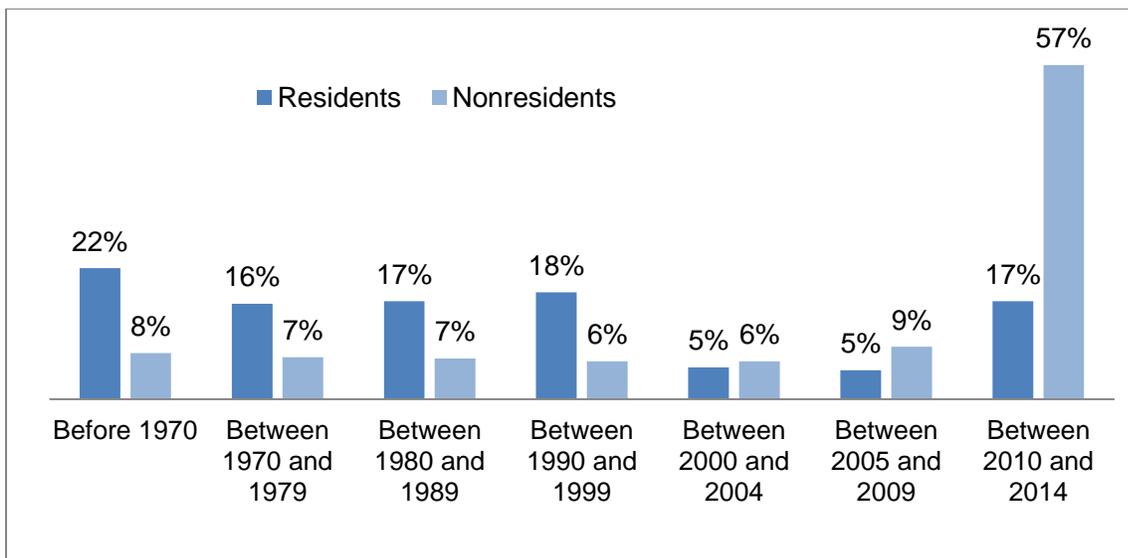


Figure 2. Decade when anglers first began fishing in Maine on a regular basis

Forty seven percent of resident anglers fish in the state every year or every other year (Figure 3).<sup>3</sup> The largest percent of resident and nonresident anglers fish about once every three to five years, 37% and 43% respectively. The results suggest that more than three quarters of resident anglers let their fishing license lapse for a year or more.

<sup>3</sup> The fishing frequency results in Figure 3 are derived from the purchasing histories constructed for each angler using the DIF&W license database. Survey respondents were more avid than Maine's average angler population

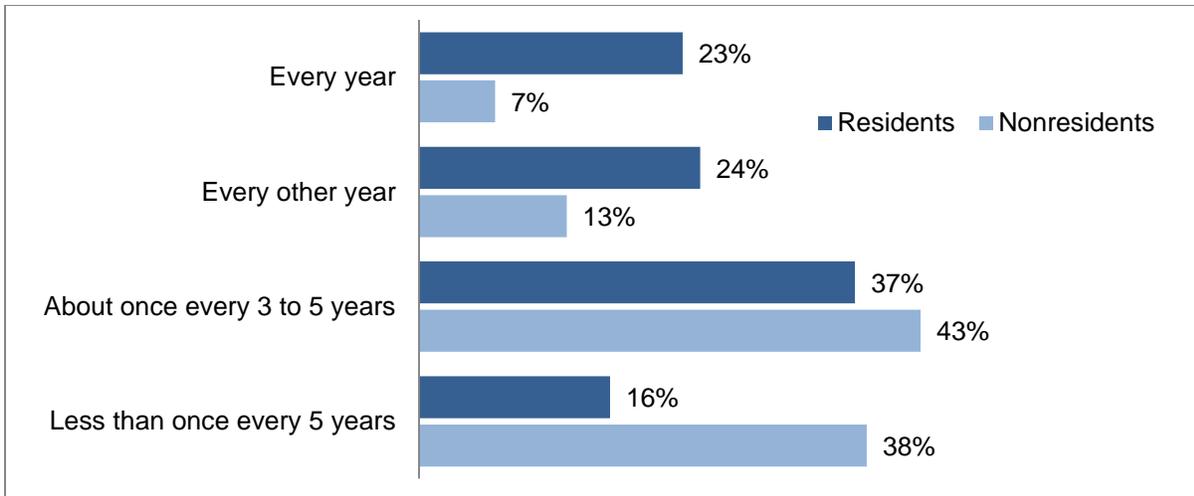


Figure 3. Angling frequency in Maine

Maine offers a variety of fishing opportunities to residents and visitors throughout the state where anglers are able to pursue a variety of different species of freshwater and saltwater game fish. Ninety six percent of resident and nonresident anglers pursue freshwater species (Figure 4). One quarter of Maine residents and 9% of nonresidents pursue saltwater species.

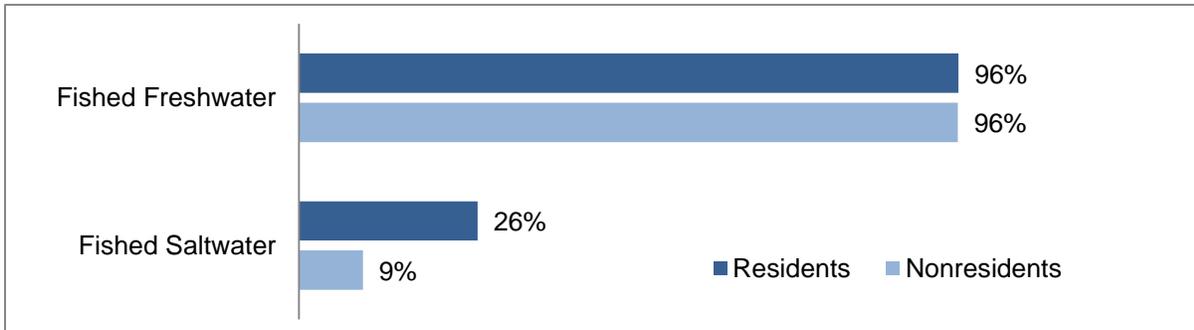


Figure 4. Freshwater or saltwater fishing among Maine’s anglers.

Among those anglers pursuing freshwater fish, 95% or more of residents and nonresidents fished in open waters (Figure 5). Thirty six percent of resident anglers also ice fished. While only 6% of nonresidents went ice fishing.

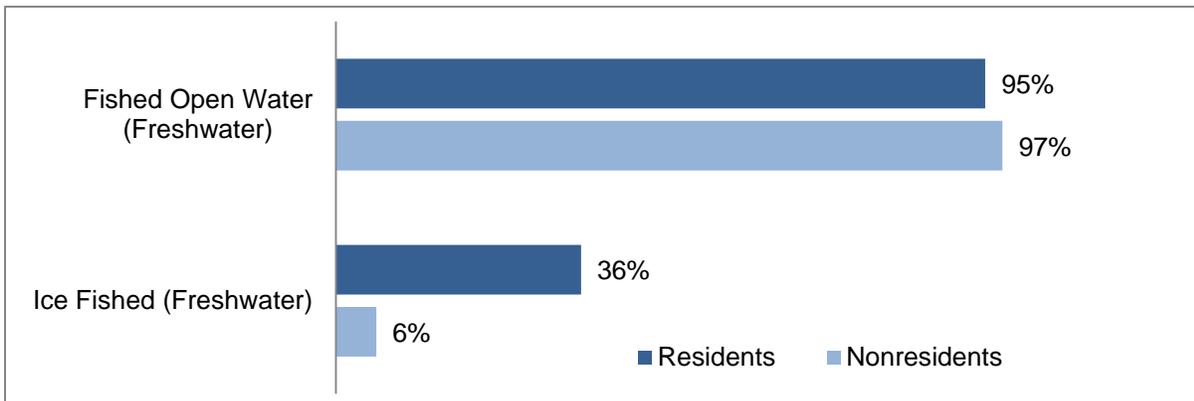


Figure 5. Open water or ice fishing among freshwater anglers

Brook trout, smallmouth bass, and landlocked salmon are the three most commonly pursued species among both resident and nonresident anglers who freshwater fish on open water (Table 3). Thirty one percent of resident anglers report that they pursue “any species” when fishing open water. Only 7% of nonresident anglers who fish open water indicate that they pursue “any species”, and as a result are more likely than resident anglers to be targeting specific species while fishing.

Resident anglers who ice fish most commonly fish for lake trout, brook trout, or landlocked salmon. Nonresident anglers who ice fish most commonly fish for lake trout, brown trout, and brook trout. Roughly one quarter to one third of all anglers who ice fish share they don’t fish for any one particular species.

Table 3. Freshwater species pursued by residency and water type.

Species Pursued	Open water fishing in freshwater		Ice fishing	
	Residents	Nonresidents	Residents	Nonresidents
Brook trout	<b>60%</b>	<b>47%</b>	<b>49%</b>	<b>27%</b>
Smallmouth bass	<b>44%</b>	<b>47%</b>	19%	15%
Landlocked salmon	<b>35%</b>	<b>38%</b>	<b>38%</b>	22%
Largemouth bass	34%	35%	22%	24%
Anything	31%	7%	<b>38%</b>	23%
Lake trout (togue)	28%	17%	<b>52%</b>	<b>43%</b>
Brown trout	27%	24%	32%	<b>27%</b>
Rainbow trout	24%	23%	20%	19%
White perch	16%	7%	17%	8%
Pickereel	14%	12%	18%	17%
Yellow perch	8%	4%	10%	9%
Northern pike	6%	7%	17%	17%
Black crappie	5%	1%	5%	3%
Splake	4%	1%	9%	1%
Smelt	3%	0%	8%	3%
Hornpout	3%	1%	1%	1%
Muskellunge	2%	3%	0%	1%
Other	2%	2%	1%	7%
Cusk	2%	0%	14%	12%
Arctic charr (blueback trout)	1%	3%	1%	4%
Whitefish	1%	1%	5%	6%

\* Table is sorted base on open water resident species pursued. Values in bold reflect the top three species pursued by residents and nonresidents by water type.

**NOTE: The remainder of this report focuses on only those anglers who report fishing in freshwater.**

*Purpose, destination, and duration of fishing trip*

A freshwater fishing trip can be for one day in which the angler leaves home and returns the same day, or it can be a multi-day trip including an overnight stay away from home. The differences are generally associated with the anglers' place of residence (in-state or out-of-state) and type of water where anglers fish.

Single-day trips: In general, residents are more likely to take a one-day fishing trip compared to nonresident anglers. For example, 85% of resident anglers who go freshwater fishing on open water take one-day fishing trips (Table 4). While, only 10% of nonresident anglers who went freshwater fishing on an open body of water took a one-day trip.

Table 4. Freshwater anglers who took a one-day trip in 2013 where the primary purpose was to fish.

	Resident anglers	Nonresident anglers
Open water fishing	85%	10%
Ice fishing	89%	28%

The regional distribution of fishing trips, especially one-day trips, is a function of where resident anglers live and where the major waterways are located. Maine's Lakes and Mountains followed by The Kennebec Valley and The Maine Highlands regions are the locations where the largest proportions of one-day freshwater fishing trips occur among resident anglers (Table 5).

Among nonresidents, Maine's Lakes and Mountains and The Maine Beaches regions are the locations where the largest proportions of one-day fresh water fishing trips occur (Table 5).

Table 5. One-day trips taken by anglers in 2013 by species and region as a proportion of statewide total.

	Open water fishing in freshwater	Ice fishing
<u>Residents</u>		
Aroostook County	7%	8%
Downeast & Acadia	8%	8%
Greater Portland & Casco Bay	8%	7%
The Kennebec Valley	18%	22%
Maine's Lakes & Mountains	20%	19%
Mid Coast	10%	10%
The Maine Beaches	13%	10%
The Maine Highlands	17%	15%
<i>State Total</i>	<i>100%</i>	<i>100%</i>

Table 5 (cont.). One-day trips taken by anglers in 2013 by species and region as a proportion of statewide total.

	Open water fishing in freshwater	Ice fishing
<b>Nonresidents</b>		
Aroostook County	11%	11%
Downeast & Acadia	5%	3%
Greater Portland & Casco Bay	3%	8%
The Kennebec Valley	12%	6%
Maine's Lakes & Mountains	35%	34%
Mid Coast	5%	5%
The Maine Beaches	19%	28%
The Maine Highlands	11%	5%
<i>State Total</i>	<i>100%</i>	<i>100%</i>

Multiple-day trips: Many freshwater anglers take overnight trips to go fishing over multiple days. In general, nonresidents are more likely to make overnight trips compared to residents. Eighty-eight percent of nonresident anglers who fish open water make it an overnight trip (Table 6). Seventy eight percent of nonresident anglers who ice fish take an overnight trip compared to 37% of residents.

Table 6. Anglers who took a multi-day trip in 2013 where the primary purpose was to fish

	Resident anglers	Nonresident anglers
Open water fishing	55%	88%
Ice fishing	37%	78%

The Maine Highlands and Maine's Lakes and Mountains regions are the locations with the largest proportion of overnight open water and ice fishing trips occur among resident anglers. Aroostook County is also one of the more popular regions to go ice fishing among resident anglers. Among nonresidents, the results are very similar. The Maine's Lakes and Mountains and The Maine Highlands regions are the locations where the greatest percent of nonresident open water and ice fishing trips occur (Table 7).

Table 7. Overnight trips taken by anglers in 2013 by species and region as a proportion of statewide total.

	Open water fishing in freshwater	Ice fishing
<u>Residents</u>		
Aroostook County	9%	16%
Downeast & Acadia	8%	7%
Greater Portland & Casco Bay	2%	4%
The Kennebec Valley	15%	13%
Maine's Lakes & Mountains	20%	16%
Mid Coast	5%	3%
The Maine Beaches	12%	13%
The Maine Highlands	28%	28%
<i>State Total</i>	<i>100%</i>	<i>100%</i>
<u>Nonresidents</u>		
Aroostook County	8%	14%
Downeast & Acadia	9%	5%
Greater Portland & Casco Bay	3%	6%
The Kennebec Valley	16%	14%
Maine's Lakes & Mountains	26%	24%
Mid Coast	3%	2%
The Maine Beaches	5%	12%
The Maine Highlands	30%	22%
<i>State Total</i>	<i>100%</i>	<i>100%</i>

For those anglers who do take part in a multi-day freshwater fishing trip that involves an overnight away from home, Table 8 shows the types of accommodations utilized by residents and nonresidents. Regardless of the region visited, the primary overnight accommodation for residents is a relative's or associate's lodging. For nonresidents visiting Aroostook County, the most commonly utilized accommodation is a sporting or wilderness camp or lodge. The greatest percent of nonresident anglers visiting southern and western Maine stay at a relative or associate's lodging. Nonresident anglers visiting areas more centrally located in Maine (The Kennebec Valley, The Maine Highlands, and Downeast and Acadia) most commonly stay at a rented lodge or campground/RV park. The proportion of overnight-respondents who indicate that they utilize one form of unpaid accommodations (owned, lodging, relatives lodging, free campground, or other) relative to the proportion who utilize paid accommodations is noteworthy. Determining the degree to which this is comparable to the general overnight traveler is beyond the scope of this report. However, these findings present valuable information for future direct marketing campaigns.

Table 8. Accommodation type used by overnight anglers, by region and residency

	Aroostook County	Downeast & Acadia	Greater Portland & Casco Bay	The Kennebec Valley	Maine's Lakes & Mountains	Mid Coast	The Maine Beaches	The Maine Highlands
<b>Residents</b>								
<i>Paid accommodations</i>								
Hotel, motel, resort	6%	3%	6%	4%	4%	9%	3%	6%
Inn or bed and breakfast	6%	5%	0%	0%	1%	2%	1%	2%
Rented lodging**	24%	26%	6%	13%	21%	18%	19%	24%
Campground or RV park	5%	5%	9%	11%	20%	14%	8%	14%
Sporting or wilderness camp or lodge	12%	14%	2%	7%	8%	2%	1%	12%
Other paid accommodation	1%	0%	1%	1%	1%	0%	2%	1%
<i>Unpaid accommodations</i>								
Lodging owned by respondent**	18%	15%	18%	11%	14%	11%	14%	11%
Relative or associate's lodging**	29%	25%	28%	25%	26%	37%	48%	27%
A free campground or campsite	7%	15%	7%	38%	11%	7%	8%	12%
Other unpaid accommodation	4%	6%	60%	9%	12%	18%	16%	6%
<b>Nonresidents</b>								
<i>Paid accommodations</i>								
Hotel, motel, resort	9%	12%	14%	9%	12%	12%	5%	7%
Inn or bed and breakfast	5%	5%	0%	3%	0%	0%	0%	1%
Rented lodging**	17%	23%	23%	36%	20%	36%	30%	23%
Campground or RV park	7%	12%	8%	17%	17%	5%	5%	28%
Sporting or wilderness camp or lodge	38%	21%	1%	16%	21%	1%	0%	19%
Other paid accommodation	0%	0%	0%	0%	0%	0%	1%	0%
<i>Unpaid accommodations</i>								
Lodging owned by respondent*	3%	7%	3%	5%	6%	8%	6%	3%
Relative or associate's lodging**	24%	19%	59%	17%	26%	41%	54%	18%
A free campground or campsite	10%	4%	0%	3%	2%	0%	1%	7%
Other unpaid accommodation	2%	8%	3%	1%	2%	1%	2%	1%

Note: Total is greater than 100% since some respondents reported staying at more than one type of lodging.

\* Includes cabin, cottage, condo, and vacation home.

\*\*Proportion is an imprecise estimate of the actual number of anglers given the low number of responses in this category.

Residents typically take one month or less to plan for a freshwater fishing trip (Table 9). Nonresidents can take anywhere between one month to one year to plan for a fishing trip. The planning duration for nonresidents appears to be somewhat influenced by the type of water where fishing will occur. Ice fishing trips, in general, have a slightly shorter planning period relative to open water fishing trips.

Table 9. Advance planning timeframe for overnight fishing trips.

	Open water fishing in freshwater	Ice fishing
<u>Residents</u>		
Less than a week	48%	51%
2 to 4 weeks	35%	27%
1 to 6 months	15%	16%
6 to 12 months	2%	5%
More than a year	0%	1%
<i>Total</i>	<i>100%</i>	<i>100%</i>
<u>Nonresidents</u>		
Less than a week	13%	5%
2 to 4 weeks	37%	16%
1 to 6 months	34%	53%
6 to 12 months	13%	24%
More than a year	2%	2%
<i>Total</i>	<i>100%</i>	<i>100%</i>

### *Angler spending*

In broad terms, the expenditure questions in the survey mirror the categories included in the U.S. Fish and Wildlife Service's *National Survey of Fishing, Hunting and Wildlife-Associated Recreation*. Trip-related spending includes primarily consumables such as fuel, food, and lodging. Fishing equipment includes special-purpose items such as rods, reels, line, lures, tackle box, and depth finders. Auxiliary, special, and other equipment includes purchases for clothing, ATVs, campers or camping equipment, vehicles, and property purchased specifically for the purpose of fishing. In the case of special equipment (vehicles, property, etc.), respondents were asked to report the percentage for which the item is used specifically for fishing purposes.

Anglers, on average, spend \$1,154 per year on items purchased to take a trip where the primary purpose is freshwater fishing (Table 10). Open water anglers collectively spend an average of \$1,013 per year. Anglers going ice fishing collectively spend an average of \$806 per year. In general, nonresidents spend more on travel related items, particularly to fish on open water, and less on special equipment.

Table 10. Average annual spending per angler by water type in 2013

	Resident	Nonresident	All anglers
<b>All freshwater fishing*</b>			
Trip expenditures	\$463	\$736	\$516
Fishing equipment	\$247	\$220	\$242
Auxiliary, special, and other equipment	\$467	\$87	\$395
Total	\$1,177	\$1,043	\$1,154
<b>Open water fishing</b>			
Trip expenditures	\$407	\$780	\$480
Fishing equipment	\$205	\$238	\$212
Auxiliary, special, and other equipment	\$381	\$76	\$321
Total	\$993	\$1,094	\$1,013
<b>Ice fishing</b>			
Trip expenditures	\$285	\$359	\$289
Fishing equipment	\$179	\$60	\$172
Auxiliary, special, and other equipment	\$354	\$197	\$345
Total	\$818	\$617	\$806

\*Average spending for all freshwater fishing includes individual anglers who participate in both open water and ice fishing and the respective expenditures on both types of fishing.

Table 11 shows total direct retail spending at the statewide level across all anglers and by water type for resident and nonresident anglers where the primary purpose of the trip was to fish. Total spending by all anglers regardless of water type is estimated at \$208.8 million per year.<sup>4</sup> Freshwater anglers fishing on open water spend a total of \$160.5 million per year and anglers who go ice fishing spend a total of \$48.3 million per year.

Table 11. Total spending among Maine anglers by water type in 2013

	Resident	Nonresident	Total
<b>All freshwater fishing</b>			
Trip expenditures	\$68,861,156	\$23,888,041	\$92,749,197
Fishing equipment	\$36,695,903	\$7,147,096	\$43,842,999
Auxiliary, special, and other equipment	\$69,396,435	\$2,819,397	\$72,215,832
Total	\$174,953,494	\$33,854,533	\$208,808,028
<b>Open water fishing</b>			
Trip expenditures	\$52,687,787	\$22,783,509	\$75,471,297
Fishing equipment	\$26,552,028	\$6,963,973	\$33,516,001
Auxiliary, special, and other equipment	\$49,328,641	\$2,212,610	\$51,541,252
Total	\$128,568,456	\$31,960,093	\$160,528,549
<b>Ice fishing</b>			
Trip expenditures	\$16,173,369	\$1,104,531	\$17,277,901
Fishing equipment	\$10,143,875	\$183,123	\$10,326,998
Auxiliary, special, and other equipment	\$20,067,794	\$606,786	\$20,674,580
Total	\$46,385,038	\$1,894,441	\$48,279,479

<sup>4</sup> This estimate includes only spending when the primary purpose of the trip was fishing.

Respondents were asked to report the tourism region in which their spending occurred (see Figure 1 for location of each region). Spending associated with all aspects of fishing occur both close to home and close to the destination, regardless of the water type. As a result, retail expenditures impact the economy of all tourism regions, even in those areas where relatively little fishing activity is likely to take place. For example, the Greater Portland & Casco Bay Area experiences \$17.9 million of angler spending due to its large total population base and spending (primarily equipment) that occurs close to home (Table 12). Detailed expenditure tables for both residents and nonresidents cross-tabulated by both water type and tourism region are provided in Appendix A.

Table 12. Resident and nonresident total annual spending in 2013-statewide and by destination county

Region	Open water fishing	Ice fishing	All freshwater fishing
Statewide	\$160,528,549	\$48,279,479	\$208,808,028
Aroostook County	\$10,686,768	\$4,387,361	\$15,074,129
Downeast & Acadia	\$11,359,157	\$6,219,742	\$17,578,899
Greater Portland & Casco Bay	\$13,836,304	\$4,085,195	\$17,921,498
The Kennebec Valley	\$28,648,879	\$7,910,845	\$36,559,724
Maine's Lakes & Mountains	\$30,190,620	\$6,686,564	\$36,877,184
Mid Coast	\$15,581,147	\$5,992,050	\$21,573,197
The Maine Beaches	\$19,502,831	\$4,759,968	\$24,262,799
The Maine Highlands	\$30,722,843	\$8,237,754	\$38,960,597

*Economic contributions associated with angler spending*

Tables 13, 14, and 15 show the economic contribution of total direct spending for resident and nonresident freshwater anglers by water type. Detailed economic contribution tables for both residents and nonresidents cross-tabulated by both water type and tourism region are provided in Appendix A.

A brief discussion of the results below focuses on Table 15 which shows the economic contributions of spending by all anglers for open water and ice fishing. Interpretations of the economic contributions associated with resident and nonresident are similar when using their individual tables, Table 13 and Table 14, respectively.

Collectively, spending by sportsmen who fish in Maine supports more than 3,300 full- and part-time jobs in the state, providing \$104.8 million in labor income (Table 15). Anglers' purchases contribute \$176.0 million to the gross state product and generate total economic activity of \$319.2 million.

Table 13. **Resident** angler economic contributions in 2013 by water type

	Economic Contribution		
	Direct Effect	Multiplier Effect	Total Effect
<b>All freshwater fishing</b>			
Employment	1,846	887	2,733
Labor Income	\$51,395,772	\$35,077,871	\$86,473,643
Value added (State GDP)	\$86,172,616	\$59,560,030	\$145,732,646
Total output	\$163,800,544	\$100,627,087	\$264,427,631
<b>Open freshwater fishing</b>			
Employment	1,322	655	1,977
Labor Income	\$38,272,705	\$25,981,614	\$64,254,320
Value added (State GDP)	\$61,726,777	\$44,102,191	\$105,828,968
Total output	\$119,228,085	\$74,486,208	\$193,714,293
<b>Ice fishing</b>			
Employment	525	231	756
Labor Income	\$13,123,066	\$9,096,257	\$22,219,323
Value added (State GDP)	\$24,445,839	\$15,457,839	\$39,903,678
Total output	\$44,572,458	\$26,140,880	\$70,713,338

Table 14. **Nonresident** angler economic contributions in 2013 by water type

	Economic Contribution		
	Direct Effect	Multiplier Effect	Total Effect
<b>All freshwater fishing</b>			
Employment	403	194	597
Labor Income	\$10,632,353	\$7,686,020	\$18,318,373
Value added (State GDP)	\$17,311,141	\$12,910,690	\$30,221,832
Total output	\$32,922,978	\$21,827,727	\$54,750,704
<b>Open freshwater fishing</b>			
Employment	380	185	565
Labor Income	\$10,086,637	\$7,310,231	\$17,396,868
Value added (State GDP)	\$16,281,616	\$12,275,580	\$28,557,197
Total output	\$31,089,483	\$20,751,808	\$51,841,291
<b>Ice fishing</b>			
Employment	22	9	32
Labor Income	\$545,716	\$375,789	\$921,505
Value added (State GDP)	\$1,029,525	\$635,110	\$1,664,635
Total output	\$1,833,495	\$1,075,918	\$2,909,413

Table 15. **All** angler economic contributions in 2013 by water type

	Economic Contribution		
	Direct Effect	Multiplier Effect	Total Effect
<b>All freshwater fishing</b>			
Employment	2,249	1,081	3,330
Labor Income	\$62,028,125	\$42,763,891	\$104,792,016
Value added (State GDP)	\$103,483,758	\$72,470,720	\$175,954,478
Total output	\$196,723,521	\$122,454,814	\$319,178,335
<b>Open freshwater fishing</b>			
Employment	1,702	840	2,542
Labor Income	\$48,359,343	\$33,291,845	\$81,651,188
Value added (State GDP)	\$78,008,393	\$56,377,771	\$134,386,165
Total output	\$150,317,568	\$95,238,016	\$245,555,584
<b>Ice fishing</b>			
Employment	547	241	788
Labor Income	\$13,668,782	\$9,472,046	\$23,140,828
Value added (State GDP)	\$25,475,364	\$16,092,949	\$41,568,313
Total output	\$46,405,953	\$27,216,798	\$73,622,751

## Summary

One of the goals of this study was to provide insight about jobs, labor income and other economic contributions that result from recreational freshwater angling that occurs in Maine at a statewide and tourism region level. Maine's fishery resources draw thousands of resident and non-resident sportsmen to take a trip to fish every year (Table 16).

Maine's resident angler population is a blend of anglers who have been fishing since before 1970 to newer anglers just starting within the last five years. Resident anglers typically go fishing every year or every other year. The majority, 56%, of nonresident anglers first began fishing in Maine on a regular basis within the last decade. And, they are most likely to go fishing every three to five years.

Table 16. Participation and spending by Maine's anglers 2013

Activity	Anglers		Total Annual Spending	
	Resident	Nonresident	Resident	Nonresident
All freshwater anglers*	188,126	70,648	\$174,953,494	\$33,854,533
Open freshwater anglers	171,209	66,197	\$128,568,456	\$31,960,093
Ice water anglers	64,432	4,043	\$46,385,038	\$1,894,441

\* Reflects the proportion of license holders with the privilege to fish from the Maine DIF&W based upon survey results.

Anglers spend \$208.8 million on fishing-related activities. The spending associated with these activities leads to significant economic contributions to the Maine economy. Included in this spending are expenditures on trip-related items such as meals, fuel, and lodging. Resident

anglers are more likely than nonresident anglers to take a day trip to go fishing, whereas, nonresidents are more likely to take an overnight trip to go fishing. A notable proportion of all anglers who do take an overnight trip utilize unpaid accommodation, such as a relative's or associate's lodging.

Collectively, recreational freshwater fishing supports more than 3,300 full- and part-time jobs (2,733 associated with resident spending and 597 associated with nonresident spending) providing more than \$104 million in labor income (Table 17). The direct spending by sportsmen who freshwater fish and multiplier effects of that spending in Maine contribute \$176.0 million (\$145.7 million associated with resident spending and \$30.2 associated with nonresident spending) to the state's gross domestic product and a total economic contribution of \$319.2 million.

Table 17. Total economic effects of fishing on Maine's economy in 2013

	Employment	Labor Income	Value Added (State GDP)	Total Output
<u>Residents</u>				
All freshwater anglers	2,733	\$86,473,643	\$145,732,646	\$264,427,631
Open freshwater anglers	1,977	\$64,254,320	\$105,828,968	\$193,714,293
Ice water anglers	756	\$22,219,323	\$39,903,678	\$70,713,338
<u>Nonresidents</u>				
All freshwater anglers	597	\$18,318,373	\$30,221,832	\$54,750,704
Open freshwater anglers	565	\$17,396,868	\$28,557,197	\$51,841,291
Ice water anglers	32	\$921,505	\$1,664,635	\$2,909,413

The study shows that the economic contributions of sportsmen occur across the eight travel regions within the state. The difference stems, in large part, from the opportunities to fish within a region's boundary. However, it is important to remember that spending associated with sportsmen's activities occurs both close to home and close to their fishing destination. As a result, economic contributions are felt from fishing activities, regardless of water type, all across the state.

## **Appendices**

Appendix A: Angling by tourism region

Appendix B: Methodology for estimating economic contributions

Appendix C: Explanation of economic contribution

Appendix D: Angler spending profiles by water type

## **Appendix A: Angling by water type and by tourism region**

*Appendix A presents detailed economic measures (participation, spending and economic contributions by activity) for each of the tourism regions.*

Table A 1. Total annual spending in 2013 by **resident** anglers by water type and region

Region	Aroostook County	Downeast & Acadia	Greater Portland & Casco Bay	The Kennebec Valley	Maine's Lakes & Mountains	Mid Coast	The Maine Beaches	The Maine Highlands
All freshwater anglers								
Trip Expenditure	\$5,910,186	\$5,154,112	\$3,979,304	\$15,756,482	\$13,824,849	\$5,344,575	\$5,910,186	\$5,154,112
Fishing equipment	\$2,476,702	\$2,197,295	\$5,323,073	\$5,337,653	\$6,965,936	\$4,038,697	\$2,476,702	\$2,197,295
Auxiliary, special and other equipment	\$2,163,650	\$6,737,078	\$7,300,766	\$10,370,323	\$8,501,161	\$11,144,037	\$2,163,650	\$6,737,078
Total Fishing Expenditure	\$10,550,538	\$14,088,485	\$16,603,143	\$31,464,458	\$29,291,946	\$20,527,308	\$10,550,538	\$14,088,485
Open water anglers								
Trip Expenditure	\$4,033,406	\$3,676,204	\$3,330,554	\$13,319,592	\$10,667,329	\$4,192,573	\$4,485,997	\$8,982,133
Fishing equipment	\$1,571,526	\$1,593,076	\$3,657,371	\$3,643,035	\$5,088,254	\$3,080,485	\$4,199,092	\$3,719,190
Auxiliary, special and other equipment	\$1,010,034	\$2,750,693	\$5,669,058	\$6,802,629	\$7,159,334	\$7,306,967	\$7,907,374	\$10,722,552
Total Fishing Expenditure	\$6,614,966	\$8,019,973	\$12,656,984	\$23,765,255	\$22,914,916	\$14,580,024	\$16,592,463	\$23,423,875
Ice water anglers								
Trip Expenditure	\$1,876,780	\$1,477,909	\$648,750	\$2,436,890	\$3,157,521	\$1,152,002	\$1,514,826	\$3,908,693
Fishing equipment	\$905,176	\$604,218	\$1,665,701	\$1,694,618	\$1,877,682	\$958,213	\$1,043,554	\$1,394,712
Auxiliary, special and other equipment	\$1,153,616	\$3,986,386	\$1,631,708	\$3,567,694	\$1,341,827	\$3,837,069	\$1,948,340	\$2,601,154
Total Fishing Expenditure	\$3,935,572	\$6,068,513	\$3,946,159	\$7,699,203	\$6,377,030	\$5,947,284	\$4,506,719	\$7,904,559

Table A 2. Total annual spending in 2013 for **nonresident** anglers by water type and region

Region	Aroostook County	Downeast & Acadia	Greater Portland & Casco Bay	The Kennebec Valley	Maine's Lakes & Mountains	Mid Coast	The Maine Beaches	The Maine Highlands
All freshwater anglers								
Trip Expenditure	\$3,390,998	\$2,600,204	\$877,560	\$3,894,803	\$5,248,797	\$776,628	\$1,959,013	\$5,140,038
Fishing equipment	\$818,030	\$559,558	\$308,867	\$966,486	\$1,551,874	\$198,390	\$724,849	\$2,019,041
Auxiliary, special and other equipment	\$314,563	\$330,651	\$131,929	\$233,977	\$784,567	\$70,870	\$479,754	\$473,084
Total Fishing Expenditure	\$4,523,591	\$3,490,413	\$1,318,355	\$5,095,266	\$7,585,238	\$1,045,889	\$3,163,617	\$7,632,163
Open water anglers								
Trip Expenditure	\$3,085,970	\$2,556,476	\$785,531	\$3,790,354	\$5,077,640	\$741,199	\$1,839,475	\$4,906,864
Fishing equipment	\$765,748	\$555,478	\$300,394	\$951,118	\$1,527,658	\$191,425	\$682,295	\$1,989,857
Auxiliary, special and other equipment	\$220,084	\$227,230	\$93,395	\$142,152	\$670,406	\$68,499	\$388,598	\$402,247
Total Fishing Expenditure	\$4,071,802	\$3,339,184	\$1,179,320	\$4,883,624	\$7,275,704	\$1,001,123	\$2,910,368	\$7,298,968
Ice water anglers								
Trip Expenditure	\$305,028	\$43,727	\$92,029	\$104,449	\$171,157	\$35,429	\$119,539	\$233,174
Fishing equipment	\$52,282	\$4,080	\$8,472	\$15,368	\$24,216	\$6,965	\$42,554	\$29,184
Auxiliary, special and other equipment	\$94,479	\$103,422	\$38,534	\$91,825	\$114,161	\$2,372	\$91,156	\$70,837
Total Fishing Expenditure	\$451,789	\$151,229	\$139,036	\$211,642	\$309,534	\$44,766	\$253,249	\$333,196

Table A 3. Total annual spending in 2013 for **all** anglers by water type and region

Region	Aroostook County	Downeast & Acadia	Greater Portland & Casco Bay	The Kennebec Valley	Maine's Lakes & Mountains	Mid Coast	The Maine Beaches	The Maine Highlands
All freshwater anglers								
Trip Expenditure	\$9,301,184	\$7,754,316	\$4,856,864	\$19,651,284	\$19,073,646	\$6,121,202	\$7,959,836	\$18,030,864
Fishing equipment	\$3,294,732	\$2,756,853	\$5,631,939	\$6,304,139	\$8,517,809	\$4,237,088	\$5,967,495	\$7,132,943
Auxiliary, special and other equipment	\$2,478,214	\$7,067,730	\$7,432,695	\$10,604,301	\$9,285,728	\$11,214,907	\$10,335,468	\$13,796,790
Total Fishing Expenditure	\$15,074,129	\$17,578,899	\$17,921,498	\$36,559,724	\$36,877,184	\$21,573,197	\$24,262,799	\$38,960,597
Open water anglers								
Trip Expenditure	\$7,119,376	\$6,232,680	\$4,116,085	\$17,109,946	\$15,744,969	\$4,933,772	\$6,325,472	\$13,888,997
Fishing equipment	\$2,337,273	\$2,148,555	\$3,957,766	\$4,594,152	\$6,615,911	\$3,271,910	\$4,881,387	\$5,709,046
Auxiliary, special and other equipment	\$1,230,118	\$2,977,922	\$5,762,453	\$6,944,781	\$7,829,740	\$7,375,466	\$8,295,972	\$11,124,799
Total Fishing Expenditure	\$10,686,768	\$11,359,157	\$13,836,304	\$28,648,879	\$30,190,620	\$15,581,147	\$19,502,831	\$30,722,843
Ice water anglers								
Trip Expenditure	\$2,181,808	\$1,521,636	\$740,779	\$2,541,339	\$3,328,678	\$1,187,431	\$1,634,364	\$4,141,867
Fishing equipment	\$957,458	\$608,298	\$1,674,174	\$1,709,987	\$1,901,898	\$965,178	\$1,086,108	\$1,423,897
Auxiliary, special and other equipment	\$1,248,095	\$4,089,807	\$1,670,242	\$3,659,519	\$1,455,988	\$3,839,441	\$2,039,496	\$2,671,991
Total Fishing Expenditure	\$4,387,361	\$6,219,742	\$4,085,195	\$7,910,845	\$6,686,564	\$5,992,050	\$4,759,968	\$8,237,754

Table A 4. Total economic contributions in 2013 for **resident** anglers by water type and region

Region	Aroostook County	Downeast & Acadia	Greater Portland & Casco Bay	The Kennebec Valley	Maine's Lakes & Mountains	Mid Coast	The Maine Beaches	The Maine Highlands
All freshwater angling								
Employment	165	220	259	491	458	321	330	489
Labor Income	\$5,214,777	\$6,963,466	\$8,206,377	\$15,551,826	\$14,478,026	\$10,145,960	\$10,428,618	\$15,484,594
Value Added (State GDP)	\$8,788,380	\$11,735,417	\$13,830,075	\$26,209,243	\$24,399,585	\$17,098,824	\$17,575,183	\$26,095,938
Total Output	\$15,946,259	\$21,293,572	\$25,094,267	\$47,555,907	\$44,272,335	\$31,025,317	\$31,889,656	\$47,350,318
Open water angling								
Employment	102	123	195	365	352	224	255	360
Labor Income	\$3,305,944	\$4,008,121	\$6,325,548	\$11,877,099	\$11,452,127	\$7,286,620	\$8,292,372	\$11,706,489
Value Added (State GDP)	\$5,444,998	\$6,601,506	\$10,418,384	\$19,561,971	\$18,862,029	\$12,001,303	\$13,657,808	\$19,280,970
Total Output	\$9,966,779	\$12,083,706	\$19,070,297	\$35,807,147	\$34,525,939	\$21,967,745	\$24,999,890	\$35,292,789
Ice water angling								
Employment	64	99	64	125	104	97	73	129
Labor Income	\$1,885,215	\$2,906,934	\$1,890,286	\$3,688,066	\$3,054,720	\$2,848,863	\$2,158,805	\$3,786,435
Value Added (State GDP)	\$3,385,657	\$5,220,562	\$3,394,764	\$6,623,396	\$5,485,970	\$5,116,273	\$3,876,997	\$6,800,058
Total Output	\$5,999,725	\$9,251,362	\$6,015,864	\$11,737,326	\$9,721,692	\$9,066,551	\$6,870,430	\$12,050,388

Table A 5. Total economic contributions in 2013 for **nonresident** anglers by water type and region

Region	Aroostook County	Downeast & Acadia	Greater Portland & Casco Bay	The Kennebec Valley	Maine's Lakes & Mountains	Mid Coast	The Maine Beaches	The Maine Highlands
All freshwater angling								
Employment	80	62	23	90	134	18	56	135
Labor Income	\$2,447,673	\$1,888,630.30	\$713,350	\$2,757,001	\$4,104,302	\$565,921	\$1,711,804	\$4,129,693
Value Added (State GDP)	\$4,038,195	\$3,115,881	\$1,176,892	\$4,548,528	\$6,771,317	\$933,661	\$2,824,150	\$6,813,207
Total Output	\$7,315,706	\$5,644,816	\$2,132,089	\$8,240,238	\$12,267,105	\$1,691,447	\$5,116,309	\$12,342,994
Open water angling								
Employment	72	59	21	86	129	18	51	129
Labor Income	\$2,216,408	\$1,817,621.51	\$641,940	\$2,658,308	\$3,960,391	\$544,942	\$1,584,203	\$3,973,054
Value Added (State GDP)	\$3,638,264	\$2,983,650	\$1,053,754	\$4,363,648	\$6,501,036	\$894,530	\$2,600,492	\$6,521,823
Total Output	\$6,604,721	\$5,416,368	\$1,912,931	\$7,921,547	\$11,801,652	\$1,623,884	\$4,720,801	\$11,839,387
Ice water angling								
Employment	8	3	2	4	5	1	4	6
Labor Income	\$219,762	\$73,561.73	\$67,631	\$102,948	\$150,565	\$21,775	\$123,187	\$162,075
Value Added (State GDP)	\$396,985	\$132,884	\$122,170	\$185,969	\$271,986	\$39,336	\$222,528	\$292,777
Total Output	\$693,841	\$232,252	\$213,526	\$325,032	\$475,371	\$68,750	\$388,930	\$511,710

Table A 6. Total economic contributions in 2013 for **all** anglers by water type and region

<b>Region</b>	Aroostook County	Downeast & Acadia	Greater Portland & Casco Bay	The Kennebec Valley	Maine's Lakes & Mountains	Mid Coast	The Maine Beaches	The Maine Highlands
All freshwater angling								
Employment	245	282	283	581	591	339	385	624
Labor Income	\$7,662,450	\$8,852,096	\$8,919,726	\$18,308,827	\$18,582,328	\$10,711,881	\$12,140,422	\$19,614,287
Value Added (State GDP)	\$12,826,575	\$14,851,298	\$15,006,967	\$30,757,771	\$31,170,903	\$18,032,485	\$20,399,333	\$32,909,146
Total Output	\$23,261,965	\$26,938,388	\$27,226,357	\$55,796,144	\$56,539,441	\$32,716,763	\$37,005,965	\$59,693,312
Open water angling								
Employment	174	182	215	452	481	242	307	489
Labor Income	\$5,522,352	\$5,825,742	\$6,967,488	\$14,535,407	\$15,412,518	\$7,831,563	\$9,876,575	\$15,679,543
Value Added (State GDP)	\$9,083,262	\$9,585,157	\$11,472,138	\$23,925,620	\$25,363,065	\$12,895,832	\$16,258,299	\$25,802,793
Total Output	\$16,571,499	\$17,500,074	\$20,983,228	\$43,728,694	\$46,327,591	\$23,591,630	\$29,720,691	\$47,132,176
Ice water angling								
Employment	72	101	67	129	109	98	78	134
Labor Income	\$2,104,977	\$2,980,496	\$1,957,917	\$3,791,014	\$3,205,285	\$2,870,639	\$2,281,992	\$3,948,510
Value Added (State GDP)	\$3,782,641	\$5,353,446	\$3,516,934	\$6,809,365	\$5,757,956	\$5,155,608	\$4,099,526	\$7,092,836
Total Output	\$6,693,566	\$9,483,614	\$6,229,390	\$12,062,358	\$10,197,063	\$9,135,301	\$7,259,360	\$12,562,098

## Appendix B: Methodology for estimating economic contributions

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

- **Direct effects:** These include the jobs, income and tax revenues that are tied directly to the spending by outdoor recreationists without including multiplier effects.
- **Total effects:** These include the jobs, income and tax revenues that are tied directly to the spending by outdoor recreationists plus the jobs, income and tax revenues that result from the multiplier effects of outdoor recreation spending. The multiplier effect occurs when a direct purchase from a business leads to increased demand for goods and services from other businesses along their supply chain. Also included is economic activity associated with household spending of incomes earned in the affected businesses.

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

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

To apply the IMPLAN model, each specific expenditure for outdoor recreation activities was matched to the appropriate industry sector affected by the initial purchase. The spending was estimated with models of the Maine economy, therefore all of the resulting contributions represent salaries and wages, total economic effects, jobs and tax revenues that occur within the state of Maine. Likewise, models based on specific regions or counties represent the economic effects within the selected region or county. The results do not include any economic activity or indirect contributions that leak out of the state, region, or county of interest. As a result of this leakage, economic contributions at the state level are larger than the sum of corresponding regional or county contributions. This occurs because a portion spending in a particular region (or county) leaks to other regions (or counties) within the state, and this within-state leakage is captured in the Maine model.

## Appendix C: Explanation of economic contribution

Estimations of **economic benefits** can be calculated through two types of measures: economic contributions and economic values. An **economic contribution** addresses the business and financial activity resulting from the use of a resource. **Economic value**, on the other hand, is a non-business measure that estimates the value people receive from an activity after subtracting for their costs and expenditures. This concept is also known as consumer surplus.

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

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

This study presents several important measures:

**Retail Sales** – these include expenditures made by outdoor recreationists for equipment, travel expenses and services related to their outdoor activities over the course of the year. These combined initial retail sales represent the “direct output”.

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

**Salaries & Wages** – this figure reports the total salaries and wages paid in all sectors of the economy as a result of the activity under study. These are not just the paychecks of those employees directly serving recreationists or manufacturing their goods, it also includes portions of the paychecks of, for example, the truck driver who delivers food to the restaurants serving recreationists and the accountants who manage the books for companies down the supply chain, etc. This figure is based on the direct, indirect and induced effects, and is essentially a portion of the total economic effect figure reported in this study.

**Jobs** – much like Salaries and Wages, this figure reports the total jobs in all sectors of the economy as a result of the activity under study. These are not just the employees directly serving recreationists or manufacturing their goods, they also include, for example, the truck driver who delivers food to the restaurants serving recreationists and

the accountants who manage the books for companies down the supply chain, etc. This figure is based on direct, indirect and induced effects.

**GDP Contribution** – this represents the total “value added” contribution of economic output made by the industries involved in the production of outdoor recreation goods and services. For a given industry, value added equals the difference between gross output (sales and other income) and intermediate inputs (goods and services imported or purchased from other industries). It represents the contribution to GDP in a given industry for production related to outdoor recreation.

## Appendix D: Angler spending profiles

Table D 1. Per angler spending profile of **all freshwater** anglers

Type of Spending	Resident Anglers	Nonresident Anglers	All Anglers
Commercial transportation (airline, bus, car rental, train)	\$9.43	\$75.36	\$22.05
Other transportation costs (gas or oil for car, truck, boat, ATV, etc.)	\$155.10	\$120.89	\$148.80
Groceries	\$110.03	\$104.02	\$109.10
Restaurants and bars	\$44.20	\$81.19	\$51.33
Lodging (cabin, motel, lodge, rental, campground, etc.)	\$39.59	\$235.38	\$76.99
Equipment rental (canoe, motor boat, etc.)	\$6.00	\$15.62	\$7.85
Fees (highway tolls, land access fees)	\$6.63	\$13.37	\$7.93
Guide fees	\$10.09	\$43.66	\$16.50
Baits, lures, scents	\$44.62	\$21.79	\$40.36
Other day-to-day items (heating/cooking fuel, ice, etc.)	\$37.65	\$24.46	\$35.22
Fishing gear (rods, reels, rod holders, landing nets, depth finder, fish finder, down rigger bait bucket, minnow traps, ice auger, ice house, etc.)	\$131.72	\$157.10	\$136.68
Fishing tackle (lures, lines, leaders, sinkers, tackle box, etc.)	\$67.61	\$23.23	\$59.39
Maps	\$12.95	\$3.28	\$11.20
Repair of fishing equipment	\$5.21	\$7.65	\$5.68
Taxidermy and mounting	\$4.41	\$3.88	\$4.33
Clothing used only for fishing (waders, fishing vest, etc.)	\$20.10	\$17.06	\$19.52
Other equipment related items	\$4.91	\$7.92	\$5.49
Boat, motor, trailer, accessories (MAINE)	\$75.75	\$8.98	\$62.98
ATV, snowmobile (ice only), trailer, accessories (MAINE)	\$69.09	\$6.85	\$57.58
Travel trailer, tent trailer (pop-up), pickup camper, motor home (MAINE)	\$30.86	\$1.62	\$25.27
Vehicle purchased to use for fishing (MAINE)	\$129.99	\$5.12	\$106.33
Recreational property purchase (MAINE)	\$61.00	\$11.56	\$51.89
Recreational property utilities and maintenance (MAINE)	\$14.92	\$30.54	\$17.92
Camping equipment (tent, sleeping bag, stove, compass, etc.) (MAINE)	\$26.10	\$4.76	\$22.07
Binoculars, camera (MAINE)	\$9.67	\$0.48	\$7.94
Other fishing-related equipment (MAINE)	\$49.56	\$16.93	\$43.46
<b>Total</b>	<b>\$1,177.17</b>	<b>\$1,042.69</b>	<b>\$1,153.84</b>

Table D 2. Per angler spending profile of **open water** anglers

Type of Spending	Resident Anglers	Nonresident Anglers	All Anglers
Commercial transportation (airline, bus, car rental, train)	\$6.23	\$76.98	\$20.09
Other transportation costs (gas or oil for car, truck, boat, ATV, etc.)	\$141.34	\$125.99	\$138.33
Groceries	\$93.10	\$108.76	\$96.16
Restaurants and bars	\$39.83	\$84.75	\$48.63
Lodging (cabin, motel, lodge, rental, campground, etc.)	\$37.83	\$258.56	\$81.08
Equipment rental (canoe, motor boat, etc.)	\$5.59	\$17.23	\$7.87
Fees (highway tolls, land access fees)	\$6.29	\$13.88	\$7.78
Guide fees	\$10.28	\$48.06	\$17.68
Baits, lures, scents	\$35.49	\$22.05	\$32.86
Other day-to-day items (heating/cooking fuel, ice, etc.)	\$31.13	\$23.78	\$29.69
Fishing gear (rods, reels, rod holders, landing nets, depth finder, fish finder, down rigger bait bucket, minnow traps, etc.)	\$128.73	\$172.10	\$137.23
Fishing tackle (lures, lines, leaders, sinkers, tackle box, etc.)	\$41.30	\$24.41	\$37.99
Maps	\$2.56	\$2.16	\$2.48
Repair of fishing equipment	\$5.37	\$8.43	\$5.97
Taxidermy and mounting	\$1.60	\$4.22	\$2.12
Clothing used only for fishing (waders, fishing vests, etc.)	\$21.28	\$18.95	\$20.83
Other equipment related items	\$4.32	\$8.15	\$5.07
Boat, motor, trailer, accessories (MAINE)	\$86.98	\$9.98	\$71.90
ATV, trailer, accessories (MAINE)	\$28.02	\$0.58	\$22.64
Travel trailer, tent trailer (pop-up), pickup camper, motor home (MAINE)	\$35.44	\$1.80	\$28.85
Vehicle purchased to use for fishing (MAINE)	\$121.68	\$4.59	\$98.74
Recreational property purchase (MAINE)	\$26.68	\$3.54	\$22.15
Recreational property utilities and maintenance (MAINE)	\$13.75	\$32.57	\$17.44
Camping equipment (tent, sleeping bag, stove, compass, etc.) (MAINE)	\$23.02	\$4.84	\$19.46
Binoculars, camera (MAINE)	\$8.35	\$0.48	\$6.81
Other fishing-related equipment (MAINE)	\$37.22	\$17.38	\$33.33
<b>Total</b>	<b>\$993.39</b>	<b>\$1,094.21</b>	<b>\$1,013.14</b>

Table D 3. Per angler spending profile of **ice fishing** anglers

Type of Spending	Resident Anglers	Nonresident Anglers	All Anglers
Commercial transportation (airline, bus, car rental, train)	\$10.50	\$64.56	\$13.49
Other transportation costs (gas or oil for car, truck, boat, ATV, etc.)	\$83.87	\$79.70	\$83.64
Groceries	\$75.85	\$65.26	\$75.27
Restaurants and bars	\$24.93	\$52.26	\$26.44
Lodging (cabin, motel, lodge, rental, campground, etc.)	\$17.40	\$29.40	\$18.06
Equipment rental (canoe, motor boat, etc.)	\$2.97	\$1.37	\$2.88
Fees (highway tolls, land access fees)	\$3.02	\$9.34	\$3.37
Guide fees	\$2.99	\$4.54	\$3.07
Baits, lures, scents	\$35.92	\$20.59	\$35.07
Other day-to-day items (heating/cooking fuel, ice, etc.)	\$27.61	\$32.47	\$27.88
Fishing gear (rods, reels, rod holders, landing nets, fish finder, bait bucket, ice auger, ice house, etc.)	\$51.39	\$24.06	\$49.88
Fishing tackle (lures, lines, leaders, sinkers, tackles box, etc.)	\$82.90	\$13.48	\$79.07
Maps	\$28.09	\$14.20	\$27.33
Repair of fishing equipment	\$1.41	\$0.71	\$1.37
Taxidermy and mounting	\$7.89	\$0.83	\$7.50
Clothing used only for fishing (waders, fishing vests, etc.)	\$4.09	\$0.11	\$3.87
Other equipment related items	\$3.02	\$6.20	\$3.19
Boat, motor, trailer, accessories (MAINE)	\$0.00	\$0.00	\$0.00
ATV, snowmobile, trailer, accessories (MAINE)	\$117.06	\$66.86	\$114.28
Travel trailer, tent trailer (pop-up), pickup camper, motor home (MAINE)	\$0.00	\$0.00	\$0.00
Vehicle purchased to use for fishing (MAINE)	\$62.95	\$10.39	\$60.05
Recreational property purchase (MAINE)	\$98.94	\$88.55	\$98.36
Recreational property utilities and maintenance (MAINE)	\$7.70	\$13.11	\$8.00
Camping equipment (tent, sleeping bag, stove, compass, etc.) (MAINE)	\$15.85	\$4.35	\$15.22
Binoculars, camera (MAINE)	\$6.29	\$0.52	\$5.97
Other fishing-related equipment (MAINE)	\$44.92	\$13.71	\$43.20
<b>Total</b>	<b>\$817.56</b>	<b>\$616.56</b>	<b>\$806.46</b>