Chapter 4. Economic Significance of Sport Fishing in Alaska

Here we estimate the economic significance of sport fishing—for the state, for regions, and for selected fishing sites, fisheries, and species. “Significance” measures all the jobs, payroll, and sales associated with sport fishing, based on an estimate of what anglers spend for fishing and the additional economic activity generated by that initial spending. Remember (as discussed on page 4-30) that this is not a measure of how much economic activity would disappear, if there were no sport fishing. Without fishing, anglers would still spend (in other ways) at least some of what they previously spent for sport fishing, continuing to generate jobs and income.

Spending for sport fishing has direct, indirect, and induced effects on jobs and payroll. The direct effect is the jobs created and payroll paid in businesses selling directly to the anglers, such as food stores and guide services. The indirect effect is the jobs created and payroll paid in those businesses that sell to businesses providing goods and services directly to anglers; these include, for example, truck drivers delivering stock to the food stores and advertising agents providing services to the guides. The induced effect is the jobs created and payroll paid in businesses that provide goods and services to the employees holding the direct and indirect jobs—such as the food store worker and the guide.

Summary of Statewide Economic Significance

In 1993, residents and nonresidents spent $540 million in Alaska on goods and services attributable to sport fishing. Of this total, residents spent $341 million, or 63 percent, and nonresidents spent $199 million. That spending directly accounted for 6,635 jobs (annual average equivalent basis), with a payroll of $142 million. The indirect and induced effects of this activity accounted for an additional 2,601 jobs and $67 million in payroll which, when added to the direct jobs and payroll, resulted in total economic activity represented by 9,236 jobs (annual average equivalent) and $209 million in payroll. Total sales attributable to sport fishing, including indirect and induced effects, were $637 million.

Methodology

We began the analysis with data from ISER surveys of what resident and nonresident angler households spent for sport fishing in Alaska in 1993. We also used information from the 1993-94 ISER survey of guide and charter businesses. The infinite variety of possible types of human behavior makes it impossible to capture and summarize all possible trip varieties and combinations in the survey questions and analysis; rather we attempted to characterize the most common and important types of behavior.

We identified several types of spending related to sport fishing and allocated either all or a portion of spending in each category to sport fishing. For residents we used three categories of expenditure: (1) trip-specific expenditures, which can be identified as related to a single fishing trip—for instance, bait or fuel to get to the fishing site—including guide
expenditures; (2) capital expenditures for equipment—both for equipment exclusively for fishing, such as rods and reels, and for equipment only partially used for fishing, such as camping equipment used not only for fishing but also for hunting or general recreation; (3) capital expenditures and general maintenance expenditures for cars, other motor vehicles, boats, and planes, as well as for cabins. Capital expenditures include any purchases not consumed during single trips.

For nonresidents, we used four types of expenditures: (1) trip-specific expenditures; (2) package tour expenditures—that is, costs of tours visitors purchase before arriving in the state and usually including transportation to and from Alaska and a variety of other tourist-related services such as food, lodging, and transportation within the state; (3) other spending (mainly for food and lodging) by nonresidents on days they were fishing, but which was not specifically related to fishing trips; (4) travel expenses to and from Alaska.

We allocated a portion of capital expenses, spending not tied to specific fishing trips, package tour costs, and costs of travel to and from Alaska to sport fishing. The portion attributed to sport fishing depended on, among other things, how much of vehicle and other equipment use was for sport fishing; whether certain trips had purposes other than fishing; and whether visiting anglers would have come to Alaska anyway, even if they couldn’t fish. Our allocation procedures are discussed more in relevant sections of this chapter and in Appendix B.

We then constructed expenditure profiles for resident and nonresident anglers. We ran each expenditure profile through a commodity by industry matrix, to produce a final demand vector which, in conjunction with the Alaska input-output model developed for this study, generated estimates of economic significance. Details about this process are in Appendix B.

**Total and Regional Expenditures and Economic Significance**

Map 4-1 shows the regions used in this analysis. Table 4-1 shows total expenditures related to sport fishing in Alaska in 1993 and regional expenditure figures. The total amount spent on goods and services used (either partly or exclusively) in sport fishing in Alaska was actually $1,334 million. From that total we netted out $766 million in spending that was associated with other activities. For residents we included only a portion of spending on vehicles (cars, boats, planes, campers); on other general outdoor equipment; and on cabins used for sport fishing, since those things are often used for other activities as well. We also netted out a portion of expenditures anglers actually made during fishing trips since, in many cases, fishing is only one of the reasons for the trip. For nonresidents we included only the portion of their expenditures to and from Alaska that was for transportation services provided within the state. Also, we included only a portion of nonresident expenditures that were not specifically for fishing trips, based on whether the households would have come to Alaska anyway, if they had been unable to fish. With these adjustments, we estimated $568 million of spending was attributable to sport fishing in Alaska in 1993. Finally, we subtracted another $29 million, to account for what residents spent outside the state on supplies and equipment used in Alaska.
Table 4-1 also shows the relative importance of the various categories of angler spending attributable to sport fishing. For residents, spending associated with the purchase and maintenance of vehicles accounted for 51 percent of the total. Next, in order of importance, were expenditures attributable to specific fishing trips, which accounted for 22 percent of the total. This was followed in importance by fishing-related capital expenditures—like fishing gear—but excluding vehicles and spending on cabins. Nonresidents spent the largest amount on trip-specific expenditures, but almost as much on other expenditures while in the state during the days they were fishing. Nonresident anglers spent a large amount on package tours, but only a portion of that is attributable to sport fishing. Their instate expenditures on transportation services associated with travel to and from the state were also relatively small.
Table 4-1 also summarizes the regional distribution of instate spending attributable to sport fishing, by showing the location where the spending actually took place. Sixty-three percent of statewide spending, $338 million, occurred in Southcentral Alaska, followed by Southeast with 19 percent, or $105 million. The Northern region accounted for $56 million; the Southwest had the smallest share with $41 million. The regions differ in the share of expenditures accounted for by residents and nonresidents. In the Southwest, almost 80 percent of the expenditures were made by nonresidents. In the Southeast nonresidents accounted for only a little more than half of the total. In the Southcentral region, resident expenditures dominated, but because the total angler spending in Southcentral was so large, more than half of all nonresident spending occurred there. In the Northern region most of the spending was by residents. (Confidence intervals for the estimates in Table 4-1 are discussed in Appendix G.)

Table 4-2 summarizes several measures of the economic significance of sport fishing by region. Of the 9,236 annual average equivalent jobs associated with sport fishing activity in Alaska, 6,100 were located in Southcentral Alaska, 1,751 in Southeast, 910 in the Northern region, and 475 in the Southwest. Payrolls and sales followed a similar pattern. The largest portion of the total jobs, payroll, and sales came directly from the businesses that sold goods and services to the sport fishermen. This appears in the table as the direct effect. The indirect/induced effect is the result of spending by these businesses serving the sport fishermen. The direct effect economic multipliers show the ratio of the total to the direct effect for sales, payroll, and employment. For example, on average, 1.39 total jobs were created for every job in a business providing goods and services related to sport fishing. The final demand multipliers reflect the same information but show the total sales, payroll, and employment associated with $1 million in spending related to sport fishing within the state. For example, $1 million of additional spending related to sport fishing will support 24 full-time equivalent jobs in the economy. More detailed tables showing economic significance are contained in Appendix F.
Residents spent $891 million on goods and services that were used at least partly in the pursuit of sport fishing in 1993 (Table 4-3). The portion we attributed to sport fishing was $370 million, and the amount actually spent within Alaska was $341 million. The largest share was spent in Southcentral Alaska, followed by Southeast and then the Northern region; the least was spent in the Southwest. We included in our estimate all anglers, including those not required to obtain fishing licenses.

Including food, lodging, supplies, guiding services, commercial transport, and personal transport, residents spent $101 million on trip-specific expenditures in 1993. As one might expect, gas, groceries, and supplies were the most important items, and 95 percent of these expenditures occurred during the summer months, with only 5 percent occurring in the winter season (November through April). Of this $101 million, we attributed $88.7 million to fishing, since people often have multiple purposes when they take trips that involve fishing. All these trip-specific expenditures occurred within the state, and almost all occurred within the anglers’ region of residence, since only a few resident trips took anglers outside their home regions.

In 1993 Alaskans spent a total of $69 million on fishing-related capital expenditures, consisting of both fishing gear and miscellaneous equipment, such as camping gear, that is used both for fishing and other activities such as hunting. Of the $54 million that is attributable just to sport fishing, about 93 percent was spent within Alaska, with the remainder spent outside the state, either through catalogues or when Alaskans took trips out of the state. In estimating these expenditures, we recognized that not all anglers fish every year. For determining fishing-related expenditures on equipment, vehicles, and cabins, we consider any household that fished in any of the three preceding years to be an angler household.

Alaskans also spent $646 million in 1993 to buy, maintain, and insure vehicles used for sport fishing. Most of this was for cars (including trucks and motor homes), but it also included $151 million for boats and $39 million for planes. Boats were most often used for fishing, followed by planes and then cars. We attributed a portion of this spending to sport fishing, based on the percentage of total running time that was for sport fishing. After netting out purchases made outside Alaska, we estimated residents spent $163 million in Alaska on transportation-related expenditures for sport fishing in general, but not connected to specific trips. Half of this was expenditures for boats, with spending for cars almost as large, followed by spending for planes.

Alaskans also spent $75 million buying and maintaining cabins and land used in connection with sport fishing. About half of this, $39 million, was attributable just to sport fishing.
The importance of vehicles in total expenditures for sport fishing is underscored by the large number of Alaska’s angler households that own transportation equipment used in sport fishing. Table 4-4 shows that 39 percent of resident angler households own boats used for sport fishing; 8 percent own cabins; 5 percent own motor homes; 4 percent own planes; and 4 percent own land. Some households own more than one of these items. The total market value of these items attributable to sport fishing is estimated to be $1,381 million.

Our regional distribution of sport fishing expenditures is based on anglers’ responses on the ISER survey of resident anglers. Although most anglers fish—and report spending money for sport fishing—in the regions where they live, there are some exceptions. Anglers who live in one region and fish in another probably report some expenditures in both regions. In addition, expenditures associated with some sites typically occur or are reported outside the region where those sites are located. This is most likely the case for guiding expenditures in Southwest Alaska, which are sometimes reported in the Southcentral region, since that region is often the home base for either travel agents or guiding operations. Finally, since the expenditures reported in Table 4-4 are based on a survey of a sample of anglers, there may in fact have been regional expenditures within a category in a region, even if none of our surveyed anglers reported expenditures in that category.

Resident sport fishing expenditures do not generally represent “new” purchasing power coming into the economy and, consequently, we cannot treat these purchases as an increase in final demand. For example, the money residents spent on food while on fishing trips is offset by a reduction in the amount they spent on food at home. If an angler foregoes the purchase of a new rod and reel, it will probably be because another expenditure is more important. Because of the fact that resident anglers would be spending their income on something else if they were fishing less means that resident sport fishing expenditures cannot be said to generate an increase in employment, payrolls, and sales within the economy. If residents spent $341 million more on other activities besides fishing, the number of jobs and sales in the economy would be approximately the same because total purchasing power would be unchanged.
The direct effect of resident sport fishing expenditures on sales by industry and region is shown in Table 4-5. The total of $209 million in direct effect is considerably less than the amount expended instate by resident anglers because of “leakages.” These leakages are due to the absence of any significant instate manufacturing and the fact that some expenditures do not generate economic activity. Because so little is manufactured in Alaska, dollars associated with the purchase of new equipment and vehicles flow directly outside the state after passing through the hands of the retailer and have no further effect on the Alaska economy. In addition, the purchase of used vehicles, previously owned cabins, and land represents a transfer of an asset, but only the transaction costs, typically about 10 percent of the purchase price, generate instate economic activity.

Sport fishing expenditures directly influence the majority of industries in the economy, with the largest concentrations in the retail trade and business services sectors. Other sectors with significant final demand attributable to resident sport fishing are insurance, other manufacturing, eating and drinking, transit, health services, wholesale trade, and chemicals and petroleum processing. In Table 4-5 we do not explicitly identify the guide and charter industry, since its activities span many of the traditional business sector categories.

The total economic significance of the resident sport fishery—employment, payroll, and sales—is shown by industry in Table 4-6. This table includes the direct, indirect, and induced effects of resident sport fish expenditures. We can see that once the multiplier effect of resident sport fish spending is taken into account, the flow of that money through the economy influences all sectors. As with the direct effect, the sectors most influenced by sport fish spending are retail trade and personal services. In 1993, a total of 5,524 annual average equivalent jobs with a payroll of $127 million were attributable to resident sport fish spending. Sales, net of leaks of the cost of manufactured goods and the value of transfers of assets, totaled $351 million.

Table 4-7 summarizes several measures of the economic significance of resident sport fishing by region. Of the 5,524 annual average equivalent jobs associated with sport fishing activity in Alaska, 3,832 were in Southcentral Alaska, 794 in Southeast, 774 in the Northern region, and 123 in the Southwest. Payrolls and sales followed a similar pattern. The largest portion of the total jobs, payroll, and sales came directly from the businesses that sell goods and services to the sport fishermen. This is shown in the table as the direct effect. The indirect/induced effect is the result of spending by the businesses serving the sport fishermen. The direct effect economic multipliers, as well as the final demand multipliers, are approximately the same as those for the entire sport fishery, shown in Table 4-2. More detailed tables showing economic significance of the resident sport fishery are contained in Appendix F.

The resident economic significance can be broken out between expenditures that are related specifically to sport fishing trips and those that are not related to trips. Summer trip-related expenditures resulted in total employment of 1,234, payroll of $27 million, and sales of $92 million. Winter trip-related expenditures resulted in total employment of 68, payroll of $1 million, and sales of $5 million. Expenditures not related to trips cannot be divided between summer and winter fishing; total employment resulting from those expenditures was 4,222, with a payroll of $98 million and sales of $243 million. These calculations are shown in detail in Appendix F.
Nonresident Sport Fishing Expenditures

Visiting anglers spent $442 million on goods and services used at least partly in the pursuit of sport fishing in Alaska in 1993 (Table 4-8). There are several ways to allocate the expenditures of nonresidents between sport fishing and other activities, since most visitors come to Alaska for more reasons than just fishing. Our solution to the allocation problem was to divide the visiting anglers into two groups—those who would not have come to Alaska if they had not been able to fish, and those who would have come anyway. For the first group—avid anglers—we attributed all their expenditures to sport fishing, even if they did other things as well. For the second group—casual anglers—we assigned all their spending for fishing trips, but only 31 percent of their other spending, to sport fishing. The percentage we assigned to sport fishing was based on the proportion of days during their visits that they actually spent sport fishing.

Using this allocation method, we estimated that nonresident sport fishing activity drew $199 million of spending into Alaska in 1993—spending that would have gone elsewhere except for sport fishing. The largest share was spent in the Southcentral region, followed by the Southeast, the Southwest, and the Northern region, where nonresidents spent the least. We included in our estimate all anglers, including those not required to obtain fishing licenses.

Visiting anglers spent $80 million on trip-specific expenditures, including food, lodging, supplies, guiding services, commercial transport, and personal transport. For nonresidents, guiding services made up the largest component of trip-specific expenditures, accounting for $44 million, or 55 percent. We attributed all trip-specific expenditures for nonresidents to fishing, although in some instances a trip might have had more than one purpose. All these trip-specific expenditures occurred within the state.

Nonresidents who fished spent $98 million on package tours in 1993. These packages generally included the cost of travel to and from the state. Netting out this travel left $62 million for package tour expenditures not related to travel for visiting anglers. Of that $62 million, $28 million was attributable to sport fishing, based on whether the visiting households would have come to Alaska anyway, if they had not been able to fish. For the 40 percent of nonresident households that would not have come to Alaska if they had not been able to fish, we attributed all of their instate package tour expenditures to sport fishing. For the 60 percent who would have come to Alaska anyway, even if they had not been able to fish, we attributed none of their instate package tour expenditures to sport fishing.

Although nonresident sport fishermen spend large amounts on fishing-related capital expenditures, these expenditures are not generally made within Alaska so this category was zero for the nonresidents.

Nonresident fishermen spent $166 million on goods and services (primarily food and lodging) not directly related to fishing while they were in Alaska. We attributed 45 percent of this, $75 million, to fishing, based on anglers’ reasons for visiting the state and their length of stay. We attributed all instate spending to sport fishing for those anglers who would not have come if they had not been able to fish. For those anglers who would have come in any
event, we assigned a portion of their non-fishing expenditures to sport fishing, based on the ratio of their sport fishing days to total days in Alaska.
Nonresidents spent $134 million on travel to and from Alaska in 1993. They spent most of this money before coming to Alaska, since air travel was the most common means nonresident anglers used to get to Alaska. However, we recognize that a portion of the nonresident budget for transportation to and from the state has an instate economic effect, since some of the transportation services are provided in Alaska. For example, visitors arriving by air require ticket agents, baggage handlers, airplane maintenance staff, and other support personnel to service the aircraft and passengers. Some of the pilots live in the state. These considerations resulted in an instate allocation of a portion of the budget for nonresident travel to and from Alaska by plane, cruise ship, and ferry. We assumed that all expenditures up to the Alaska border by visiting anglers arriving by car occurred outside the state.

In determining what share of travel expenses to and from Alaska to allocate instate, we distinguished between those visiting households that said they would not have come to Alaska if they had not been able to fish and those who said they would have come anyway. For the 41 percent of nonresident households that said they would not have come if they hadn’t been able to fish, we attributed all their travel expenses to and from Alaska to sport fishing. For those households that said they would have come anyway, we didn’t attribute any of their travel costs to and from Alaska to sport fishing.

To allocate expenditures for instate transportation services, we again divided nonresident anglers into two categories. For those who said they would not have come if they couldn’t fish, we assigned all spending for instate travel services to sport fishing. For those who said they would have come anyway, even if they couldn’t fish, we assigned 31 percent of their instate travel expenses to sport fishing, using the ratio of the days they spent sport fishing to their total days in Alaska. This procedure resulted in a total of $15 million attributable to sport fishing from nonresident spending for instate transportation, mostly air transportation.

The composition and regional distribution of nonresident sport fishing expenditures is different from that of residents. Although residents and nonresidents reported spending about the same amount for trip-specific expenditures, the nonresidents spent a much larger portion of their trip-specific expenditures on guide services. Also, nonresident spending was more concentrated in Southeast and Southwest Alaska than was resident angler spending.

In contrast to resident sport fishing expenditures, which reflect the purchasing power of resident Alaskans who would spend their money on other things if they could not fish, nonresident sport fishing expenditures are an addition to the aggregate purchasing power in the economy. This will be the case as long as these nonresidents would have spent their money outside Alaska if they could not fish. If this is the case, we can treat nonresident sport fishing expenditures as an increase in final demand, which does not draw purchasing power away from other sectors of the economy. ¹

¹ The nonresident sport fishing analysis could be characterized as an economic impact analysis. Sales to nonresident sport fishermen have the same qualitative effect on the economy as the sales of the commercial fishery, the mineral industry, or the timber industry. In all these instances, increases in sales result in the creation of new jobs and income for Alaskans. Like these other sectors, the nonresident sport fishery is a basic industry. See page 4-30 for a discussion of “significance” and “impact” analysis.
The direct effect on sales by industry and region of nonresident sport fishing expenditures is shown in Table 4-9. The total of $177 million in direct effect is slightly less than the amount expended instate by nonresident anglers, due to the lack of any significant instate manufacturing and the outside purchases of some guiding firms. Because of the absence of manufacturing, dollars associated with the purchase of most goods flow directly outside the state after passing through the hands of the retailer and have no further effect on the Alaska economy. The purchase of services from some Alaska guiding firms actually represents purchases made outside Alaska. For example, if groceries at a lodge are purchased directly from Seattle, those dollars effectively bypass the Alaska economy even if they appear to be spent in the state.

Like the spending of resident anglers, spending by nonresident anglers directly influences the majority of industries in the economy. However, in contrast to resident expenditures, a larger concentration of nonresident spending is in the lodging and eating and drinking business sectors. Other sectors with significant final demand attributable to nonresident sport fishing are air transportation, other transportation services, retail trade, and business services. Guiding services are not separately identified here as an industry.

Table 4-10 shows the total economic significance of the nonresident sport fishery by industry for employment, payroll, and sales. This table includes the direct, indirect, and induced effects of nonresident sport fish expenditures. We can see that once the multiplier effect of nonresident sport fish spending is taken into account, all sectors of the economy are influenced by the flow of sport fishing expenditures. As with the direct effect, the sectors most influenced by nonresident sport fish spending are lodging and eating and drinking. A total of 3,712 annual average equivalent jobs were attributable to nonresident sport fish spending in 1993, with a payroll of $84 million. Sales, net of what leaked out of the Alaska economy because of the lack of instate manufacturing and because of some direct outside purchases, were $286 million.

Table 4-11 summarizes several measures of the economic significance of nonresident sport fishing by region. Of the 3,712 annual average equivalent jobs associated with nonresident sport fishing activity in Alaska, 2,268 were located in Southcentral Alaska; 957 were in the Southeast; 352 were in the Southwest region; and 135 were in the Northern region. Payrolls and sales followed a similar pattern.

Comparison of the nonresident economic significance with that of the resident anglers shown in Table 4-7 shows that more economic activity in Southeast and Southwest Alaska was attributable to nonresident angler spending than resident spending. In the Southeast, 957 jobs were attributable to nonresidents compared to 794 for residents. In Southwest Alaska, 352 jobs were attributable to nonresidents compared to 123 for residents. In contrast, in Southcentral Alaska, 3,832 jobs were attributable to residents and 2,268 to nonresidents, while in the Northern region 774 jobs were attributable to residents and 135 to nonresidents.

The largest portion of the total jobs, payroll, and sales came directly from the businesses that sell goods and services to the sport anglers. This is shown in Table 4-11 as the direct effect. The indirect/induced effect is the result of spending by the businesses serving the sport
anglers. The direct effect economic multipliers, as well as the final demand multipliers, are about the same as those calculated in Table 4-2 for the entire sport fishery. More detailed tables showing economic significance of the nonresident sport fishery are contained in Appendix F.
Guide and Charter Expenditures

The most readily identifiable sector of the economy influenced by sport fish spending is the industry loosely defined as guides and charters, which includes businesses that provide guiding services, transportation services (primarily boats and planes), food, lodging, and miscellaneous other goods and services in conjunction with those primary activities. We estimated total sales of this industry to be $110 million, with total full-time equivalent employment of 1,250 distributed by region, as shown in Table 4-12. This table also shows that 73 percent—$80 million—of the sales of guide and charter businesses were for sport fishing activities. This is greater than the expenditures of $56 million reported by sport fishermen themselves for guide and charter services. This is because a portion of expenditures on package tours was attributable to guide and charter businesses.

The total economic significance of guide and charter spending associated with the sport fishery is shown in Table 4-13 by industry for employment, payroll, and sales. This table includes the direct, indirect, and induced effects of guide and charter spending by both residents and nonresidents. We see that once the multiplier effect is taken into account, all sectors are influenced by this flow of sport fishing expenditures through the economy. In 1993, a total of 1,396 annual average equivalent jobs with a payroll of $34 million were attributable to nonresident sport fishing spending. Sales, net of leaks of the cost of manufactured goods, were $118 million.

Table 4-14 summarizes several measures of the economic significance of guide and charter spending by region. Of the 1,396 annual average equivalent jobs associated with the purchase of guide and charter services, 781 were located in Southcentral Alaska, 427 were in the Southeast, 147 were in the Southwest region, and 41 were in the Northern region. These regional totals are net of a portion of guide and charter jobs created in the Southwest and the Northern regions, which went to nonresidents. As shown in Table 4-12, the percentage of nonresident employment in guide and charter firms in these regions was high. Since nonresident employees spend most of their income outside the state, their earning and, consequently, the jobs associated with their earnings, do not appear in these estimates.
Average Expenditures

Average instate expenditures per household, angler, and trip are presented in Table 4-15. We derived these average expenditures figures by dividing the total estimated number of fishing trips (for residents and for nonresidents) by the estimated number of angling households (again, resident and nonresident). (Confidence intervals for these estimates are discussed in Appendix G.) These average expenditure figures help fill out the broad picture of what anglers spend in Alaska.

These estimates separately identify trip-specific expenditures and other expenditures related to sport fishing but not tied to specific trips. For residents, those other expenditures include spending on capital equipment and for nonresidents include living expenses while they’re in Alaska as well as some of the expenditures associated with travel to and from the state. For residents, these figures show the economic significance of sport fishing and for nonresidents they are an estimate of the spending that generates economic impact in Alaska.

The expenditures that are not trip-specific are allocated equally across all trips. This assumption works in the aggregate, but not when we are calculating the economic impact or significance of specific types of sport fishing trips or of fishing trips that target more than one species. For those more narrow analyses, we can easily identify only expenditures specific to those trips.
Economics of Sport Fishing

Economic Significance of Sport Fishing Sites, Species, and Fisheries

It’s important to emphasize here that an economic significance analysis is not the same as an economic impact analysis—which is the term most people are familiar with. Before presenting our estimates of the economic significance of fishing sites and species, below we first discuss the difference between “significance” and “impact,” to help readers understand what we are in fact measuring.

Distinguishing Significance Analysis from Impact Analysis

An economy grows when more money comes into it—or shrinks when there is less money circulating. Within an economy—which could be anything from the national economy to a local economy in a village—people choose how they will spend their incomes. If they spend more on one thing, they will spend less on another—so the total amount of purchasing power in the economy doesn’t change, although the composition of that spending may change. But if, for instance, a new mine opens in Alaska and begins exporting zinc, those exports bring new money into Alaska’s economy—so purchasing power in the state does grow.

Economic significance analysis measures and describes the amount of economic activity attributable to spending for some particular thing—in our analysis, economic activity attributable to sport fishing. It measures how changes in spending for sport fishing affect the economic activity associated with sport fishing. It does not, however, attempt to measure how aggregate spending in the economy changes because of changes in spending for sport fishing.

Economic impact analysis, by contrast, does take into account the change in aggregate purchasing power in an economy when spending for some specific activity changes. If sport anglers spend more for sport fishing, they spend less for other things. Impact analysis measures that substitution effect, to produce an estimate of how aggregate purchasing power in an economy changes when spending for some activity changes. The types of changes we could assess using economic impact analysis include things like an increase in the number of non-local sport anglers fishing in a specific region; an increase in the number of tourists traveling to Alaska to fish; or a restriction on access to some fishery that had the effect of reducing the number of tourists who come to Alaska to fish.

Depending on the boundaries of the economic region under analysis, sport fishing expenditures in Alaska may or may not represent new purchasing power coming into the economy. In general, the smaller the definition of the region of analysis—an individual fishing community, for example—the more likely it is that a change in sport fishing expenditures represents a change in aggregate purchasing power in the region. That’s because the smaller the region, the more likely it is that whatever substitutions in spending anglers make will be outside the region.

Let’s consider sport fishing on the Kenai Peninsula, for instance. If fishing on the Kenai Peninsula were closed, that area would suffer a significant economic loss. That’s because most anglers who fish for salmon on the Kenai Peninsula do not live on the peninsula—they are either from other areas of Alaska or from outside the state. So whatever they spend locally for sport fishing is an infusion of money into the peninsula’s economy. The loss to the
statewide economy would be smaller, because Alaskan anglers would likely substitute other kinds of spending in Alaska, if they could no longer fish on the Kenai. But visiting anglers who wanted to fish on the Kenai would be less likely to spend that money in other ways in Alaska—so the statewide economy would suffer some loss.

Our travel cost model is, however, unable to predict how anglers would substitute spending for other kinds of activities besides sport fishing, if they lost the opportunity to fish at a site or for a species. In general, resident anglers might be expected to spend the same amount in the economy, whether they could fish for a particular species or not. We can assume that whatever they didn’t spend to fish for a particular species they would spend on other fishing or on other activities such as hunting. Since we do not have information on the characteristics of potential spending on other activities, we can not do an economic impact analysis. As a first approximation, however, the statewide economic impact for resident anglers of losing a species or a fishery, as compared to the economic significance, would be zero—since the loss of expenditures from the closure would be offset by an equivalent increase in expenditures on other activities within the state.

Tourism (including visits by nonresident anglers) is a basic industry for Alaska, since it brings money into the economy and stimulates job and income creation in Alaska. The closure of a sport fishery could cause nonresident anglers to shift some of their spending to other fisheries or to other activities in Alaska— but it could also cause them to spend more outside Alaska. For example, they might sport fish at sites outside Alaska; they might spend less in Alaska, even while visiting for the same length of time; or they might shorten or cancel trips to Alaska. Any reduced tourist spending in Alaska would cost the state jobs and income.

We were not able to estimate economic impact for nonresident fishing, since our nonresident travel cost model does not allow for a reduction in the total number of trips taken when a fishery is eliminated. Also, our model captures very little of the variation in nonresident expenditures by site, so a simple reallocation of expenditures across sites would have little effect. Below we discuss how we did allocate and measure sport fishing expenditures to estimate economic significance of sites and species.

**Allocating and Measuring Expenditures**

To analyze the economic importance of particular species or sites, we have to first estimate how much spending is associated with them. As we noted earlier, there are two categories of spending to consider. Some expenses are trip-specific, which means the expenditures would not have occurred if the particular fishing trip had not taken place. The other is more general spending that is for sport fishing but that can’t be identified with a particular trip. Below we describe three possible ways to measure the expenditures associated with a site or a species. Each succeeding method results in a smaller estimate of expenditures.

One method is to look at the total spending associated with sport fishing, and from that to calculate the *average* spending per angler or per trip, including expenditures not specific to trips. This would be the appropriate measure for estimating the economic contribution of adding a new angler, resident or nonresident, to those already fishing.
A second method is to look only at the trip-specific expenditures. For existing fishermen the expenditures associated with a change in the number of trips to a site or trips which target a particular species would be measured by the average trip-specific expenditures associated with that site or species. This measure of spending is the marginal spending per angler or per trip. This is the method we used for estimating the economic significance of sites, presented beginning on page 4-32.

A third method is to look at the actual change in fishing expenditures associated with a change in fishing conditions for existing fishermen. For example, if a regulatory change restricts fishing at some sites or for some species, fishing activity and expenditures will decline at some sites or for some species and expand at other sites or for other species. Because of this shift, the net change in expenditures will be less than the marginal change associated with any particular site or species. We used this method to estimate the incremental change in aggregate sport fishing expenditures for species and selected fisheries, using the travel cost model developed for the economic value analysis of sport fishing. Those estimates are presented beginning on page 4-39.

**Estimates of Economic Significance by Site**

The economic significance of sport angling at a particular site is a measure of the effects of the expenditures associated specifically with that site. It excludes expenditures that are related to sport fishing but that are not site specific. Most important expenditures excluded are for vehicle purchases, maintenance, and insurance, as well as general travel expenditures for visiting anglers. Expenditures made outside Alaska are also excluded.

Estimating the economic significance of a particular site in this way is a marginal analysis, as defined in the preceding section, and involves no assumptions about how anglers would shift their expenditures, if that site were closed. This should not be confused with an incremental analysis, which measures how jobs and payroll would change if site characteristics changed.

Table 4-16 shows trip-specific expenditures of resident anglers during summer 1993, by fishing zones and largest sites. (The fishing zones are ADF&G’s sport fishing management areas, as shown on Map 5-1 in Chapter 5.) Table 4-17 shows the economic significance of those trip-specific expenditures. Residents spent nearly $95 million on trip-related expenditures. After adjusting this total downward for multipurpose trips, for which only a share of expenditures could be attributable to sport fishing, we estimated that 1,222 annual average jobs and $27.381 million in payroll were associated with sport fishing sites across the state. (An annual average job is a person working year-round and is a smaller number than the number of seasonal jobs that might be created during the peak of the sport fishing season.)

About three quarters of the jobs and payroll were attributable to sites in Southcentral Alaska, which produced 924 annual average jobs and nearly $21 million of payroll. The top five sites for resident fishing were all in Southcentral Alaska, with Resurrection Bay at Seward and Kachemak Bay at Homer leading the list.
These figures represent the effects throughout Alaska of expenditures associated with Southcentral sites. The overwhelming majority of those economic effects occurred within the Southcentral region itself. The expenditure information is the trip-specific expenditure data taken directly from the survey responses of resident sport angler households. As with any survey-based calculation, the quality of the information is better for the sites with larger expenditures. A few sites show no expenditures; this is most likely because the data is from a sample, rather than because there really weren’t any expenditures at that site. The composition of expenditures varies by site. Because different categories of expenditures have different economic multipliers, the total economic significance may differ between sites that have identical levels of expenditures.

Table 4-18 shows the 1993 site-specific spending of visiting anglers, by fishing zone and largest sites. Table 4-19 shows the economic impact of that spending—again, by fishing zone and largest sites. Visiting anglers spent nearly $79 million on trip-related expenditures. We assumed for nonresidents that their trips were entirely for sport fishing and estimated that trip-related spending by visiting anglers generated 1,265 annual average jobs and $29.425 million in payroll at sites throughout Alaska.

Even though residents spent more for fishing trips than nonresidents, our estimates of economic effect are similar. That’s because we assumed some of the resident trips were multipurpose, while all the nonresident trips were strictly for fishing. If we had assumed that some nonresident trips were also multipurpose, then the nonresident economic impact would have been somewhat less than the resident economic significance. But we have no data to support an allocation of some nonresident trips to purposes other than fishing.

About half the economic impact from nonresident fishing trips was in Southcentral Alaska, 25 percent in Southeast, and the remainder in the Southwest and Northern parts of the state. The four of the five sites with the largest economic significance were in Southcentral and one in Southeast.

Table 4-20 summarizes the regional economic effects and compares the resident and nonresident location of expenditures for fishing trips. Nonresidents are clearly more important in Southeast and Southwest Alaska, while residents dominate in Southcentral. In the Interior resident spending was somewhat more important than nonresident.
Estimates of Economic Significance of Species and Selected Fisheries for Resident Sport Fishing

A fishery is defined as a species at particular sites over a particular period of time—say, for example, Kenai River late-run red salmon. The economic significance of a fishery is defined as the incremental change in jobs and payroll from the loss of that fishery. It is based on the reduction in expenditures associated with the lost species, partially offset by increased expenditures at other sites and for other species. In calculating economic significance by species, we included only trip-related expenditures and excluded other expenses that are related to sport fishing but are not tied to particular trips. That’s because any way we allocated those general sport fishing expenditures among individual species would be arbitrary.

We estimate the economic significance using the travel cost model, since it is designed to predict how sport anglers will change their behavior (number of trips, destinations, and species fished) if fishing opportunities or fishing conditions change. The model assumes that if one fishery were no longer available, some anglers would continue to fish for other species at the same sites, some anglers would substitute other sites, and some anglers would not fish.

The economic significance results by fishery and species cannot be aggregated because of the assumptions used to produce the estimates. The significance for each fishery is a measure of the incremental effect of eliminating that fishery or species from the set of alternatives available to sport anglers. Since this effect is net of the increase in expenditures on other fisheries and species, summing the individual results would underestimate the significance of closing all the fisheries simultaneously, just as summing the results for any two fisheries would underestimate the significance of simultaneous closure of both fisheries.

Since anglers’ decisions about where to fish are based on their net willingness to pay—the value they place on the site, minus their costs of fishing at the site—it is possible for net fishing expenditures to increase when a site is excluded. Were this to happen, it would be because anglers were switching to a site where the gross benefits were somewhat smaller but the cost associated with the site was slightly higher.

The definition of “trip-related expenditures” in the model and in this economic significance analysis by fishery is more inclusive than in the economic significance analysis by site, which we described in the previous section. In the model, all vehicle-related costs are included and allocated to trips. The specific expenditures included in the model (and the analysis by fishery) but excluded from the analysis by site are the purchase of new and used vehicles (boats, cars, trucks, campers, and planes), insurance, storage, and general maintenance not specifically identified with a trip. These expenditures are allocated to trips on the basis of total miles traveled or hours of travel time (for boats and planes). Thus the cost of these vehicles is allocated to trips on the basis of the share of total use associated with those trips. (This definitional difference precludes a direct comparison of trip related

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2 The model structure does not allow for substitutions to other parts of the season. All substitutions take place within the same week.
expenditures from the economic significance analysis by site with trip-related expenditures from the economic impact analysis by fishery. In addition the economic significance analysis by site is based on expenditures reported in the survey while the expenditure information for the analysis by fishery comes from the model.

Table 4-21 shows the incremental change in resident angler expenditures on sport fishing from eliminating individual species or selected fisheries as projected by the travel cost model, and the net economic significance of eliminating those fisheries, derived by using the input-output model.

The largest losses in expenditures are for large fisheries for which there are no close substitutes—for instance, halibut in Southcentral Alaska. The loss of economic activity at the site of the closed fishery would in fact be larger than reported in Table 4-21, because the net economic significance reflects increased sport fish expenditures at other sites. The results for individual species or fisheries reported in this table are not additive. In other words, the net economic significance of eliminating all king salmon fisheries would be larger than the sum of the king salmon fisheries presented here.

We cannot estimate economic significance for nonresident fishing by species for two reasons. While the travel cost model produces acceptable predictions of sport fishing trip for nonresidents, model estimates of nonresident expenditures by site are not acceptable. The root of the problem is poor expenditure data from the survey. Without good predictions of expenditures by site, we cannot estimate economic significance for the change in the distribution of trips. And without a participation equation, we cannot project changes in total expenditures by nonresidents.
Table 4-21. Incremental Significance of Resident Sport Fishing, By Species and Selected Fisheries

<table>
<thead>
<tr>
<th>Mgmt. Areas A—H</th>
<th>Species</th>
<th>Net Change in Expenditures</th>
<th>Net Economic Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Jobs</td>
<td>Payroll</td>
</tr>
<tr>
<td>Marine King</td>
<td>$8,700,772</td>
<td>107.4</td>
<td>$2,356,315</td>
</tr>
<tr>
<td>Halibut</td>
<td>$2,975,116</td>
<td>42.5</td>
<td>$1,037,630</td>
</tr>
<tr>
<td>Marine Coho</td>
<td>$330,574</td>
<td>4.6</td>
<td>$112,121</td>
</tr>
<tr>
<td>Dolly</td>
<td>$221,350</td>
<td>1.8</td>
<td>$30,518</td>
</tr>
<tr>
<td>Freshwater Coho</td>
<td>$24,202</td>
<td>0.3</td>
<td>$9,098</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mgmt. Areas I—T</th>
<th>Species</th>
<th>Net Change in Expenditures</th>
<th>Net Economic Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Jobs</td>
<td>Payroll</td>
</tr>
<tr>
<td>Halibut</td>
<td>$12,142,226</td>
<td>124.0</td>
<td>$2,888,109</td>
</tr>
<tr>
<td>Coho</td>
<td>$7,629,065</td>
<td>86.4</td>
<td>$2,019,662</td>
</tr>
<tr>
<td>Red</td>
<td>$7,767,724</td>
<td>79.0</td>
<td>$1,684,690</td>
</tr>
<tr>
<td>King</td>
<td>$5,524,565</td>
<td>56.3</td>
<td>$1,315,628</td>
</tr>
<tr>
<td>Trout</td>
<td>$4,523,586</td>
<td>42.6</td>
<td>$933,727</td>
</tr>
<tr>
<td>Dolly</td>
<td>$1,193,253</td>
<td>11.1</td>
<td>$241,546</td>
</tr>
</tbody>
</table>

| Fishery         |               |                             |                     |
| Kenai P Halibut | $8,896,324    | 82.4                        | $1,785,752          |
| W. Susitna King| $1,046,164    | 17.1                        | $467,346            |
| CI Marine Late Run King | $1,515,002 | 12.6                        | $276,931            |
| Gulkana R King | $1,364,431    | 8.1                         | $180,443            |
| Kenai R Late Run Red | $878,656 | 8.5                         | $178,856            |
| Kenai R Early Run Coho | $614,231 | 6.3                         | $127,683            |
| CI Marine Early Run King | $477,337 | 3.9                         | $86,977             |
| Kenai R Rainbow Trout | $362,965 | 4.0                         | $79,621             |
| Kenai R Late Run King | $338,786 | 3.5                         | $72,092             |
| Russian R Early Run Red | $305,706 | 2.7                         | $52,444             |
| Kenai R Early Run King | $245,897 | 2.4                         | $49,142             |
| E. Susitna King | $43,819      | 0.9                         | $17,553             |
| Ship Creek King | $29,986      | 0.0                         | $751                |

<table>
<thead>
<tr>
<th>Mgmt. Areas U-Z</th>
<th>Species</th>
<th>Net Change in Expenditures</th>
<th>Net Economic Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Jobs</td>
<td>Payroll</td>
</tr>
<tr>
<td>King</td>
<td>$4,456,419</td>
<td>28.7</td>
<td>$694,675</td>
</tr>
</tbody>
</table>

Note: Map 5-1 in Chapter 5 shows boundaries of management areas.
Comparison With Earlier Studies

1991 U.S. Fish and Wildlife Service Survey

In 1991 the U.S. Fish and Wildlife Service conducted a national survey of fishing, hunting, and wildlife-associated recreation. The survey found that Alaska residents spent $239 million on sport fishing (not all of which occurred in Alaska). This included $75 million for trip-related expenditures (of which $6 million was for guides); $24 million for fishing equipment; $10 million for auxiliary equipment (for example, camping gear, clothing, and binoculars); $65 million for special equipment (boats, canoes, trailers, and pickups, for instance); and $64 million for other fishing costs (magazine subscriptions, membership dues and contributions, and land leasing and ownership). Nonresidents spent $167 million on trip-related expenditures while in Alaska. This consisted of $46 million for food and lodging, $78 million for transportation, $39 million for privilege and other fees (primarily guiding services), and $4 million for other expenses. Total days fished were 1.8 million by residents and 982,000 by non-residents.

Because of the different categories used in this national study, it is difficult to compare its results to ours. For example, it is difficult to identify the $64 million of other fishing costs of residents. One would expect this national study to produce somewhat lower estimates of expenditures than the present study, since the national study includes only specialized transportation equipment and makes no allocation of the costs of automobiles to sport fishing.

As with many national surveys of this type, part of its value lies in its state-by-state comparative information. This study shows that, compared to the national average, a relatively small share of sport fish expenditures in Alaska are trip related. The proportion for the United States as a whole is 49 percent, while for Alaska residents it is only 31 percent. Alaska was one of only six states (the others being Montana, Delaware, Maine, New Hampshire, and Vermont) where nonresident trip-related expenditures exceeded those of residents. Alaska had the highest percentage of residents who fish but do not hunt (26 percent) and ranked fifth among the states for residents who both fish and hunt (12 percent). It had the smallest percentage of anglers who fished in other states (5 percent).

1988 Jones and Stokes Study of Sport Fishing in Southeast Alaska

A study of Southeast Alaska sport fishing done for 1988 by Jones and Stokes found that residents and nonresidents together spent $65 million in Alaska for sport fishing in the Southeast region. Residents from all regions of the state spent $40 million, and nonresidents spent $25 million, excluding the cost of travel to and from the state. This was equivalent to $2,148 per resident angler household and $798 per nonresident household. It was equivalent to $211 per household trip for residents and $279 per household fishing day for nonresidents. The total economic effect of this spending was 1,113 full-time equivalent jobs, $29 million of earnings (payroll), and $78 million in output (sales).
By contrast, we estimate total sport- fishing-related expenditures in Southeast in 1993 of $105 million, with $53 million provided by nonresidents and $52 million by residents. This is a reversal of the relative importance of the two groups since the earlier study. The total economic effect of this spending in 1993 was 1,751 annual average jobs, $39 million in payroll, and $118 million of sales.

Even if we were to net out from the present study nonresident expenditures associated with travel to Alaska (about $4 million) and the food expenditures of residents while on fishing trips (about $3 million), as the 1988 Southeast study did, we can conclude that the growth in expenditures since 1988 has been significant. In 1993 dollars, the 1988 expenditures were $79 million. This suggests a 24 percent increase in real spending over the time interval between the 1988 study and ours. (The Jones and Stokes study also included the economic effect of public management of sport fishing resources while the present study does not.)

1986 Jones and Stokes Study of Sport Fishing in Southcentral Alaska

A study of Southcentral Alaska sport fishing done for 1986 by Jones and Stokes found that $93 million was spent in Alaska related to sport fishing in the Southcentral region. Residents from all regions of the state spent $72 million and nonresidents spent $21 million, excluding the cost of travel to and from the state. This was equivalent to $677 per resident angler household and $753 per nonresident household. The economic effect of this spending was 2,840 jobs (on a full- time equivalent basis), $65 million of earnings (payroll), and $206 million in output (sales).

Although the present study is generally more inclusive of expenditures, it finds a significant increase in the economic significance of the sport fishing in Southcentral Alaska since the time of this earlier study. We estimated total sport fishing-related expenditures in Southcentral Alaska of $338 million, with $233 million provided by residents and $105 million by nonresidents. The total economic effect of this spending in 1993 was 6,100 annual average jobs, $139 million in payroll, and $433 million of sales.

Even if we were to net out from the present study the expenditures associated with travel to Alaska and vehicle purchase costs, as the 1986 Southcentral study apparently did, we can conclude that the growth in expenditures since 1986 has been significant. Furthermore, the 1988 study appears to have overestimated the economic multipliers associated with sport fishing expenditures and, consequently, overestimated their total importance for the economy.