Executive Summary: Economics of Sport Fishing in Alaska

Prepared By
Sharman Haley, Matthew Berman, Scott Goldsmith,
Alexandra Hill, and Hongjin Kim

Prepared For
Alaska Department of Fish and Game

December 1999

Institute of Social and Economic Research
University of Alaska Anchorage
3211 Providence Drive
Anchorage, Alaska 99508

This executive summary is based on the full report, *Economics of Sport Fishing*. That report is 450 pages and is available from ISER for a $25.00 copying fee, plus postage if ordered by mail. For information, call ISER at 907-786-7710 or e-mail us at ayiser@uaa.alaska.edu.

Executive Summary
Economics of Sport Fishing

Sport anglers reeling in salmon, halibut, and other fish generated—both directly and indirectly—an estimated three percent of jobs and payroll in Alaska in 1993. This is one of the findings of a study of the economics of sport fishing that ISER did for the Alaska Department of Fish and Game.

Sport fishing is enormously popular with residents and visitors. The Department of Fish and Game estimates that nearly half a million anglers fished in Alaska in 1997, with numbers of visiting anglers slightly edging Alaskan anglers. Seven out of ten Alaska households have at least one sport angler. Nearly half of Alaska's households rate hunting and fishing opportunities as important reasons why they live where they do.

The department contracted with ISER to do this study because the economics of sport fishing in Alaska is an important consideration for resource managers allocating fish stocks, evaluating fishery projects, and making decisions about land and water management. The analysis is based largely on information we collected in surveys of sport anglers and guide and charter businesses in 1993 and 1994.

It's not entirely clear how sport fishing has changed since 1993. The Department of Fish and Game reports that the number of resident licenses stayed roughly the same, while the number issued to nonresidents grew about 25 percent. But at the same time, the department also reports that measures of fishing pressure—angler-days fished and numbers of fishing trips—have not changed substantially since 1993. There is some evidence that the growing number of visiting anglers may be mostly casual anglers, who fish once or twice while they're in Alaska. Numbers of sport charters operating in Southcentral and Southeast Alaska increased sharply in the 1990s, and many customers of those charters are tourists who buy single-day licenses.

So the overall economic contribution of sport fishing may not have changed substantially since our survey. In any case, patterns of sport fishing—what people buy for sport fishing and how they travel to sport fishing locations, for instance—don't change quickly. We believe the broad picture of the economics of sport fishing in Alaska that we present here is valid. Below we first describe how we assessed the economics of sport fishing, then profile resident and visiting sport anglers, and conclude with our estimates of the economic value of sport fishing and its contribution to the economy.

Methods of Analysis

At the heart of our analysis is what Alaskans and visitors spend to go sport fishing. Sport anglers spend money for food, lodging, fuel, bait, and guide and charter services for specific fishing trips, but also for campers, boats, cabins, camping gear, and other items they use partly for sport fishing.

We collected information on what anglers spend for sport fishing—as well as information about how many trips they take, what they fish for, and other things—in three surveys. In 1993 and 1994 we did a telephone survey of 1,355 resident sport anglers, a mail survey of 4,278 nonresident sport anglers, and a mail survey (with follow up by telephone) of 331 guide and charter businesses. Table 1 shows survey response rates and margins of error. We divided the state into 11 regions; Table 2 shows how the share of households with sport anglers varied among the regions in 1993.

Table 1. ISER Sport Angler and Guide Surveys, 1993-1994

Survey Respondents	When	Method	Number of Responses	Response Rate	Margin of Error[a]
Sport Anglers Alaska Statewide	June 1993	phone	1,355	83%	±4%
Sport Anglers Alaska Statewide Follow-up[b]	Fall 1993	phone/panel	918	68%	±5%
Non-resident sport anglers	Winter 1993/94	mail	4,278	61%	±2%
Guide and charter businesses[c]	Winter 1993/94	mail/ phone follow-up	331	29%[c]	±11%

[a]This is a standard measure of sampling error representing the 95 percent confidence interval on a yes/no question with 50 percent of respondents answering yes. Confidence intervals for our actual survey estimates are discussed in Appendix G.

[b]ADF&G conducted follow-up interviews with the same respondents interviewed in June.

[c]73 percent of the major firms and 27 percent of the smaller firms responded.

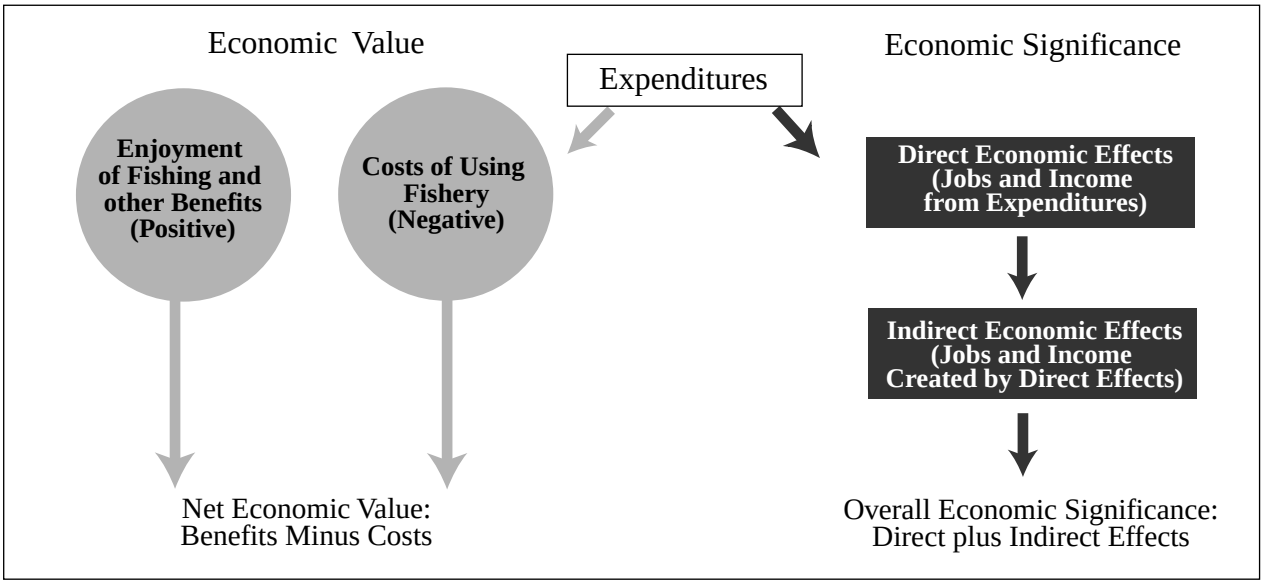
Table 2. Number of Alaska Households with Anglers, by Survey Region, 1993

Region	Total Households*	Households fished previous 3 years	Percent HH fished previous 3 years	Households fished 1993	Percent HH fished 1993
Anchorage	90,725	62,738	69%	43,410	48%
Fairbanks	28,310	18,783	66%	12,209	43%
Kenai	15,510	12,425	80%	9,111	59%
Mat-Su	15,505	12,294	79%	8,156	53%
Kodiak	4,605	3,154	68%	1,532	33%
Remote SC	5,977	4,980	83%	3,096	52%
Juneau	10,669	8,092	76%	4,991	47%
Ketchikan	5,428	3,710	68%	2,474	46%
Sitka	3,098	2,470	80%	1,673	54%
Remote SE	7,291	4,954	68%	2,904	40%
Remote SW&AYK	18,761	10,383	55%	5,290	28%
Total	205,878	143,983	70%	94,846	46%

** Based on 1990 U.S. census household size and 1993 Alaska Department of Labor estimates.*

With information from our surveys and from other sources, we estimated the economics of sport fishing in Alaska. We looked at: (1) economic significance and (2) net economic value. Economic significance measures sport fishing's contributions to economic activity—in jobs, income, and sales. Economic value is an estimate of the overall value anglers place on sport fishing, including both what they actually pay to go fishing and how much more they would be willing to pay. *Net* economic value is that additional "willingness to pay"—a measure of the additional benefits (both monetary and less tangible) that people get from an activity, beyond their out-of-pocket costs. Both are useful measures and both start with expenditures for sport angling—but they measure economic effects in quite different ways, as Figure 1 shows.

Figure 1. Measuring the Economics of Sport Fishing



To calculate the economic significance of sport fishing, we consider expenditures as a means of generating jobs and income both directly (for guides and others in the sport fishing industry) and indirectly (for people who benefit from expenditures of the sport fishing industry). If expenditures drop, then jobs, income, and economic activity drop; if expenditures increase, jobs, income and economic activity increase.

To calculate the net economic value of sport fishing, we consider expenditures as the costs of using the fishery. For instance, if a sport angler hires a fishing guide, that is a cost of using the fishery. People pay such costs in the hope of getting the benefits of the fishery. For sport anglers, the benefits are the pleasures of fishing—catching fish but also less tangible benefits like spending time on a scenic river. After estimating costs and benefits, we subtract costs from benefits. That difference between costs and benefits is the net value.

To do our analyses, we built economic models, using survey and other information. To estimate the economic significance of sport fishing, we created the Alaska input-output model. That model relates changes in spending in a particular industry to total changes in jobs and income in the Alaska economy. It is custom designed to take account of unique characteristics of the state's economy.

Our estimate of economic significance includes jobs, payroll, and sales resulting from sport angler spending in 1993—calculated from projections of spending for sport fishing, based on our surveys of resident and nonresident anglers. The input-output model calculates direct, indirect, and induced effects on total payroll, employment, and sales by industry.

To estimate the net economic value of sport fishing, we built travel cost models—four models for resident anglers and three models for visiting anglers. The travel cost method *indirectly* estimates net value by analyzing anglers' behavior. It predicts the likelihood that an angler will visit a fishing site, based on angler characteristics, measures of fishing quality, and the cost of getting to the site.

Profile of Sport Anglers

As we said at the outset, sport fishing is very important to a lot of Alaskans. Table 3 shows that two-thirds of Alaska households with anglers (which equals nearly half of all Alaska households) describe hunting and fishing opportunities as "very" or "somewhat" important reasons why they live where they do. The importance of sport fishing is also reflected in what angling households own. Among Alaskan households with sport anglers, nearly 40 percent own boats, 4 percent own planes, 6 percent own campers, and 8 percent own cabins they use at least partly for sport fishing trips.

Table 3. Importance of Hunting and Fishing in Why Alaskan Anglers Live in Communities

Importance of Hunting/Fishing Opportunities	Number of Households with Anglers	Percent of Households with Anglers
Very Important	51,750	36%
Somewhat Important	45,284	32%
Not Very Important	45,920	32%
Total	142,954	100%

Figure 2 profiles summer sport fishing among Alaskans. Households with anglers take an average of 4.5 trips per summer, almost entirely on their own; resident anglers report using guide or charter services for only about 6 percent of their summer fishing trips. More than half of fishing trips are within an hour of anglers' homes, and only about one in five trips require more than three hours travel time. The biggest share of trips (57 percent) involve either vehicles and boats or just boats. More than a third of trips involve only cars or other vehicles. Just a very small share (2 percent) involve airplanes.

Sport fishing is concentrated in Southcentral Alaska, with nearly 60 percent of trips to the Kenai Peninsula, the Anchorage area, or the Mat-Su area north of Anchorage. More than a third of all the summer fishing trips Alaskans take are just to the Kenai Peninsula. Southeast Alaska is the next most popular region (19 percent of trips), closely followed by the Mat-Su area north of Anchorage.

More than 40 percent of all sport fishing trips are to the ten most popular sites. As will come as no surprise to those who live in Southcentral Alaska, the most popular individual sites are the Kenai and Russian rivers (14 percent of all trips), followed by sites near Homer and then Resurrection Bay at Seward. The Juneau and Ketchikan areas and Prince of Wales Island in Southeast Alaska also draw many anglers.

The most prized sport fish is king salmon, with nearly a quarter of summer trips targeting that species. Silver and red salmon each draw about 13 percent of trips and trout and halibut around 8 percent each.

Figure 2. Profile of 1993 Summer Sport Fishing Among Alaskans

How Many Households have Anglers?*

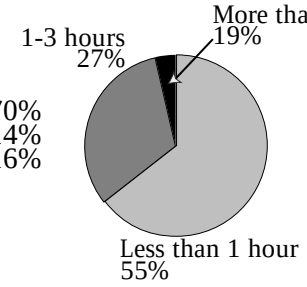
*At least one household member who fished in the previous 3 years.

Trips Using Charter Service
Yes—6%
No—94%

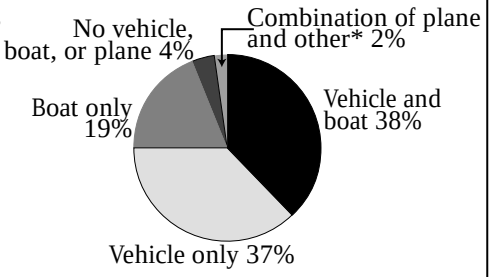
Average # of Fishing Trips Per Summer — 4.5

Length of Trips
1 day — 70%
2 days — 14%
Longer — 16%

Travel Time to Fishing Site
(In Percentage of Trips)

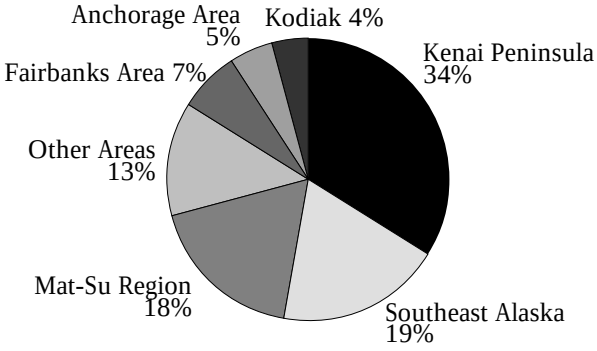


Transportation to Fishing Site
(In Percentage of Trips)



* Plane and boat or vehicle or all three.

Where Do Alaskans Fish?
(Percentage of Total Trips)

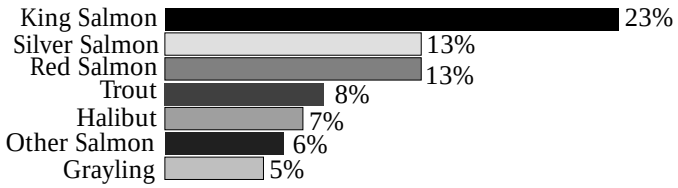


10 Most Popular Sites
(Percentage of Total Trips)

1.	Kenai and Russian Rivers (Southcentral)	14%
2.	Homer area* (Southcentral)	7%
3.	Seward (Resurrection Bay) (Southcentral)	5%
4.	Juneau area (Southeast)	3.5%
5.	Prince of Wales Island area (Southeast)	3%
6.	Delta/Clearwater area (Interior)	2.5%
7.	Little Susitna River (Mat-Su area)	2.5%
8.	Willow Creek (Mat-Su area)	2.5%
9.	Naknek River (Southwest)	2%
10.	Ketchikan area (Southeast)	2%

*Includes Kachemak Bay, Deep Creek, Anchor and Ninilchik Rivers.

Most Popular Target Species
(Percentage of Trips Targeting*)



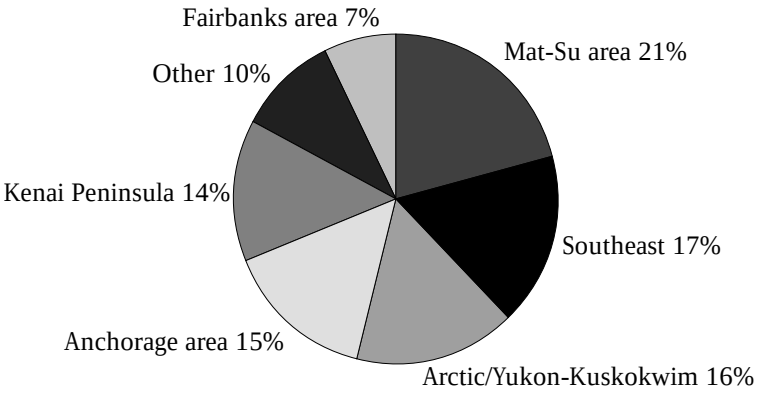
*Not what anglers actually caught, but what they went after. For 25 percent of trips, anglers did not specify targets.

Note: Summer is defined as May through October.

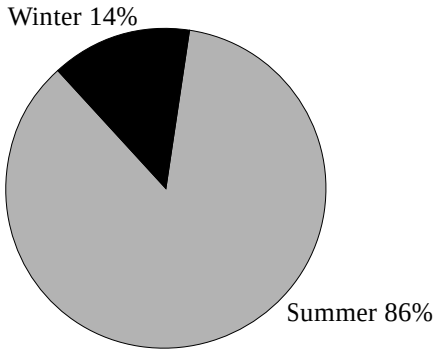
Figure 3 profiles winter sport fishing among Alaskans. Only about 14 percent of trips are during the winter (defined as November through April), and most trips are close to home, requiring less than an hour of travel time. Winter trips are much less concentrated than summer trips, with a much bigger share in the Arctic-Yukon Kuskokwim region. Trout and Dolly Varden are the main species targeted.

Figure 3. Profile of 1993 Winter Sport Fishing Among Alaskans

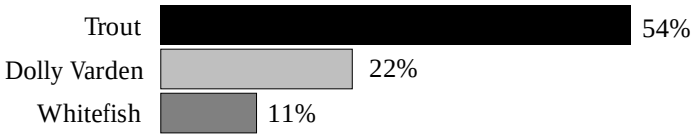
Where Do Alaskans Fish?



What Share of Fishing Trips are in Winter?

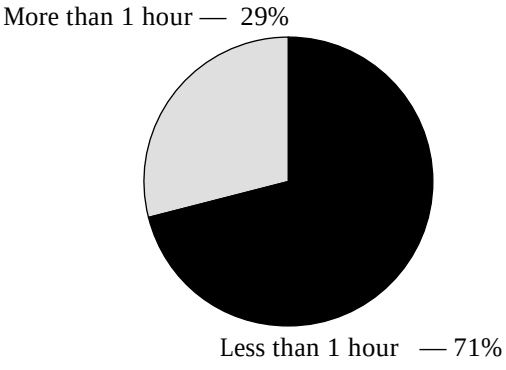


Most Popular Target Species
(Percentages of Trips Targeting)



*What anglers hope to catch,
not necessarily what they do catch.

Travel Time to Fishing Site
(In Percentage of Trips)



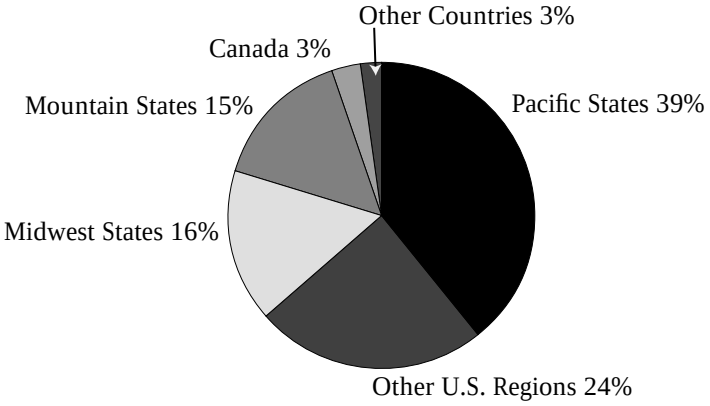
Note: Winter is defined as November through April.

Figure 4 profiles visiting sport anglers. Close to 40 percent of visiting anglers come from the Pacific states and another 30 percent from the Midwest and Mountain states. About 6 percent come from other countries—half of those from Canada. Most visiting "households" are just one or two persons who most typically stay either 8 to 14 days or 5 to 7 days. The most popular month to fish is July.

The Kenai Peninsula is even more popular among visitors than residents, with visiting anglers heading to the Kenai Peninsula for nearly half their trips. The next most popular region is Southeast Alaska, with nearly a quarter of trips by visiting anglers. Visiting anglers most often go after silver salmon and halibut.

Figure 4. Profile of 1993 Visiting Sport Anglers

Where Are Visitors From?
(Percentages of Visiting Households)



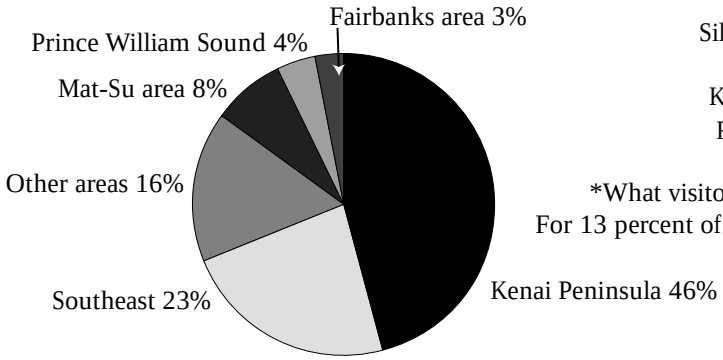
How Long Do Visitors Stay?
(Percentages of Angler Households)

Less than 5 days — 9%
5 -7 days — 29%
8 -14 days — 37%
15 or more — 25%

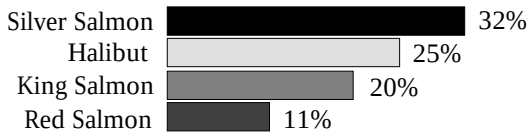
How Many From Household Traveling?

1 person — 43%
2 persons — 42%
More ——— 15%

Where Do Visitors Fish?
(Percentages of Trips)

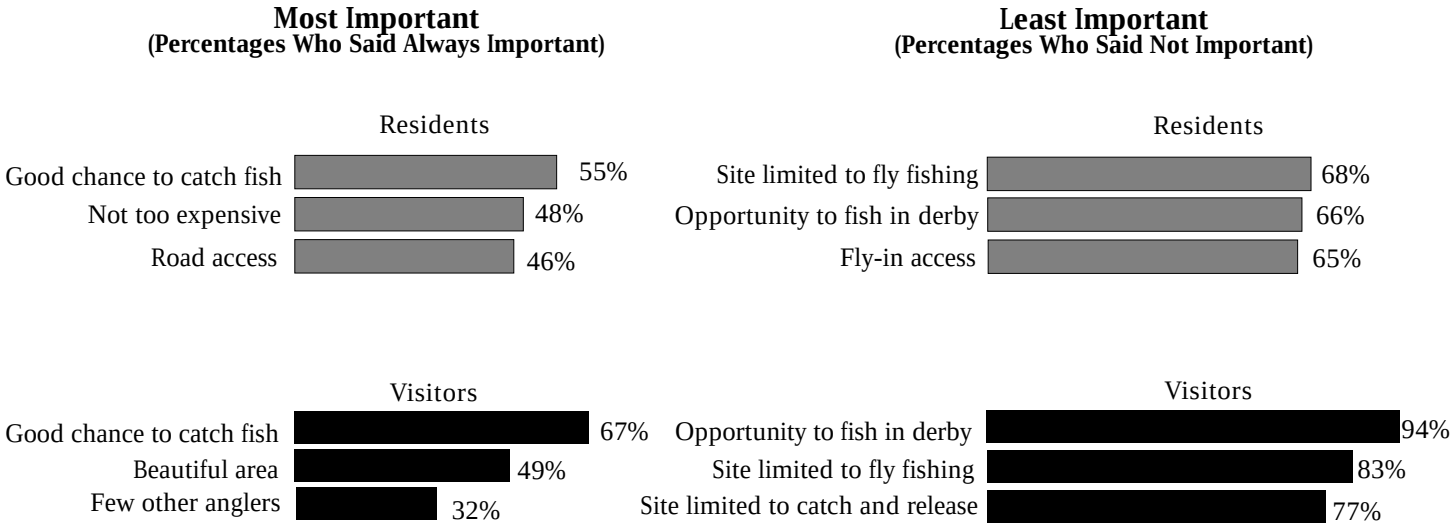


Most Popular Target Species
(Percentages of Trips Targeting*)



*What visitors hope to catch, not necessarily what they do catch.
For 13 percent of trips, anglers cited "salmon" without specifying a species.

Figure 5. Most and Least Important Reasons Why Anglers Choose Sites



How do anglers decide where to fish? Figure 5 shows the most and least important reasons cited by resident and visiting anglers. Not surprisingly, anglers go where they think they have the best chance to catch fish. But interestingly, a bigger share of visiting than resident anglers cited "a good chance" to catch fish as the most important reason they pick sites—67 percent of visitors as compared with 55 percent of residents. Residents are also likely to choose less expensive sites with road access, while visitors look for beautiful areas. Neither residents nor visitors choose sites just because they have fishing derbies or because they are limited to fly fishing.

Economic Significance of Sport Fishing

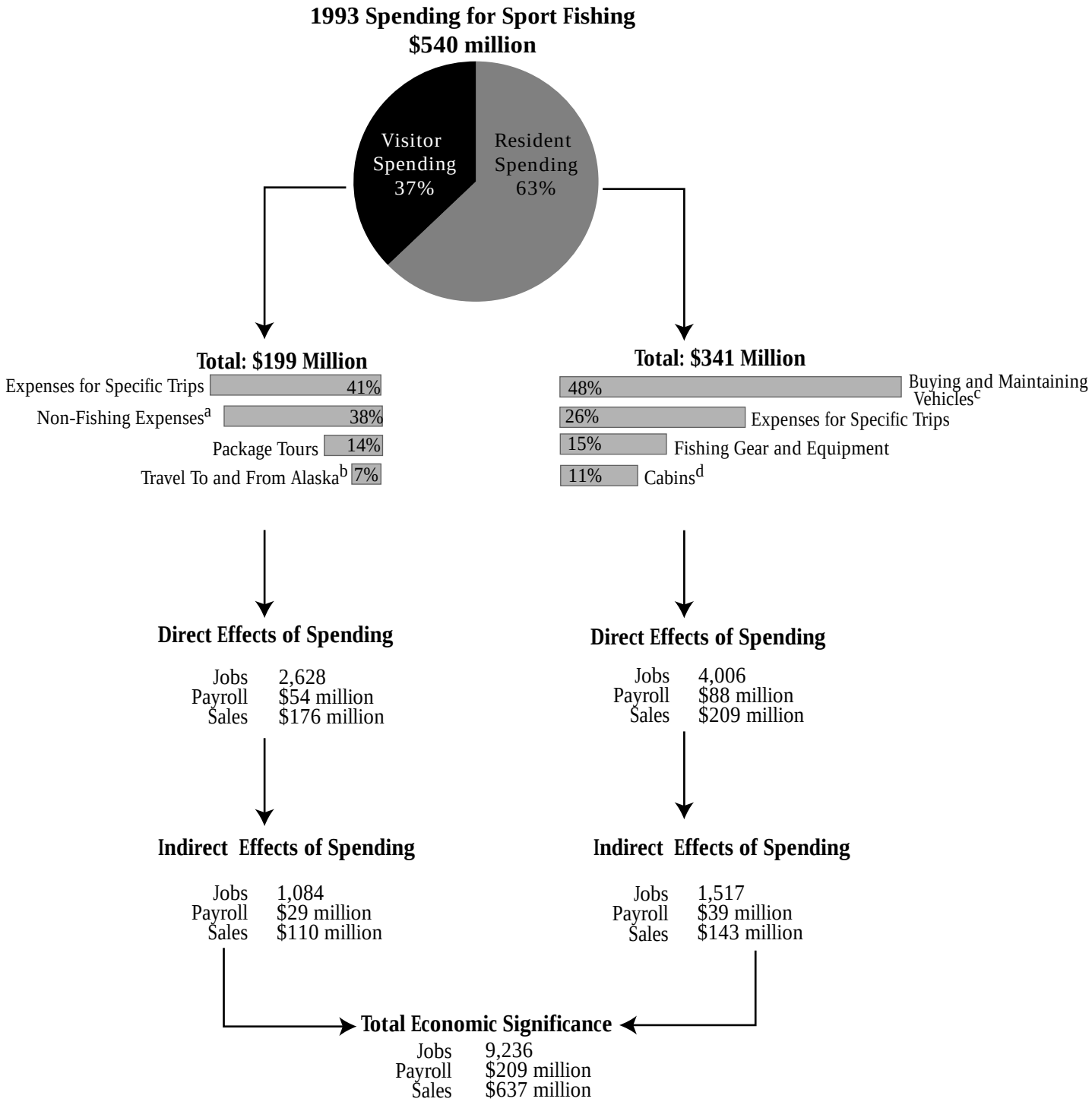
The economic effects of sport fishing start when anglers spend money. Sport anglers spent an estimated $540 million—residents $341 million and visitors $199 million—for sport fishing in 1993 (Figure 6).

For residents, the biggest expense (48 percent) was the share of vehicle costs that can be attributed to sport fishing trips, followed by expenses for specific trips (26 percent) and then fishing gear and equipment (15 percent).

The largest share of visitor expenses (41 percent) was for fishing trips, which include costs of guides and charters. (Visitors also undoubtedly spend a lot for equipment and vehicles they use to go fishing, but those expenses aren't included here, because they don't have an economic effect in Alaska.) The next biggest expense (38 percent) was money they spent during fishing trips but which was not specifically for fishing—for places to stay, for instance. Package tour costs—which typically include costs of fishing, lodging, transportation, and eating—made up about 14 percent of visitor spending.

That spending directly created jobs and payroll in Alaska: an estimated 6,635 jobs and $142 million in payroll in 1993. In turn, this spending created more jobs and payroll as it circulated through the economy: an additional 2,600 jobs and $67 million in payroll. So the total economic significance of sport fishing in 1993 was 9,236 jobs, $209 million in payroll, and $637 million in sales.

Figure 6. Economic Significance of Sport Fishing in Alaska, 1993



[a]This is money visiting anglers spent for items not directly related to fishing on days they fished; this spending is attributable to sport fishing because it occurred during fishing trips.

[b] Includes only the portion of travel expenses that have an instate economic effect.

[c] Includes only the estimated portion of such expenses attributable to sport fishing trips.

[d] Includes only the portion of purchase and maintenance costs attributable to sport fishing.

Figure 7 shows how spending by sport anglers in 1993 was divided among regions. Nearly two-thirds of all spending was in Southcentral Alaska, with resident spending in that region twice as large as visitor spending. Close to 20 percent of spending was in the Southeast, and there visitor spending was slightly higher than resident spending. Almost all the 10 percent of spending in the Northern region was by residents, and most of the 8 percent of spending in the Southwest was by visitors.

Figure 8 shows the differences in trip-related spending by residents and visitors. (That spending excludes equipment and vehicle purchases, which are not tied to specific fishing trips.) Guide and charter services made up the single biggest expense, accounting for a third of all trip spending. Visitors spent most of that. The next largest expense was personal transportation (19 percent of trip spending), with residents spending two-thirds of that. The next largest expenses were for bait and tackle (15 percent) and groceries (13 percent)—again, as you would expect, residents spent the most for those items.

Figure 7. Regional Spending By Sport Anglers, 1993
(Shares of Total Resident and Visitor Spending)

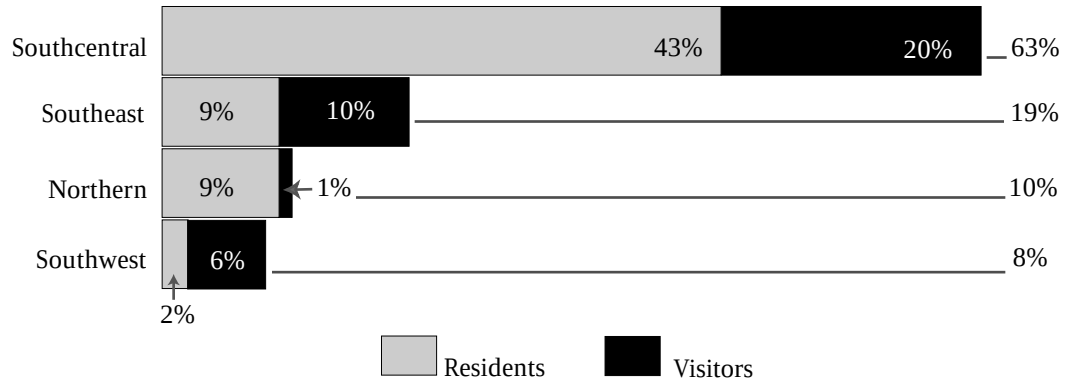
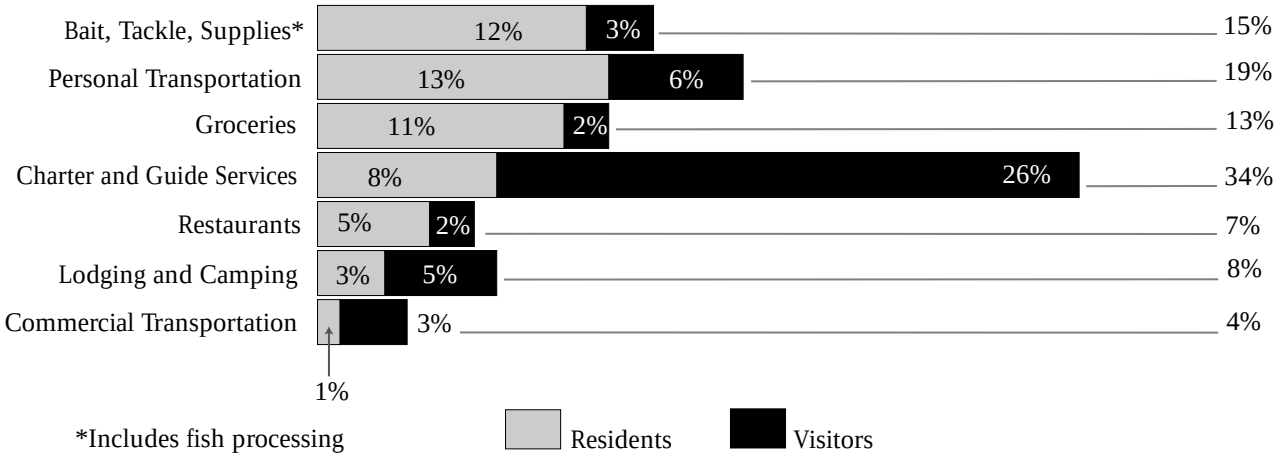


Figure 8. Resident and Visitor Trip Related Spending, By Category, 1993
(Shares of Total Resident and Visitor Spending)

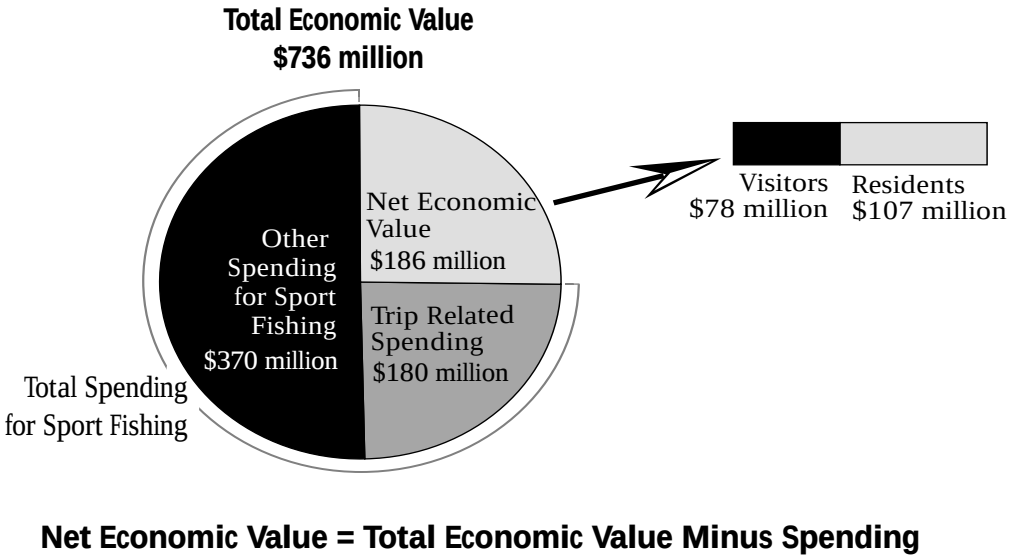


Net Economic Value

Alaskans and visitors valued sport fishing at about $736 million in 1993. That's the combination of what they actually spent for it (around $550 million) and how much more they would have been willing to spend ($186 million). We estimated that total value through travel cost models, which allow us—by analyzing anglers' behavior—to put monetary value on intangible benefits like the enjoyment of fishing.

The additional amount anglers would have been willing to pay—$186 million—is the net economic value: a measure of the additional benefits sport anglers got from fishing in 1993, besides the benefits they paid for. Economists also sometimes refer to net economic value as net willingness to pay—the additional amount anglers would have been willing to pay, besides what they actually did pay.

Figure 9. Total and Net Economic Value of Sport Fishing in Alaska, 1993



Net Economic Value = Total Economic Value Minus Spending

Data and Model Reliability

The surveys and models in this study provide new and valuable information never before collected or reported. Overall, the study provides the only comprehensive and detailed economic data that exist on recreational fishing in Alaska. Still, our results are subject to some error—as are the results of any complex analysis based on detailed information collected through surveys. That's because we can realistically collect data from only a small portion of the population (which can produce sampling error) and because the data collection methods may produce other kinds of error (non-sampling error). The quality of our data, and our modeling decisions, compare favorably with those used in other studies—as evidenced by (among other things) the peer-reviewed publications that have grown out of this study. Still, we emphasize that all our figures are estimates subject to some margin of error. Appendix G of the full report discusses in detail data and model reliability.

The margin of error for any variable that we estimate using a sample increases as sample size declines—for instance, when we look at a region rather than the entire state, or at a variable derived from a question not everyone answered. Also, the margin of error is greater for variables based on questions with a lot of variation in the responses (such as the number of trips households took in a year) and smaller for variables based on questions with less variation in the responses (for example, whether any household member had fished within the past three years). Our statewide estimates have the smallest margins of error. Estimates for the less populated regions, as well as estimates for specific fisheries or locations, have substantially larger margins of error, because they're based on much smaller samples. But the errors are not biased—that is, they do not systematically over- or under-estimate values.

In addition to sampling error, which is unavoidable, we also believe (based on other sources of data) that some respondents under-reported the number of fishing trips they took in 1993. We calculated weights to correct for that under-reporting—but under-reporting nevertheless adds to our uncertainty about how our estimate of fishing trips compares with the actual number of fishing trips in 1993. Another type of non-sampling error could result from reporting errors by respondents—that is, respondents might have made mistakes in reporting where they fished, what they caught, or other variables. Or errors might result if respondents interpreted questions differently—so, for example, their answers might be based on different definitions of what constitutes a fishing trip or of who qualifies as a participant.

We used sample data to generate estimates of the economic significance and of the economic value of the sport fisheries. These analyses required the use of assumptions and models. We are relatively confident in our estimates of economic significance, which are based on survey information about the pattern of sport fishing expenditures and on our knowledge about the structure of the Alaska economy. Our estimates of net economic value, by contrast, are based on our ability to predict anglers' behavior, using available information about angler characteristics, quality of fishing at various sites, and costs of going fishing. Our model calculations are affected by many factors, including variables that we weren't able to include because no data exists.