

SOUTHCENTRAL ALASKA  
SPORT FISHING ECONOMIC STUDY

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## SUMMARY AND RESULTS

This report is organized for two audiences. This first section, "Executive Summary and Results," includes Chapters 1 through 4 and is directed to the nontechnical reader who is interested primarily in the study results and has little or no background in recreation and regional economics and modeling. The second section, "Detailed Methodology and Case Study," consists of Chapters 5 through 9 and provides details for the more technical reader concerning data collection, processing, and analytical procedures employed. The procedures and results of applying the economic models in a case study of the economic effects of closing the Kenai River to king salmon sport fishing in the last week of July are also presented in that section. References, survey forms, angler spending profiles by site, and details of the statistical models are included as separate sections.



## Chapter 1

### INTRODUCTION AND SUMMARY

#### Background

Alaska's past and future development is inextricably linked to its exhaustible and renewable resources. As the State has grown, it has become evident that careful planning is necessary to maintain and stimulate economic development, and to protect resources vital to the State's interests. Alaska's unique recreational resources provide not only visible and measurable values to the State (expenditures on food, lodging, recreational equipment, guiding) but also significant psychic values that are very important to outdoor-oriented Alaskans. In addition, many residents of all income levels depend on fishery resources for food supplement.

Despite their multi-faceted importance, little attention has been given to carefully evaluating the role that recreational resources play in Alaska. This is partly because of difficulties in placing a value on experiences such as the solace provided by a day of angling on a river, or on the food content of a salmon, trout, or halibut. Advancements in the field of recreation economics in recent years, however, have resolved some of these measurement problems. Unfortunately, these advances have been applied only to valuing non-Alaskan recreation, with little effort devoted to activities comparable to Alaska outdoor experiences.

As a consequence, important information gaps exist that result in imprecise planning and management of Alaska's recreational fisheries. Fish, wildlife, and habitat resources are widely impacted by planning and management in the State, yet little research has been conducted on patterns of use, substitution possibilities, and direct and indirect benefits that these resources generate. This study is designed to address these information gaps by examining the large and important concentration of sport fishing activities in southcentral Alaska.

The southcentral Alaska study area is roughly bounded by the Aleutian and Alaska Range to the west and north, and the Alaska Range and Wrangell Mountains to the north and east. Cook Inlet and the Gulf of Alaska bound the study area to the south. The study area is comprised of seven smaller areas, including: Glennallen area, Prince William Sound area, Knik Arm drainage area, Anchorage area, East Side Susitna drainage area, West Side Cook Inlet/West Side Susitna drainage area, and the Kenai Peninsula. These areas are shown in Figure 1-1.



The fisheries in southcentral Alaska exhibit many uniquely Alaska qualities, as well as some features addressed in studies elsewhere. Some of the unique characteristics include: the abundance and diversity of species targeted; the opportunities for both sport and personal use fishing; resident and nonresident use of the resources; the role of the guiding and tourist industry; unique recreational opportunities (e.g., the Kenai River king salmon runs of large trophy-sized fish); and use by many avid outdoors people for whom fishing is an important part of their lifestyle.

The study area also is characterized by certain classic features studied elsewhere, including access and congestion problems at sites near urban centers, and multiple substitution possibilities between sites. It is, therefore, possible to study characteristics that have not been examined previously, as well as to evaluate those features common to recreational fishing, regardless of site.

### Study Objectives

The goal of this study is to determine the economic values generated by sport fisheries in southcentral Alaska during 1986. Economic values are estimated for the following activities in southcentral Alaska: all sport fishing, all king salmon sport fishing, all halibut sport fishing, and all razor clam sport fishing. In addition, economic values are estimated (to the extent that sufficient data are available) for the specific fisheries identified in Table 1-1.

This study has two primary analytical objectives:

- 1) To estimate expenditures of sport anglers by water body fished and species sought, and the economic impact of total angler spending on sport fishing in southcentral Alaska at four levels: Kenai Peninsula, Anchorage area, rest of Alaska, and outside of Alaska; and
- 2) To estimate nonmarket values (or consumer's surplus) of sport fishing by water body fished and species sought. These values are the benefits to anglers over and above the expenditures they make to participate in sport fishing.

In addition to these primary objectives, the study also examines:

- o the factors that influence the decision to sport fish and that determine the number of sport fishing trips taken by resident anglers;

Table 1-1. Southcentral Alaska Sport Fisheries Identified as Objectives  
for Estimating Economic Values

Area/Water Body	Species	Season
<u>Glennallen Area (I)</u>		
Gulkana River	All species	Summer
Gulkana River	Grayling	Summer
Lake Louise, Susitna, Tyone	Lake Trout, Burbot	Winter
<u>Knik Arm Drainage Area (K)</u>		
Little Susitna River	King salmon	Summer
Little Susitna River	Silver salmon	Summer
Kepler Lake Complex **	Stocked rainbow trout, land-locked salmon	Year round
Big Lake	Rainbow trout	Year round
<u>Anchorage Area (L)</u>		
All Stocked Lakes (e.g. Jewel Lake)	Stocked rainbow trout, Kokanee salmon, land-locked salmon	Year round
Campbell Creek	Rainbow trout	Summer
<u>East Side Susitna Drainage Area (M)</u>		
East Susitna Roadside streams	King salmon	Summer
East Susitna Roadside streams	Silver salmon	Summer
<u>West Side Cook Inlet/</u>		
<u>Westside Susitna Drainage Area (N)</u>		
West Susitna Streams	King salmon	Summer
West Susitna Streams	Silver salmon	Summer
Lake Creek	All species	Summer
Talachulitna River	Rainbow trout	Summer
<u>Kenai Peninsula (P)</u>		
Kenai River	All species	Summer
Kenai River	Early-run king salmon	Summer
Kenai River	Late-run king salmon	Summer
Kenai River	Early-run silver salmon	Summer
Kenai River	Late-run silver salmon	Summer
Kenai River	Mainstem red salmon	Summer
Kenai River	Rainbow trout	Summer
Russian River	Early-run red salmon	Summer
Russian River	Late-run red salmon	Summer
"Lower Streams"*	King salmon	Summer
"Lower Streams" *	All species	Summer
"Lower Streams" *	Steelhead	Summer
Kachemak Bay	Halibut	Summer
Deep Creek Marine	King salmon	Summer
Deep Creek Marine	Halibut	Summer
Resurrection Bay	Silver salmon	Summer

\* Lower Kenai Peninsula Streams: Anchor River, Deep Creek, Ninilchik River, and Stariski Creek.

\*\* Kepler Lakes Complex: Kepler, Bradley, Echo, Canoe, Irene, Long, Matanuska, and Victor Lakes

- o the role that site attributes such as facilities available, crowding, and fishing conditions play in the selection of sport fishing sites;
- o the economic value of catching additional king salmon on the Kenai River; and
- o the change in economic values resulting from closing the Kenai River to king salmon sport fishing during the last week in July.

### Research Plan and Major Findings

The research was conducted in two work phases between October 1985 and September 1987. Phase 1 focused on data collection, involving primarily survey design, testing, and implementation. Intensive surveys of resident and nonresident anglers, and of sport fishing-related businesses and guides, were conducted by mail between May and December 1986 to obtain the data needed for performing the economic analyses. Phase 2 involved data analysis, including the processing of survey data and secondary information; developing analytical methods and performing the analyses, and report preparation.

The analyses show that angler expenditures associated with all sport fishing in southcentral Alaska were an estimated \$127.1 million in 1986. Resident anglers accounted for \$74.2 million, and nonresident anglers contributed \$52.9 million. King salmon sport fishing generated an estimated \$38.1 million in expenditures, with resident anglers spending more than \$16.6 million and nonresident anglers spending more than \$21.4 million. Angler expenditures associated with halibut sport fishing were \$12.6 million and \$6.0 million, respectively, by residents and nonresidents.

Angler expenditures associated with sport fishing activity in southcentral Alaska directly supported 2,178 jobs in sport fishing-related businesses in Alaska, including 781 jobs in the Anchorage area and 886 jobs in the Kenai Peninsula. The equivalent of 2,840 full-time jobs were supported in all industries in Alaska by sport fishing activity in southcentral Alaska. Total earnings in Alaska generated by sport fishing in southcentral Alaska were approximately \$65.3 million in 1986.

In addition to these market effects, it is estimated that Alaska resident anglers received an estimated \$246.4 million in surplus values from participating in sport fishing at locations in southcentral Alaska. These estimated surplus values are equivalent to the additional amount that resident anglers would be willing to pay to ensure the availability of sport fishing opportunities in southcentral Alaska. Surplus values for nonresidents associated with sport fishing at southcentral locations were an estimated \$30.4 million. Surplus values associated with king salmon sport fishing at southcentral Alaska sites



were an estimated \$17.8 million and \$8.8 million, respectively, for resident and nonresident anglers in 1986. Halibut sport fishing generated an estimated \$25.1 million in surplus values for resident (\$21.6 million) and nonresident (\$3.5 million) anglers.

For specific fisheries, the Kenai River king salmon sport fishery generated approximately \$18.7 million in angler expenditures and an additional \$11.9 million in surplus values to anglers. Halibut sport fishing at Kachemak Bay generated \$8.7 million in angler spending, with \$8.1 million in associated surplus values. The red salmon sport fishery at the Russian River generated more than \$5.2 million in angler expenditures and \$3.2 million in surplus values.

## Chapter 2

### SYNOPSIS OF DATA COLLECTION METHODS

#### Introduction

Mail questionnaires were used to survey resident and non-resident anglers, and sport fishing-related businesses and guides. The objective of these surveys was to collect data that were needed to perform the economic analyses and to profile the sport fishing industry.

A series of focus group sessions were conducted with anglers and representatives of the sport fishing industry to discuss the surveys and to formulate survey questions. Testing of specific survey questions also was accomplished at these meetings.

Once the questionnaires were initially designed, a pilot study was conducted to evaluate the survey design prior to full-scale implementation. Specifically, the pilot study allowed for: 1) testing response rates and the need for incentives, 2) evaluating the effectiveness of follow-up mailings on the response rate, 3) testing the effectiveness of specific questions, and 4) providing data for preliminary evaluation. Although conducting the pilot study during the spring months provided less-than-ideal conditions for testing, the results were encouraging and the survey design, with some modifications, was implemented.

#### Resident Angler Survey

The resident angler survey involved the administration of four mail surveys: an early season survey, a mid-season survey, an end-of-season survey, and a combined season survey.

The primary purpose of the early season survey was to identify households with fishing members who planned to fish between May and September of 1986. A survey card was sent in May to 7,500 households located in southcentral Alaska, Fairbanks, and other parts of Alaska excluding the southeast. These households were randomly selected from the State of Alaska voter registration list and from an occupancy list for the City of Anchorage.

The mid-season survey was sent in early August to respondents to the early season survey who indicated that they planned

to fish in Alaska between May and September. The objective of this survey was to collect information about sport fishing trips taken during the months of May, June, and July, and over the preceding winter (November through April).

The end-of-season survey was sent in October to respondents to the mid-season survey. This questionnaire requested information on sport fishing trips taken during August and September, and on total sport fishing-related expenditures made over the previous 12 months.

The combined season survey was mailed in October to households that received the mid-season survey but who had not responded. This questionnaire requested information on sport fishing trips taken over the entire summer period.

#### Nonresident Angler Survey

A single mail questionnaire was used to survey nonresident anglers. The sample of nonresidents that received the questionnaire included persons who had purchased a nonresident fishing license between 1983 and 1986. The questionnaire, which was mailed to 1,997 U. S. residents and 307 residents of foreign countries who were randomly selected from the state sport fishing license file, requested detailed information on the most recent trip to Alaska in which household members had sport fished.

#### Business Sector Survey

The business sector survey included an early season and an end-of-season survey. The primary purpose of the early season survey was to identify sport fishing-related businesses for follow up with the end-of-season survey. Survey cards were mailed in July to 3,785 businesses located in southcentral Alaska. The survey was intended as a complete census of all businesses believed to sell goods and/or services to anglers in southcentral Alaska. These businesses included 1) variety/department stores, 2) general sporting goods stores, 3) specialty fishing stores, 4) hotels/motels, 5) eating/drinking establishments, 6) trailer parks/campgrounds, 7) transportation businesses, 8) fish packing/processing businesses, 9) fishing camps/lodges, 10) travel/booking agents, 11) marine boat and accessory stores, 12) guide businesses, and 13) local retail food and liquor stores.

The businesses that responded to the early season survey and indicated that their business was sport fishing-related were sent in November 1986 an end-of-season questionnaire. This questionnaire requested information on the types of products offered, number of employees and payroll, capital equipment purchases, annual operating expenditures, and annual sales.

### Guide Sector Survey

As with the business sector survey, the survey of sport fishing guides included an early season and an end-of-season survey. A survey card was mailed in early May to all guides identified from lists of those who provided guiding services. The primary purpose of the early season survey was to identify sport fishing guides who expected to offer guiding services during 1986.

The end-of-season survey was mailed in November to 297 guides. With the exception of questions regarding recent guiding activities, this survey was similar to that used for the end-of-season survey of the business sector.



## Chapter 3

### PROFILE OF SPORT FISHING ACTIVITIES IN SOUTHCENTRAL ALASKA IN 1986

#### Sport Fishing Effort

During 1986, resident and nonresident anglers made approximately 1,088,900 sport fishing trips to sites within the southcentral Alaska study area (see Table 3-1). This number of trips represents an increase of about 127,600, or 13.3 percent over 1985 levels. The 1986 sport fishing effort in southcentral Alaska accounted for 66.2 percent of all sport fishing trips in Alaska, as compared with 63.1 percent in 1985 and 62.8 percent in 1984. The Kenai Peninsula accounted for 647,500 trips, or 39.4 percent of all sport fishing trips made in Alaska in 1986.

A breakdown of trips by resident and nonresident anglers to areas and sites within southcentral Alaska is shown in Table 3-2. For resident anglers, 56.7 percent of all trips were made to the Kenai Peninsula. The next most frequently visited area was the Knik Arm Drainage area, accounting for 12.0 percent of all trips made in southcentral Alaska. The percentage of trips to the other five areas was as follows: Anchorage area, 10.7 percent; West Cook Inlet - West Susitna Drainage area, 6.4 percent; East Susitna Drainage area, 5.9 percent; Prince William Sound area, 4.7 percent; and Glennallen area, 3.5 percent.

Of the site groupings in Table 3-2, the Kenai River was the fishing area most frequently visited by resident anglers, accounting for 222,740 trips or 24.0 percent of all trips made to sites in southcentral Alaska. Other fishing areas or "sites" frequently visited by resident anglers include: Anchorage area lakes (6.9 percent of all trips); Russian River (5.5 percent); Kenai Peninsula shoreline (5.2 percent); Resurrection Bay (4.5 percent); Lower Kenai Peninsula streams (4.4 percent); and Kachemak Bay (4.2 percent).

For nonresident anglers, the Kenai Peninsula accounted for an even higher proportion (75.3 percent) of sport fishing trips. The next most frequented area for sport fishing was the East Susitna Drainage area, accounting for 6.9 percent of all trips in southcentral Alaska. The percentage of trips to the other five areas was as follows: West Cook Inlet- West Susitna Drainage area, 5.3 percent; Knik Arm Drainage area, 4.1 percent; Anchorage area, 3.5 percent; Prince William Sound area, 2.7 percent; and Glennallen area, 2.1 percent.

Table 3-1. Sport Fishing Trips by Region and Area Fished  
in Southcentral Alaska

	1984		1985		1986	
	No. of Trips	Percent of Total	No. of Trips	Percent of Total	No. of Trips	Percent of Total
Southcentral Alaska						
- Glennallen Area	38,709	2.6	35,338	2.3	35,907	2.2
- Prince William Sound Area	42,331	2.9	49,157	3.2	47,735	2.9
- Knik Arm Area	117,256	7.9	108,322	7.1	118,778	7.2
- Anchorage Area	115,686	7.8	87,177	5.7	105,281	6.4
- East Susitna Drainage Area	70,043	4.7	58,061	3.8	65,880	4.0
- West Cook Inlet-West Susitna Drainage Area	51,977	3.5	59,026	3.9	67,832	4.1
- Kenai Peninsula	494,773	33.4	564,214	37.0	647,493	39.4
Subtotal	930,775	62.8	961,295	63.1	1,088,906	66.2
Southeast Alaska	258,817	17.5	286,614	18.8	293,206	17.8
Southwest Alaska	130,629	8.8	129,817	8.6	124,533	7.6
Fairbanks Area (Tanana River Drainage)	124,737	8.4	117,158	7.7	113,669	6.9
Other Alaska	38,054	2.6	29,559	1.9	24,938	1.5
TOTAL	1,483,012		1,524,443		1,645,252	

Source: Mills 1987

Table 3-2. Distribution of 1986 Resident and Nonresident Angler Trips in Southcentral Alaska, by Site

Southcentral Area/Site	Resident		Nonresident	
	Trips	Percent of Total	Trips	Percent of Total
Glennallen Area				
- Gulkana River	9,458	1.0	939	0.6
- Other	23,091	2.5	2,419	1.5
Subtotal	32,549	3.5	3,358	2.1
Prince William Sound Area	43,347	4.7	4,388	2.7
Knik Arm Drainage Area				
- Little Susitna River	36,227	3.9	3,847	2.4
- Big Lake	12,391	1.3	338	0.2
- Kepler Complex	8,756	0.9	891	0.6
- Other	54,741	5.9	1,587	1.0
Subtotal	112,115	12.0	6,663	4.1
Anchorage Area				
- Anchorage Area Lakes	64,185	6.9	4,639	2.9
- Twentymile River and Saltwater	8,186	0.9	132	0.1
- Other	27,255	2.9	884	0.5
Subtotal	99,626	10.7	5,655	3.5
East Susitna Drainage Area				
- Roadside sites (Montana Creek, Caswell Creek, Willow and Little Willow Creeks)	23,911	2.6	4,640	2.9
- Other	30,844	3.3	6,485	4.0
Subtotal	54,755	5.9	11,125	6.9
West Cook Inlet - West Susitna Drainage Area				
- Lake Creek	6,717	0.7	1,547	1.0
- Deshka River/Kroto Creek, Alexander Creek, Talachulitna River, Chuitna River, Theodore, Lewis and Ivan Rivers	34,619	3.7	5,823	3.6
- Other	17,967	1.9	1,159	0.7
Subtotal	59,303	6.4	8,529	5.3
Kenai Peninsula				
- Kenai River (lower)	117,089	12.6	23,593	14.7
- Kenai River (Soldotna Bridge to Kenai Lake)	105,651	11.4	21,321	13.2
- Russian River	50,677	5.5	14,465	9.0
- Kasilof River	23,319	2.5	8,886	5.5
- Lower Streams (Ninilchik River, Anchor River, Deep Creek)	40,656	4.4	10,124	6.3
- Other freshwater	36,900	4.0	3,875	2.4
- Deep Creek Marine	22,613	2.4	11,506	7.1
- Kachemak Bay	39,380	4.2	8,796	5.5
- Resurrection Bay, other saltwater	42,097	4.5	5,488	3.4
- Shoreline	47,856	5.2	13,201	8.2
Subtotal	526,238	56.7	121,255	75.3
TOTAL SOUTHCENTRAL TRIPS	927,933	99.9	160,973	99.9

Source: Mills 1987.



Similar to site selection for resident anglers, the site most frequently visited by nonresidents was the Kenai River, accounting for 44,914 trips or 27.9 percent of all trips in southcentral Alaska. Other sites frequently visited by nonresident anglers include: Russian River (9.0 percent of all trips); Kenai Peninsula shoreline (8.2 percent); Deep Creek Marine (7.1 percent); lower Kenai Peninsula streams (6.3 percent); Kasilof River (5.5 percent); and Kachemak Bay (5.5 percent).

The number of days fished at each site in southcentral Alaska is shown in Table 3-3. This information, when combined with the data on trips taken in Table 3-2, provides an indication of the type of trip made to each site. For example, sites in proximity to major population centers such as Anchorage generate more day trips for resident anglers whereas more distant and less accessible sites (e.g., Gulkana River and Lake Creek) generate a higher proportion of multiple day trips. This pattern can be observed in Table 3-4, which shows the average number of days fished per trip for each site.

Although this pattern is generally similar for nonresident anglers, two noteworthy exceptions are the Glennallen and Prince William Sound areas. The number of days fished per trip in these areas are lower for nonresidents than for residents, possibly suggesting that these areas are not principal destinations, but rather, are areas visited en route to primary destinations.

### Angler Characteristics

The following profile is based on data collected in the resident and nonresident angler surveys. These survey data represent Alaska and out-of-state households with members who sport fish in southcentral Alaska and therefore are used to profile the full populations from which they were drawn.

#### Resident Anglers

As shown in Table 3-5, the typical Alaska household with members who sport fish in southcentral Alaska includes 2.86 household members. Twenty-six percent (26%) of these households own or have regular access to a cabin, and 67 percent have at least one hunter in the household. Sixteen percent (16%) rate the most experienced angler in the household as a novice, and 11 percent rate this angler as an expert. Average annual expenditures on sport fishing in Alaska were \$865.78 per sport fishing household.

Tables 3-6 and 3-7 identify the preferences and motivational factors of Alaska households regarding site selection and the types of sport fishing in which to participate. Over 80 percent of households indicated that, in terms of important

Table 3-3. Distribution of 1986 Resident and Nonresident Angler Days Fished in Southcentral Alaska, by Site

Southcentral Area/Site	Resident		Nonresident	
	Days Fished	Percent of Total	Days Fished	Percent of Total
Glennallen Area				
- Gulkana River	13,197	1.1	1,022	0.5
- Other	34,719	3.0	2,625	1.3
Subtotal	47,916	4.1	3,647	1.8
Prince William Sound Area	58,218	5.0	5,062	2.5
Knik Arm Drainage Area				
- Little Susitna River	41,550	3.6	4,220	2.1
- Big Lake	14,133	1.2	426	0.2
- Kepler Complex	8,520	0.7	1,024	0.5
- Other	59,835	5.2	1,915	1.0
Subtotal	124,038	10.8	7,585	3.8
Anchorage Area				
- Anchorage Area Lakes	65,943	5.7	4,574	2.3
- Twentymile River and Saltwater	8,047	0.7	126	0.1
- Other	23,447	2.0	1,015	0.5
Subtotal	97,437	8.4	5,715	2.8
East Susitna Drainage Area				
- Roadside sites (Montana Creek, Caswell Creek, Willow and Little Willow Creeks)	33,560	2.9	6,293	3.1
- Other	43,891	3.8	8,545	4.2
Subtotal	77,451	6.7	14,838	7.4
West Cook Inlet - West Susitna Drainage Area				
- Lake Creek	13,175	1.1	2,451	1.2
- Deshka River/Kroto Creek, Alexander Creek, Talachulitna River, Chuitna River, Theodore, Lewis and Ivan Rivers	45,754	4.0	14,157	7.0
- Other	27,905	2.4	1,349	0.7
Subtotal	86,834	7.5	17,957	8.9
Kenai Peninsula				
- Kenai River (lower)	149,532	13.0	31,503	15.6
- Kenai River (Soldotna Bridge to Kenai Lake)	128,187	11.1	25,829	12.8
- Russian River	55,607	4.8	15,122	7.5
- Kasilof River	25,449	2.2	10,666	5.3
- Lower Streams (Ninilchik River, Anchor River, Deep Creek)	50,504	4.4	11,038	5.5
- Other freshwater	45,918	4.0	7,217	3.6
- Deep Creek Marine	31,973	2.8	14,814	7.4
- Kachemak Bay	49,545	4.3	11,411	5.7
- Resurrection Bay, other saltwater	59,143	5.1	5,225	2.6
- Shoreline	65,980	5.7	13,859	6.9
Subtotal	661,766	57.3	146,684	72.8
TOTAL SOUTHCENTRAL DAYS FISHED	1,153,660	99.9	201,488	100.0

Source: Mills 1987.

Table 3-4. Average Number of Days Fished Per Trip, By Site

Southcentral Area/Site	Resident Anglers	Nonresident Anglers
Glennallen Area		
- Gulkana River	1.40	1.09
- Other	1.50	1.09
Subtotal	1.47	1.09
Prince William Sound Area	1.34	1.15
Knik Arm Drainage Area		
- Little Susitna River	1.15	1.10
- Big Lake	1.14	1.26
- Kepler Complex	0.97	1.15
- Other	1.09	1.21
Subtotal	1.11	1.14
Anchorage Area		
- Anchorage Area Lakes	1.03	0.99
- Twentymile River and Saltwater	0.98	0.95
- Other	0.86	1.15
Subtotal	0.98	1.01
East Susitna Drainage Area		
- Roadside sites (Montana Creek, Caswell Creek, Willow and Little Willow Creeks)	1.40	1.36
- Other	1.42	1.32
Subtotal	1.41	1.33
West Cook Inlet - West Susitna Drainage Area		
- Lake Creek	1.96	1.58
- Deshka River/Kroto Creek, Alexander Creek, Talachulitna River, Chuitna River, Theodore, Lewis and Ivan Rivers	1.32	2.43
- Other	1.55	1.16
Subtotal	1.46	2.11
Kenai Peninsula		
- Kenai River (lower)	1.28	1.34
- Kenai River (Soldotna Bridge to Kenai Lake)	1.21	1.21
- Russian River	1.10	1.05
- Kasilof River	1.09	1.05
- Lower Streams (Ninilchik River, Anchor River, Deep Creek)	1.24	1.09
- Other freshwater	1.24	1.86
- Deep Creek Marine	1.41	1.29
- Kachemak Bay	1.26	1.30
- Resurrection Bay, other saltwater	1.40	0.95
- Shoreline	1.38	1.05
Subtotal	1.26	1.21

Source: Derived from Mills 1987.

Table 3-5. Selected Characteristics  
of Sport Fishing Households

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o Average household size	2.86 members
o Proportion of households that own or have regular access to a cabin	26%
o Proportion of households with at least one hunter	67%
o Fishing skill of most experienced angler	
- novice	16%
- intermediate	38%
- advanced	35%
- expert	11%
o Average annual expenditures on sport fishing in Alaska	\$865.78

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Table 3-6. Site Attributes Affecting Resident Anglers' Decisions  
on Where to Sport Fish

	Percent of Sport Fishing Households				
	Very Desirable (%)	Desirable (%)	No Opinion (%)	Un- desirable (%)	Very Undesirable (%)
Good chance to catch trophy-sized fish	13	44	28	12	3
Good chance to catch your limit	34	53	10	3	1
A wilderness area	24	46	23	6	2
A site of exceptional beauty	30	51	16	2	1
A site limited to fly fishing	4	12	45	26	12
A site with few other fishermen around	49	41	8	1	1
Not having to negotiate rapids or powerful currents	26	37	29	5	3
Not having to travel for a long time to the site	22	42	28	5	2
Site with fly-in access	6	20	43	20	10
Site with good boat access	17	43	29	7	4
Site with maintained road access	26	44	19	7	4

Note: Totals may not equal 100 percent due to rounding.

Table 3-7. Factors Affecting Resident Anglers' Decisions on  
the Types of Sport Fishing Trips Taken

	Percent of Sport Fishing Households				
	Definitely Yes (%)	Yes (%)	Sometimes (%)	No (%)	Definitely No (%)
When we go on a fishing trip in the summer, we usually first choose what species we want to fish for and then choose a site where that species is available.	10	34	38	15	3
When we go on a fishing trip in the summer, we usually first choose a site that we like and then fish for whatever species is available.	23	29	31	14	3
We usually go to a site near where we or friends own land or a cabin.	5	9	21	55	11
We usually go out of our way to avoid sites crowded with other fishermen.	33	31	26	10	1
We usually do catch-and-release fishing.	8	14	40	29	8
We usually take guided fishing trips.	1	1	12	56	30
We usually take float fishing trips.	1	2	22	55	19

Note: Total may not equal 100 percent due to rounding.

factors in selecting a sport fishing site, a "good chance to catch your limit," "a site of exceptional beauty," and "a site with few other fishermen around" were desirable or very desirable. Seventy percent (70%) of the households indicated that "a site with maintained road access" or "a wilderness area" were important in deciding where to fish. "Not having to travel for a long time," "not having to negotiate rapids or powerful currents," and "a site with good boat access" were desirable to 60 percent or more of households. A "good chance of catching a trophy-sized fish" was desirable to 54 percent of the households, and "fly in access" and "site limited to fly fishing" was important to 26 percent and 16 percent of the households, respectively.

As shown in Table 3-7, it appears that Alaska sport fishing households are somewhat more likely to choose a site first and then choose a species to fish for rather than first choosing a species and then a site. (This tendency is reversed, however, if anglers who regularly fish without a target species are removed.) Selecting a sport fishing site in proximity to a cabin or land owned by the household or friends is infrequent. As previously noted, crowding is an important factor in sport fishing decisions, with 66 percent of households indicating that they go out of their way to avoid crowds. Twenty-two percent (22%) of the households usually do catch-and-release sport fishing, with an additional 40 percent "sometimes" participating in this type of sport fishing. Households do not regularly take guided and float fishing trips, although a significant proportion (12 percent and 22 percent, respectively) do take these types of trips occasionally.

Table 3-8 provides an indication of the avidity of sport fishing households. Nine percent (9%) of the households indicated that they either "always" or "usually" go sport fishing after work in the summer, and an additional 38 percent responded that they go fishing after work occasionally. Fourteen percent (14%) are "seldom" or "never" busy on weekends with activities other than sport fishing. Eleven percent (11%) of the households either "always" or "usually" sacrifice some income when going sport fishing, and only 12 percent of the households would not do more sport fishing if they had more free time.

#### Nonresident Anglers

Characteristics of nonresident's sport fishing activities in Alaska between 1983 and 1986 are shown in Table 3-9. This information is presented for two groups of nonresidents who sport fished in southcentral Alaska between 1983 and 1986. As shown, the two groups demonstrate a similar pattern of activity.

The average number of trips to Alaska over the 4-year period was approximately 2.8 trips. The breakdown of trips by purpose indicates that 25 percent of the trips involved no sport

Table 3-8. Time Availability and Effects on Summer Fishing Activities

	Percent of Sport Fishing Households				
	Always (%)	Usually (%)	Sometimes (%)	Seldom (%)	Never (%)
We have to work on weekdays during the summer.	31	34	18	8	9
We can take time off on the weekdays to go fishing.	8	21	40	22	9
We go fishing after work.	2	7	38	29	25
On weekends, we are busy with activities other than fishing.	4	31	52	12	2
When we go fishing it means giving up some possible income.	3	8	22	27	40
If we had more free time, we would take many more fishing trips.	29	33	26	8	4

Note: Totals may not equal 100 percent due to rounding.



Table 3-9. Characteristics of Trips and Days Fished  
in Alaska by Nonresidents: 1983-1986

Activity	Group A <sup>1</sup>	Group B <sup>2</sup>
Average number of trips to Alaska	2.87	2.75
Percent of trips by purpose		
- without fishing	25.2%	25.1%
- primarily for fishing	36.4%	36.4%
- other purposes	38.5%	38.5%
Average number of days spent sport fishing	20.8	21.0
Percent of sport fishing days by area in Alaska		
- southeast Alaska	5.4%	5.0%
- southcentral Alaska	84.2%	84.8%
- southwest Alaska	6.8%	6.3%
- other Alaska	3.6%	4.0%

<sup>1</sup> Sample includes nonresidents who purchased a sport fishing license in Alaska sometime between 1983 and 1986 and who sport fished in southcentral Alaska during their most recent trip.

<sup>2</sup> Sample includes nonresidents who last purchased a sport fishing license in Alaska in 1986 and who sport fished in southcentral Alaska during their most recent trip.

fishing, 36 percent were taken primarily for sport fishing, and 39 percent were made for other purposes, but some sport fishing occurred.

The average number of days spent sport fishing over the 4-year period was approximately 21 days. About 84 percent of these fishing days occurred in southcentral Alaska, with the remaining days distributed relatively evenly throughout other areas of Alaska. (It should be noted that only nonresidents who sport fished in southcentral Alaska on their most recent trip are included in this profile.)

Characteristics of 1986 sport fishing trips to Alaska are shown in Table 3-10. Visiting relatives (but fished while in Alaska) was the response most frequently (35 percent) cited as the primary reason for taking the trip. Fishing was identified by 33 percent of nonresidents as the primary reason for the trip. Twenty-six percent (26 percent) of nonresidents conducted some business while in Alaska.

Regarding sources of information used to plan the trip, 45 percent consulted friends or relatives and only 13 percent used a travel or booking agent. Commercial airlines, as would be expected, was the primary mode of transportation used for the majority (69 percent) of nonresidents. Once in Alaska, 31 percent sport fished at only one site, and only 15 percent sport fished at more than four sites. Twenty-six percent of nonresidents used guide services to sport fish in Alaska.

The factors important to nonresidents in deciding where to sport fish in Alaska are shown in Table 3-11. The two most important factors were the availability of particular species and a good chance of catching the desired species. Factors of somewhat less importance were "ease of access," catching a trophy-sized fish, and crowding. Factors relatively unimportant to the majority of nonresidents include the availability of a package tour, the type of lodging and restaurant facilities available, the availability of guiding services, and the availability of campground or cabin facilities.

#### Sport Fishing-Related Businesses

Expenditures in Alaska associated with all sport fishing in southcentral Alaska exceeded \$93 million in 1986. That spending directly supported nearly 800 jobs in the Anchorage area, almost 900 jobs in the Kenai Peninsula, and more than 500 jobs elsewhere in Alaska (details of these and other economic impacts are given in Chapter 4). The greatest portion of these jobs, about 35 percent, are in retail establishments, including variety, sporting goods, grocery, and specialty fishing shores. Other businesses affected by angler spending are sport fishing guides, hotels and other lodging places, transportation services firms, travel agencies, marine/boat stores, and eating and drinking

Table 3-10. Characteristics of Trips by Nonresidents Who Sport Fished in Southcentral Alaska During 1986

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Primary reason for trip?

o to fish	33%
o to hunt, fished while in Alaska	5%
o for business, fished while in Alaska	14%
o to visit relatives, fished while in Alaska	35%
o other, fished while in Alaska	14%

Conducted business while in Alaska?

yes - 26%                      no - 74%

Sources of information used to plan trip

o travel/booking agents	13%
o friends/relatives	45%
o magazines/books	17%
o previous experience	19%
o other	6%

Primary mode of transportation used to get to Alaska?

commercial airline	- 69%	camper/RV	-13%
private airline	- 1%	truck	- 4%
ferry	- 2%	car	- 5%
private boat	- <1%	van	- 3%
cruise ship	- 1%	other	- 2%
railroad	- 0		

Number of fishing sites visited

one - 31%	three - 20%	more than four - 15%
two - 23%	four - 11%	

Use of guide services?

yes - 26%                      no - 74%

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Table 3-11. Important Factors to Nonresidents in Deciding  
Which Alaska Fishing Sites to Visit in 1986

Factors	Percentage of Households				
	Extremely Important (%)	Very Important (%)	Somewhat Important (%)	Not at All Important (%)	Unsure (%)
Availability of a package tour	4	5	9	76	6
Availability of a particular species (e.g., king salmon, rainbow trout)	35	38	12	14	1
Likelihood of catching the desired species	37	39	15	9	<1
Likelihood of catching a trophy- sized fish	17	15	30	36	1
Ease of access to site (e.g., road)	16	27	29	27	1
Type of lodging and restaurant facilities available	6	8	30	54	2
Availability of guiding services	13	13	14	57	4
Availability of campground/cabin facilities	15	15	20	48	3
Degree of crowding expected at the fishing sites	20	24	37	19	<1

places. Altogether, the income generated directly by these expenditures exceeded \$18.2 million in 1986.

This profile focuses on the following information about the different categories of sport fishing-related businesses in southcentral Alaska noted above:

- o employment characteristics
- o annual sales characteristics
- o expenditure characteristics
- o products and services characteristics

*Employment characteristics* include the number of persons employed by various types of businesses, a total payroll estimate for each business, and the percentage of labor that is supported by sport fishing. *Annual sales characteristics* include gross sales, the percentage of sales that was generated by sport fishing activities, and the percentage of sport fishing sales generated from different products and services. *Expenditure characteristics* indicate the amount of money spent by businesses on operations and sport fishing-related capital equipment. *Products and services characteristics* include information about the various goods and services offered by the different types of businesses.

Following the business profile is a profile of sport fishing-related guide businesses. The guide profile is based on data from a similar survey of sport fishing guides. Some businesses responding to the business sector survey identified themselves as primarily a guide business. Because these businesses indicated that less than 50 percent of their revenues came from providing guide services to anglers, they were included in the business profile. The guide profile therefore includes only guide businesses that are primarily sport fishing-related.

#### Employment Characteristics

Employment levels for the sport fishing-related businesses ranged from none (indicating an owner-operated business with no employees) to more than 250 workers. Table 3-12 shows that for all businesses, there was an average of 5.4 workers. The largest average number of employees was reported by variety/department stores and hotel/motel businesses. Both business types averaged over 16 employees per firm. Transportation service businesses and respondents that classified their business as either a multiple business type or as no business type employed an average of between 6.5 and 8.8 workers. All other business types averaged fewer than 5 employees. Specialty

Table 3-12. Businesses' Employment Characteristics

Business Type	Average Number of Employees	Average Total Payroll (\$)	Average Percentage of Labor Related to Sport Fishing (%)
Variety/Department Store	17.5	200,667	13.3
General Sport Goods	4.2	50,489	68.0
Specialty Fishing Store	0.9	4,800	100.0
Hotel/Motel	16.4	115,243	17.4
Eating/Drinking Establishment	2.5	27,400	5.0
Trailer Park/Campground	2.0	2,796	98.0
Transportation Services	8.8	64,216	47.1
Fishing Lodge/Camp	4.0	20,948	85.9
Travel/Booking Agent	2.8	2,375	63.3
Marine/Boats/Accessories	2.6	23,450	70.0
Guide Services	1.1	6,140	57.3
Retail Food/Liquor Store	1.7	24,700	37.5
Other Business Type	1.5	11,415	30.1
Multiple Business Types	6.5	59,453	69.8
No Business Type Identified	<u>8.6</u>	<u>47,320</u>	<u>30.0</u>
Average, All Businesses	5.4	\$ 42,223	56.3%

Note: The total number of businesses providing responses to the survey are reported, by business type, in Chapter 7, Table 7-12.

fishing stores had an average number of employees of less than one, which indicates that many of these types of businesses are probably owner-operated with very few or no employees.

Payrolls were reported to range as high as \$1.2 million, with the average payroll for all businesses at \$42,223. For variety/department stores, reported payroll averaged \$200,667. The average payroll for hotels/motels was \$115,243. The average payroll per worker for all businesses is less than \$8,000. Some of the business types have a very low average payroll per worker because of the seasonal nature of the work.

A large percentage of the labor reported is related to sport fishing activity. On average, 56 percent of the labor is supported by sport fishing clientele. The largest percentage of sport fishing-related labor was reported by specialty fishing stores. Approximately 86 percent of the employees at fishing lodges/camps are supported by sport fishing clientele. All other businesses, except variety/department stores and hotels/motels, attributed greater than 30 percent of their employment to sport fishing activity.

#### Annual Sales Characteristics

Total sales during the 1985/86 season (November through September) by business type ranged between \$0 and \$70 million. The average sales for the 14 types of businesses are shown in Table 3-13. Average sales related to sport fishing, based on information regarding the percentage of total sales related to sport fishing, are also shown in the table. Some business types are very dependent on sport fishing. The percentage of total sales related to sport fishing varied between 1.8 and 100 percent. The largest percentage of sport fishing-related sales were reported by the following services: trailer park/campground, 100 percent; specialty fishing store, 70 percent; and fishing lodge/camp, 62 percent. Of the approximately 3 percent of businesses that did not identify themselves as a particular business type, 76 percent of their sales are related to sport fishing. Sport fishing-related sales averaged over \$80,000 for businesses located in southcentral Alaska.

Businesses were also asked to identify the percentages of sport fishing sales that were generated by various products and services (i.e., fishing tackle/bait, food and beverages, transportation). The results are shown in Table 3-14. Of the eight choices available, four products and services generated almost equal amounts of revenue for businesses. These include: fishing tackle/bait, 18 percent; guiding activities, 17 percent; transportation, 16 percent; and lodging, 15 percent.

Table 3-13. Businesses' Sales Characteristics

Business Type	Average Annual Sales	Weighted Average Percentage of Total Sales Related to Sport Fishing	Average Annual Sales Related to Sport Fishing
Variety/Department Store	\$1,171,829	6.9%	\$ 80,361
General Sport Goods	1,456,444	15.7	227,971
Specialty Fishing Store	40,049	70.3	28,141
Hotel/Motel	592,357	16.9	99,826
Eating/Drinking Establishment	170,000	1.8	3,000
Trailer Park/Campground	11,737	100.0	11,737
Transportation Services	181,422	21.8	39,541
Fishing Lodge/Camp	121,325	61.7	74,828
Travel/Booking Agent	325,800	40.9	133,300
Marine/Boats/Accessories	738,938	36.8	271,605
Guide Services	24,600	21.5	5,300
Retail Food/Liquor Store	166,381	29.1	48,375
Other Business Type	105,296	24.2	25,480
Multiple Business Types	4,630,263	3.3	154,539
No Business Type Identified	<u>26,588</u>	<u>76.1</u>	<u>20,237</u>
Average, All Businesses	\$ 683,670	11.7%	\$ 80,055



Table 3-14. Percentage of Sport Fishing Sales Generated  
by Various Products and Services

Products and Services (see list below)

Business Type	A (%)	B (%)	C (%)	D (%)	E (%)	F (%)	G (%)	H (%)
Variety/Department Store	49	49	2	0	0	0	0	0
General Sport Goods	83	9	2	0	0	0	3	3
Specialty Fishing Store	52	16	3	0	0	0	0	22
Hotel/Motel	0	0	26	63	11	0	0	0
Eating/Drinking Establishment	0	0	100	0	0	0	0	0
Trailer Park/Campground	2	0	4	0	48	0	0	46
Transportation Services	3	0	0	8	5	60	12	11
Fishing Lodge/Camp	1	0	2	39	9	4	43	2
Travel/Booking Agent	0	0	0	20	0	27	17	37
Marine/Boats/Accessories	11	4	1	0	1	22	3	58
Guide Services	1	0	1	15	1	15	61	7
Retail Food/Liquor Store	18	3	55	0	0	0	0	24
Other Business Type	35	10	12	0	15	0	0	28
Multiple Business Types	19	8	16	21	6	9	16	6
No Business Type Identified	34	0	0	33	0	0	0	33
Average, All Businesses	18%	5%	8%	15%	5%	16%	17%	14%

A = Fishing tackle/bait

B = Other fishing gear

C = Food and beverages

D = Lodging including meal packages

E = Equipment rental

F = Transportation (other than guiding services)

G = Guiding activities

H = Other (e.g., entertainment for fishing parties; commissions on guiding services and travel)

### Expenditure Characteristics

The majority of business expenses are for operation, which are detailed by business location in Table 3-15. Operations costs include payments on owned or leased property, other rental and lease payments, utility costs, motor fuel expenses, maintenance and repair costs, costs for inventory, office supplies, insurance, transportation and freight, taxes, licenses, permits, professional services, and advertising.

Average annual expenditures for sport fishing-related capital items by businesses in southcentral Alaska are shown in Tables 3-16 through 3-18. The majority of capital expenses for most businesses is for transportation equipment (Table 3-16). For many businesses, transportation equipment includes trucks or vans to transport products or clients. Some businesses, particularly transportation service firms and guide services, also have power boats, rafts, campers, and airplanes to provide special transportation services to their clientele. Fishing equipment is the next largest capital expense for businesses, whereas a smaller percentage is invested in other types of equipment, including office equipment such as computers, typewriters, and office furnishings. Expenditures for fishing equipment and other equipment are shown in Tables 3-17 and 3-18, respectively.

The largest proportion of sport fishing-related transportation equipment is procured in the Anchorage area. Approximately 44 percent of the expenditures for transportation equipment was purchased in the Anchorage area. Nineteen percent was spent in the Kenai Peninsula area and 19 percent was spent outside of Alaska. Only 2 percent of transportation procurement expenses were made in the Juneau area, and the remaining 16 percent was spent in other areas of Alaska.

As might be expected, transportation service firms have the highest average annual transportation equipment expenditures among the 14 business types listed in Table 3-16. Expenditures by transportation service firms averaged over \$58,000, whereas the next highest average expenditure level was \$13,952, reported by fishing lodges/camps. Specialty fishing stores, transportation services, and firms selling marine equipment, boats, and accessories made 44, 33, and 23 percent, respectively, of their transportation equipment expenditures outside the state.

Variety/department stores reported the largest amount of sport fishing-related fishing gear/equipment procurement. Average annual expenditures of variety/department stores were over \$250,000, which is nearly five times the average amount for any other business type. (It is possible that one or more of the variety/department stores reporting expenditures may have mistakenly reported their inventory of fishing-related equipment rather than their capital investment in goods to service anglers.)

Table 3-15. Summary of Annual Operations Spending, by Business Location

Spending Area	Average Annual Operations Expenditures		
	Anchorage Area Addresses	Kenai Peninsula Addresses	Addresses Elsewhere in Southcentral Alaska
Anchorage Area	\$169,613	\$ 46,148	\$ 55,339
Kenai Peninsula	3,818	51,515	386
Juneau Area	218	1,565	22
Other Alaska	56,177	192	41,355
Outside Alaska	<u>62,647</u>	<u>52,164</u>	<u>18,491</u>
TOTAL	\$228,228	\$163,405	\$106,895

Table 3-16. Summary of Sport Fishing-Related Capital Expenditures by Area  
for Transportation-Related Equipment

Business Type	Average Annual Expenditures	Percentage of Spending by Area				
		Anchorage Area (%)	Kenai Peninsula (%)	Juneau Area (%)	Other Alaska (%)	Outside Alaska (%)
Variety/Department Store	\$ 0	N/A	N/A	N/A	N/A	N/A
General Sport Goods	412	67	0	0	33	0
Specialty Fishing Store	1,247	0	39	0	17	44
Hotel/Motel	1,653	52	33	6	8	0
Eating/Drinking Establishment	445	100	0	0	0	0
Trailer Park/Campground	0	N/A	N/A	N/A	N/A	N/A
Transportation Services	58,285	32	25	5	5	33
Fishing Lodge/Camp	13,952	59	12	0	17	12
Travel/Booking Agent	387	100	0	0	0	0
Marine/Boats/Accessories	5,401	34	30	0	13	23
Guide Services	2,854	44	15	0	24	16
Retail Food/Liquor Store	1,488	50	50	0	0	0
Other Business Type	307	44	0	0	44	11
Multiple Business Types	10,178	54	10	0	16	19
No Business Type Identified	16,195	33	33	0	33	0
Average, All Businesses	\$15,079	44%	19%	2%	16%	19%

Table 3-17. Summary of Sport Fishing-Related Capital Expenditures by Area  
for Other Equipment

Business Type	Average Annual Expenditures	Percentage of Spending by Area				
		Anchorage Area (%)	Kenai Peninsula (%)	Juneau Area (%)	Other Alaska (%)	Outside Alaska (%)
Variety/Department Store	\$14	0	0	0	0	100
General Sport Goods	59	50	0	0	25	25
Specialty Fishing Store	601	55	28	0	2	15
Hotel/Motel	2,752	38	50	0	0	13
Eating/Drinking Establishment	1,452	N/A	N/A	N/A	N/A	N/A
Trailer Park/Campground	0	N/A	N/A	N/A	N/A	N/A
Transportation Services	1,677	64	19	0	6	11
Fishing Lodge/Camp	2,089	42	15	0	20	23
Travel/Booking Agent	787	100	0	0	0	0
Marine/Boats/Accessories	756	21	36	0	20	23
Guide Services	260	62	3	0	19	16
Retail Food/Liquor Store	693	40	46	0	15	0
Other Business Type	206	58	25	0	17	0
Multiple Business Types	3,016	77	21	0	0	2
No Business Type Identified	<u>1,154</u>	<u>17</u>	<u>17</u>	<u>0</u>	<u>33%</u>	<u>33</u>
Average, All Businesses	\$1,234	55%	19%	0%	12%	15%

Table 3-18. Summary of Sport Fishing-Related Capital Expenditures by Area  
for Fishing Gear/Equipment

Business Type	Average Annual Expenditures	Percentage of Spending by Area				
		Anchorage Area (%)	Kenai Peninsula (%)	Juneau Area (%)	Other Alaska (%)	Outside Alaska (%)
Variety/Department Store	\$250,125	30	0	0	0	70
General Sport Goods	728	51	0	0	29	20
Specialty Fishing Store	38,067	32	0	0	20	48
Hotel/Motel	52,216	67	33	0	0	0
Eating/Drinking Establishment	NA	NA	NA	NA	NA	NA
Trailer Park/Campground	1,000	100	0	0	0	0
Transportation Services	3,336	64	21	0	8	11
Fishing Lodge/Camp	2,341	6	14	0	14	12
Travel/Booking Agent	10,300	100	0	0	0	0
Marine/Boats/Accessories	1,530	47	38	0	0	15
Guide Services	1,437	66	10	0	20	4
Retail Food/Liquor Store	1,200	58	5	0	38	0
Other Business Type	1,294	38	25	0	38	0
Multiple Business Types	4,561	76	13	0	3	13
No Business Type Identified	5,000	50	0	0	50	0
Average, All Businesses	\$9,457	61%	15%	0%	14%	12%

The overall average spending by all businesses on fishing equipment averaged \$9,457. Approximately 61 percent of the expenditures for fishing equipment was purchased in the Anchorage area. Fifteen percent was spent in the Kenai Peninsula and 12 percent was spent outside of Alaska. No fishing equipment procurement expenses were reported in the Juneau area, and the remaining 14 percent was spent in other areas of Alaska.

Following variety/department stores, hotel/motels had the highest average annual fishing equipment expenditures among the 14 business types listed in Table 3-18. Expenditures by specialty fishing stores averaged over \$38,000, whereas the next highest average expenditure level was \$10,300, reported by travel/booking agents. The majority of other equipment related to sport fishing is procured in the Anchorage area. Approximately 55 percent of the expenditures for other equipment was purchased in the Anchorage area, 19 percent was spent in the Kenai Peninsula, and 15 percent was spent outside of Alaska. No procurement expenses for other equipment was reported in the Juneau area, and the remaining 12 percent was spent in other areas of Alaska.

Firms which classified themselves as a multiple business type and hotels/motels spent the highest average annual expenditures for other equipment. Expenditures by firms of multiple business types averaged over \$3,000, whereas hotels/motels reported annual average spending of \$2,752. Variety/department stores reported annual average expenditures of only \$14, which is less than would be expected for firms which reported the largest average employment and payroll levels.

### Products and Services Characteristics

Table 3-19 provides some insight into the products that are provided by different types of businesses. The table indicates that the most commonly provided item out of the 14 alternative choices was fishing gear and equipment. Over 49 percent of the firms indicated that they provided fishing gear and equipment. The next most commonly provided service was boat/airplane transportation, with 42 percent of the firms providing such service. The majority of firms providing this type of service were either transportation service, guide service, or fishing lodge/camp businesses. These types of businesses comprise a relatively large proportion of sport fishing-related businesses, which may be why this (and other) goods and services are ranked in this manner. Guiding services, food and beverages, lodging, and boating equipment are the next four most common goods and services provided. Between 33 and 40 percent of the firms provided these types of goods and services. Fish mounting and taxidermy was the least common service provided, with less than 3 percent of the businesses indicated that they provided this service to their clientele.

Table 3-19. Percentage of Businesses by Type, Supplying Various Goods and Services

Business Type	Goods and Services (see list below)													
	A (%)	B (%)	C (%)	D (%)	E (%)	F (%)	G (%)	H (%)	I (%)	J (%)	K (%)	L (%)	M (%)	N (%)
Variety/Department Store	38	63	50	25	--	75	--	--	--	--	--	--	--	13
General Sport Goods	36	82	64	18	--	91	9	--	--	--	--	9	9	18
Specialty Fishing Store	25	17	17	8	17	92	33	8	--	17	17	17	--	8
Hotel/Motel	13	--	--	40	93	--	7	7	--	--	--	--	--	13
Eating/Drinking Establishment	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trailer Park/Campground	--	--	--	--	--	100	--	--	--	--	--	100	--	--
Transportation Services	26	10	2	12	24	40	36	81	10	10	5	10	5	7
Fishing Lodge/Camp	46	31	4	73	92	65	85	69	15	15	--	23	19	4
Travel/Booking Agent	--	--	--	--	40	--	40	40	40	--	--	20	--	60
Marine/Boats/Accessories	86	--	29	7	--	14	7	21	7	--	--	14	--	21
Guide Services	52	27	6	42	36	58	94	67	15	12	--	6	12	6
Retail Food/Liquor Store	17	17	17	83	--	50	--	--	--	--	--	--	33	50
Other Business Type	19	10	14	29	--	43	--	5	--	--	5	--	24	38
Multiple Business Types	26	16	21	74	63	63	58	53	11	11	5	32	21	11
No Business Type Identified	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Average, All Businesses	34	20	13	35	35	49	40	42	8	7	3	11	10	14

A - Boating equipment and accessories  
 B - Hiking and camping supplies  
 C - Clothing  
 D - Food and beverages  
 E - Lodging  
 F - Fishing gear and equipment  
 G - Guiding services  
 H - Boat/airplane transportation  
 I - Other transportation  
 J - Fish packing/processing  
 K - Fish mounting/taxidermy  
 L - Fishing equipment rental  
 M - Motor fuel  
 N - Other



In conclusion, sport fishing-related businesses generally provide a wide variety of goods and services. Firms categorizing themselves as multiple businesses, transportation services firms, guide services, and fishing lodges/camps seem to be the most diversified; however, these business types also comprised the largest group of businesses.

### Sport Fishing Guide Businesses

Employment in guide businesses directly attributable to angler expenditures associated with sport fishing in south-central Alaska exceeded 350 jobs in 1986. More than 90 percent of these jobs accrued to guides operating in the Kenai Peninsula area, where sport fishing guides sold \$5 million worth of services to anglers that year. About \$1.4 million in income was generated directly by these 1986 expenditures.

This profile focuses on the following information regarding sport fishing guide businesses:

- o employment characteristics
- o annual sales characteristics
- o expenditure characteristics
- o service characteristics

*Employment characteristics* include the number of persons employed by guide businesses, the number of person-months worked by those employees, a total payroll estimate, and the percentage of person-months of labor that is related to sport fishing. *Annual sales characteristics* include gross sales, the percentage of sales that was generated from sport fishing products and services, and the average charge for different types of guide services. *Expenditure characteristics* indicate the amount of money spent by guides for capital equipment and operations. *Service characteristics* include information about the operation of the guide businesses. This information includes a description of the average number of days per month service was provided to sport fishing clientele, the percentage of sport fishing guide activities in various areas, and the number of sport fishing-related trips per day by different transportation modes.

Much of the information in this profile is presented by business location. Guide businesses are grouped into three areas by mailing address; Anchorage area, Kenai Peninsula, and other areas of southcentral Alaska. Three of the businesses in the sample had mailing addresses in other areas of Alaska and three had mailing addresses outside the state. Responses from these guide businesses are included in the information for all

businesses, but are not included in the summaries for the Anchorage, Kenai, or other southcentral Alaska areas.

### Employment Characteristics

Employment levels in the guide businesses ranged from none (indicating an owner-operated business with no employees) to 181 workers. Five percent of the businesses indicated that they employed more than 12 workers. Those businesses have mailing addresses (and therefore are presumably based) in the Anchorage area and Kenai Peninsula. Table 3-20 shows that for all businesses, the average number of employees was more than three in the Anchorage and Kenai areas, whereas the average number of employees for all businesses in other areas of southcentral Alaska was less than one. Most of these guide businesses employed no more than one worker, but the five percent of businesses with more than 11 employees brought the average up in the Anchorage area and Kenai Peninsula. The average number of employees for those businesses with 11 or fewer employees was 1.3 in the Anchorage area and 0.9 in the Kenai area. The average for the five percent of businesses with more than 11 employees was 33.4 workers.

Job lengths ranged between 1 and 4.5 months for guides with mailing addresses in the Anchorage area, between 1 and 12 months for guides in the Kenai Peninsula, and between 2 and 9 months for guides in other areas of southcentral Alaska. The average job length reported by guide businesses in each of the three areas was between 2.4 and 4.5 months. For the five percent of guide businesses with more than 11 employees, job lengths ranged between 1 and 4.5 months, and the average job length was 2.9 months.

For all guide businesses, reported payroll ranged as high as \$307,000 in the Anchorage area, \$406,000 in the Kenai Peninsula, and \$12,000 in other areas of southcentral Alaska. The average payroll for all guide businesses was \$20,354 in the Anchorage area, \$21,758 in the Kenai Peninsula, and \$2,263 in other areas of southcentral Alaska. For those businesses with 11 or fewer employees, reported payroll ranged up to \$28,000 in the Anchorage area and as high as \$140,000 in the Kenai Peninsula. The average payroll for businesses with 11 or fewer employees was much lower in the Anchorage area and Kenai Peninsula -- \$3,308 in Anchorage and \$6,133 in the Kenai Peninsula. The average payroll for the large guide businesses was \$201,600.

A large percentage of the labor employed is related to sport fishing activity. Eighty percent of the labor reported by the large guide businesses is supported by sport fishing clientele. In the Kenai Peninsula 98 percent of the guide business labor is attributed to sport fishing. In the Anchorage area and other areas of southcentral Alaska, the percentage of sport fishing-related labor is slightly lower -- 75 percent in Anchorage and 52 percent in other southcentral Alaska.

Table 3-20. Employment Characteristics of Guide Businesses

Businesses With More Than 11 Employees

	<u>Average Number of Employees</u>	<u>Average Job Length (# of months/yr)</u>	<u>Average Total Payroll</u>	<u>Average Percent of Labor Related to Sport Fishing</u>
Total	33.4	2.9	\$201,600	80%

Businesses With 11 Or Fewer Employees

	<u>Average Number of Employees</u>	<u>Average Job Length</u>	<u>Average Total Payroll</u>	<u>Average Percent of Labor Related to Sport Fishing</u>
Anchorage Area	1.3	2.1	\$3,308	77%
Kenai Peninsula	0.9	3.3	\$6,133	98%
Other Alaska	0.5	4.5	\$2,263	62%

All Businesses

	<u>Average Number of Employees</u>	<u>Average Job Length</u>	<u>Average Total Payroll</u>	<u>Average Percent of Labor Related to Sport Fishing</u>
Anchorage Area	3.7	2.4	\$20,354	75%
Kenai Peninsula	3.2	3.3	\$21,758	98%
Other Alaska	0.5	4.5	\$2,263	62%

### Annual Sales Characteristics

Total sales during the 1985/86 season ranged between \$1,320 and \$2 million for businesses with mailing addresses in the Anchorage area, between \$1,440 and \$820,000 for businesses in the Kenai Peninsula, and between \$0 and \$90,000 for businesses in other areas of southcentral Alaska. The average sales for guide businesses in each of these areas is shown in Table 3-21. Average sales related to sport fishing are also shown in the table, based on information regarding the percentage of total sales related to sport fishing. As shown, all guide businesses are very dependent on sport fishing. The percentage of total sales related to sport fishing averaged between 74 and 99 percent. The largest percentage of sport fishing-related sales was reported by businesses located in the Kenai Peninsula. Sport fishing-related sales averaged \$91,130 for guide businesses located in the Anchorage area, \$74,882 for guide businesses located in the Kenai Peninsula, and \$17,947 for guide businesses located in other areas of southcentral Alaska.

The average charge for different types of services offered by guide businesses is shown in Table 3-22. Multiple day trips are, as would be expected, more expensive than any of the day trips available. Prices for accompanied day trips ranged between \$38 and \$475 per person and averaged \$121. Only 41 percent of the guide businesses provided information on the price of an accompanied multiple day trip, which suggests that fewer guides provide the multiple day service. The price for the multiple day service ranged from \$40 to \$4,000 and averaged \$706.

Guides also indicated prices for three different types of unaccompanied trips: 1) trips to a client-specified location, 2) day trips to a guide service camp or location, and 3) multiple day trips to a guide service camp or location. Only 12 percent of the guide businesses provided price information for the first type of unaccompanied trip, 6 percent provided the data for the second type, and 5 percent provided the information for the third type. This response indicates that either these types of trips are not often requested by clients, and that no set price has been established by the guides, or most guides do not provide these types of services.

Table 3-22 also indicates the differences in average prices charged for services by guides in different locations. The largest price variance among the three areas is for multiple day trips. This variance may be due to different lengths of multiple day trips.

### Expenditure Characteristics

Average annual expenditures by guide businesses in the Anchorage area, Kenai Peninsula, and other areas of southcentral

Table 3-21. Sales Characteristics of Guide Businesses

	Average Annual Sales	Weighted Average Percentage of Total Sales Related to Sport Fishing	Average Annual Sales Related to Sport Fishing
Anchorage area	\$123,712	73.7%	\$91,130
Kenai Peninsula	\$ 75,956	98.6%	\$74,882
Other Southcentral Alaska	\$ 22,118	81.1%	\$17,947

Table 3-22. Average Per Person Per Trip Charge for Guide Services

	Average All Guides	Mailing Address of Guide		
		Anchorage Area	Kenai Peninsula	Other Southcentral Alaska
Accompanied day trips	\$121	\$ 148	\$112	\$104
Accompanied multiple day trips	706	1,196	386	587
Unaccompanied trips (drop off) <sup>1</sup>	142	108	153	153
Unaccompanied day trips <sup>2</sup>	138	100	90	230
Unaccompanied multiple day trips <sup>3</sup>	362	375	600	230

<sup>1</sup> To client selected location; only 12 percent of the businesses provided responses for this particular service.

<sup>2</sup> To guide service camp or location; only 6 percent of the businesses provided responses for this particular service.

<sup>3</sup> To guide service camp or location; only 5 percent of the businesses provided responses for this particular service.

Alaska are shown in Table 3-23. The majority of the expenses are for operations, including payments on owned or leased property, other rental and lease payments, utility costs, motor fuel expenses, maintenance and repair costs, costs for inventory, office supplies, insurance, transportation and freight, taxes, licenses, permits, professional services, and advertising. Anchorage-based guide businesses reported average annual operating expenses of \$74,218, more than double the amount for Kenai Peninsula-based firms and more than triple the amount for businesses with mailing addresses in other areas of southcentral Alaska. Between 57 and 65 percent of operating expenditures are spent in the same area that the business is located. Between 16 and 21 percent of the operating expenses are spent outside Alaska.

The majority of capital expenses for most of the guide businesses is for transportation equipment that includes trucks or vans to transport clients, as well as power boats to provide access to ocean and freshwater fishing areas. Some guides also have rafts, campers, and airplanes to provide special transportation services for their clientele. Fishing equipment is the next greatest capital expense for guide businesses, whereas a smaller percentage is invested in other types of equipment, including office equipment such as computers, typewriters, and answering machines.

Guide businesses in the Anchorage area spent more for transportation-related and other equipment than guides in Kenai Peninsula and other areas of southcentral Alaska. The guide businesses in the Kenai Peninsula and other southcentral Alaska spent almost double the amount of money on fishing gear/equipment than the Anchorage-based firms. The majority of transportation equipment is purchased within the areas that the businesses are based. These local purchases account for between 48 and 54 percent of transportation equipment expenditures in the three areas. A large proportion of transportation-related equipment is procured outside of Alaska. Between 21 and 47 percent of the expenditures for transportation equipment was purchased outside Alaska. Lower prices for this type of equipment help explain these out-of-state purchases.

The majority of expenditures for other equipment and fishing gear was also made within the area where the business is located. Businesses with mailing addresses in other areas of southcentral Alaska spent a majority of their capital expenses for other equipment and fishing gear in the Anchorage area.

### Service Characteristics

Sport fishing guide activities were concentrated in the Kenai Peninsula. Table 3-24 shows that over 62 percent of the guide businesses had trip destinations to the Kenai Peninsula. The next two most popular areas are "other Alaska" and the West

Table 3-23. Summary of Guide Expenses by Business Location and Area of Spending

Operating Expenses	Mailing Address of Guide		
	Anchorage Area	Kenai Peninsula	Other Southcentral Alaska
Average Annual Expenses	\$74,218	\$32,758	\$18,963
Spending in Anchorage area	57%	18%	14%
Spending in Kenai Peninsula	15%	64%	0%
Spending in Juneau area	0%	0%	0%
Spending in Other Alaska	7%	1%	65%
Spending Outside Alaska	21%	16%	20%
Capital Equipment Expenses			
Average Annual Capital Expenses for Transportation-Related Equipment	\$15,208	\$8,834	\$6,418
Spending in Anchorage area	50%	10%	31%
Spending in Kenai Peninsula	3%	54%	0%
Spending in Juneau area	0%	0%	0%
Spending in Other Alaska	0%	4%	48%
Spending Outside Alaska	47%	31%	21%
Expenses for Other Equipment	\$2,238	\$1,608	\$ 593
Spending in Anchorage area	68%	18%	78%
Spending in Kenai Peninsula	10%	53%	0%
Spending in Juneau area	0%	0%	0%
Spending in Other Alaska	17%	0%	15%
Spending Outside Alaska	5%	29%	7%
Expenses for Fishing Gear/Equipment	\$2,553	\$4,495	\$4,609
Spending in Anchorage area	81%	15%	48%
Spending in Kenai Peninsula	6%	57%	1%
Spending in Juneau area	0%	0%	0%
Spending in Other Alaska	0%	0%	25%
Spending Outside Alaska	13%	25%	26%



Table 3-24. Percentage of Sport Fishing Guide Activities  
by Destination Area

Destination Area	All Guides (%)	Mailing Address of Guide		
		Anchorage Area (%)	Kenai Peninsula (%)	Other Southcentral Alaska (%)
Glennallen	1.0	0.0	0.0	5.0
Prince William Sound	3.8	2.2	0.2	1.5
Knik Arm Drainage	0.0	0.0	0.0	0.0
Anchorage	0.1	0.4	0.0	0.0
East Susitna Drainage	3.4	1.6	0.0	14.5
West Side Cook Inlet/ West Susitna Drainage	13.1	23.5	4.8	21.0
Kenai Peninsula	62.3	52.1	92.1	5.0
Other Alaska	16.3	20.5	2.9	39.5

Side Cook Inlet/West Susitna Drainage. The boundaries of the various destination areas are shown in Figure 1-1. Very few or no trips were indicated for the other five destination areas.

The majority of trips by Anchorage-based guide businesses are to destinations in the Kenai Peninsula, but a large percentage of trips is also made to other Alaska and the West Side Cook Inlet/West Susitna Drainage. Kenai Peninsula-based guides provide an average of 92 percent of their trips to destinations in the Kenai Peninsula. Guides located in other areas of southcentral Alaska have a more diversified trip destination pattern and only do 5 percent of their business in the Kenai Peninsula.

The peak month of sport fishing activity in southcentral Alaska is July. Table 3-25 shows the average number of days per month that guide-related sport fishing services were provided. Guides in the Kenai Peninsula reported the greatest number of days per month, whereas businesses in other southcentral Alaska reported the least number of days.

Table 3-26 indicates the average number of trips per day made by various modes of transportation. The average for all guide businesses was 2.5 boat trips per day, 1.5 aircraft trips per day, and 2.5 trips per day via some other mode of transportation. Only 28 percent of the guide businesses answered the "aircraft trip per day" question, indicating that less than one third of the businesses operate aircraft. Only 21 percent of the guide businesses responded to the "other transportation" question, possibly indicating that most guides do not provide "other" modes of transportation, or because other modes were not specified no response was provided.

Table 3-25. Average Number of Days Per Month Services  
Provided to Sport Fishing Clientele

	Average All Guides	Mailing Address of Guide		
		Anchorage Area	Kenai Peninsula	Other Southcentral Alaska
May	5.6	4.1	7.1	4.1
June	16.4	15.4	19.1	11.4
July	19.3	17.2	22.1	14.5
August	14.3	15.2	15.5	10.8
September	10.0	9.0	11.6	7.1

Table 3-26. Average Number of Sport Fishing-Related Trips  
Per Day by Transportation Mode

		Mailing Address of Guide		
		Anchorage Area	Kenai Peninsula	Other Southcentral Alaska
	All Guides			
Boat <sup>1</sup>	2.5	1.7	3.4	1.9
Aircraft <sup>2</sup>	1.5	1.6	1.8	1.2
Other <sup>3</sup>	2.5	1.3	3.7	1.0

<sup>1</sup> Of the 99 guide services that returned their surveys, 90 provided a response for this survey question.

<sup>2</sup> Only 28 percent of guide businesses provided a response to this survey question.

<sup>3</sup> Only 21 percent of guide businesses provided a response to this survey question.



## Chapter 4

### ECONOMIC VALUE AND IMPACT OF SPORT FISHING IN SOUTHCENTRAL ALASKA

#### Introduction

The economic value of sport fishing in southcentral Alaska can be measured by anglers' total willingness to pay for sport fishing opportunities. This total willingness to pay has two components. The first component is the dollar amount that anglers currently pay for sport fishing-related goods and services, such as charter boat services, fishing gear and equipment, bait, boats, and trip-related services (e.g., transportation, food, lodging, etc.) These expenditures generate employment and income effects in the local, regional, and state economy and outside Alaska.

The second component of economic value is the dollar amount that anglers would be willing to pay (above what they already pay) to ensure the availability of sport fishing opportunities in southcentral Alaska. This nonmarket value is known as consumer's surplus or the net willingness to pay. Together, these two components provide a measure of the economic value or total willingness to pay for sport fishing.

This chapter presents estimates for 1986 of angler expenditures associated with sport fishing in southcentral Alaska; the related economic impacts in the Anchorage area, Kenai Peninsula, state of Alaska, and outside Alaska; and the net willingness to pay by Alaska resident and nonresident anglers for sport fishing at selected locations and throughout southcentral Alaska. The procedures used to derive these values and impacts are also summarized; a complete description of the methods can be found in Chapter 8 of this report.

#### Angler Expenditures

Angler expenditures were derived separately for resident and nonresident anglers. Sample data on average spending by sites and species, as well as sample data on the distribution of trips (and days fished) across species for each site, are combined with ADF&G data on total trips (and days fished) to each site to derive these estimates, which are shown in Table 4-1.

Table 4-1. Angler Expenditures and Net Willingness to Pay (WTP) Associated with Sport Fishing in Southcentral Alaska, by Activity and Fishery (Thousands of Dollars)

	Resident Anglers		Nonresident Anglers		Total	
	Expenditures	Net WTP	Expenditures	Net WTP	Expenditures	Net WTP
ALL SOUTHCENTRAL SPORT FISHING	\$74,163	\$246,391	\$52,892	\$30,385	\$127,055	\$276,776
King salmon - all sites	16,606	17,862	21,451	8,812	38,057	26,674
Halibut - all sites	12,615	21,626	6,031	3,526	18,646	25,152
Razor clams - all sites	1,025	1,757	945	268	1,970	2,025
<u>By Fishery:</u>						
Kenai River						
All sport fishing	18,932	15,241	19,029	8,011	37,961	23,252
King salmon fishing (early run)	4,186	4,038	6,148	2,916	10,334	6,954
King salmon fishing (late run)	3,184	2,477	5,142	2,444	8,326	4,921
Silver salmon fishing (early run)	2,848	2,541	1,068	466	3,916	3,007
Silver salmon fishing (late run)	2,020	1,645	2,619	1,139	4,639	2,784
Red salmon fishing	1,613	1,711	2,571	418	4,184	2,129
Rainbow trout fishing	1,989	688	486	125	2,475	813
Russian River						
Red salmon fishing (early run)	2,804	2,130	1,361	640	4,165	2,770
Red salmon fishing (late run)	480	211	566	267	1,046	478
Lower Streams in the Kenai Peninsula <sup>1</sup>						
All fishing	3,551	1,970	2,363	496	5,914	2,466
King salmon fishing	1,338	503	797	207	2,135	710
Deep Creek Marine						
King salmon fishing	1,427	1,253	929	404	2,356	1,657
Halibut fishing	1,840	2,357	2,192	269	4,032	2,626
Kachemak Bay - Halibut fishing	5,818	5,364	2,902	2,709	8,720	8,073
Resurrection Bay - Silver salmon fishing	1,118	902	775	450	1,893	1,352
Little Susitna River						
King salmon fishing	794	1,323	666	360	1,460	1,683
Silver salmon fishing	312	583	397	90	709	673
West Side Cook Inlet/West Side Susitna Streams <sup>2</sup>						
King salmon fishing	2,480	1,180	2,569	585	5,049	1,765
Silver salmon fishing	278	458	363	269	641	727
East Side Susitna Roadside Streams <sup>3</sup>						
King salmon fishing	435	576	507	134	942	710
Silver salmon fishing	161	726	195	45	356	771
Gulkana River						
All fishing	1,102	1,834	412	107	1,514	1,941
Grayling fishing	370	346	81	5	451	351
Lake Creek - all fishing	541	852	322	N/A	863	852
Kepler Lake Complex - Rainbow trout fishing	162	1,700	2	N/A	164	1,700
Lake Louise, Susitna, Tyone - Lake trout and burbot winter fishing	66	186	N/A	N/A	66	186
Anchorage Area Stocked Lakes - Rainbow trout and land-locked salmon fishing	1,395	2,335	316	90	1,711	2,425
Big Lake - Rainbow trout fishing	214	1,431	40	N/A	254	1,431

<sup>1</sup> Includes Ninilchik River, Anchor River, and Deep Creek.

<sup>2</sup> Includes Doshka River/Kroto Creek, Alexander Creek, Talachulitna River, Chuitna River, and Theodore, Lewis, and Ivan Rivers.

<sup>3</sup> Includes Montana Creek, Caswell Creek, Willow and Little Willow Creeks.

N/A = No data available.

### Resident Angler Spending

In 1986 resident anglers spent approximately 1,147,700 days sport fishing at sites in southcentral Alaska (Table 3-3). Total resident angler spending associated with these sport fishing activities is estimated at \$74.2 million, or approximately \$65 per angler day. Spending in Alaska associated with these activities was an estimated \$72.4 million. Resident angler spending was an estimated \$16.6 million associated with king salmon sport fishing, \$12.6 million associated with halibut sport fishing, and \$1.0 million associated with razor clam harvesting activities. Resident angler spending associated with specific fisheries in southcentral Alaska is shown in Table 4-1.

The estimates of resident angler spending were derived by calculating average spending per trip and per day by type of spending, and associated with each resident angler origin, each site visited, and each target species category available from site records in the resident angler sample data. These average spending values were multiplied by the sample distribution of trips from origin areas to sites for particular species to arrive at intermediate total resident angler spending estimates. The total spending values, reported in Chapter 8 by industrial sector for each origin area, then were used as control totals. These control totals were allocated proportionately to sites/species combinations by reference to the intermediate estimates and ADF&G data. Finally, these estimates by industrial sector were summed to achieve the resident angler totals shown in Table 4-1.

### Nonresident Angler Spending

In 1986, nonresident anglers spent about 201,500 days sport fishing at sites in southcentral Alaska. Total spending associated with these sport fishing activities are estimated at \$52.9 million, and spending in Alaska was an estimated \$20.8 million or approximately \$103 per angler day. Total nonresident angler spending was an estimated \$21.5 million associated with king salmon sport fishing, \$6.0 million associated with halibut sport fishing, and \$945,000 associated with razor clam harvesting activities in southcentral Alaska. Nonresident angler spending associated with specific fisheries is shown in Table 4-1.

The estimates of nonresident angler spending were derived by calculating average spending per day by type of spending, and associated with each nonresident site visited and each target species identified in the nonresident angler sample data. These average spending values were multiplied by the sample distribution of days fished at nonresident sites for particular species to arrive at intermediate total nonresident angler spending estimates. The total spending values for nonresidents, reported in Chapter 8 by industrial sector, then were used as



control totals. These control totals were allocated proportionately to sites/species combinations by reference to the intermediate estimates and ADF&G data. These estimates by industrial sector then were summed and converted to match the resident angler sites (by allocating spending to sub-sites in proportion to resident angler spending at those sites). Allocations to early and late runs of salmon on the Kenai and Russian Rivers were based on the proportion of reported trips to these sites for the particular species over the relevant period.

### Net Willingness to Pay

Net willingness to pay (WTP) is a measure of the dollar amount that anglers would be willing to pay over and above current expenditures to ensure the availability of sport fishing opportunities. These values, which were estimated separately for resident and nonresident anglers who sport fish in southcentral Alaska, are shown in Table 4-1.

For resident anglers, the total net WTP for all sport fishing opportunities in 1986 in southcentral Alaska is estimated at \$246.4 million, including more than \$17.8 million for king salmon, more than \$21.6 million for halibut, and more than \$1.7 million for razor clams. For nonresident anglers the total net WTP for sport fishing opportunities in southcentral Alaska is an estimated \$30.4 million. The availability of king salmon sport fishing opportunities in southcentral Alaska generated more than \$8.8 million in net WTP values to nonresidents, halibut more than \$3.5 million, and razor clams approximately \$270,000. The net WTP values of resident and nonresident anglers for specific fisheries in southcentral Alaska are shown in Table 4-1.

The estimates of net WTP were derived from travel cost models using discrete choice analysis of the sample data. These models use access costs from different origins to different sport fishing sites as proxies for price in analyzing the demand for sport fishing. The value of the sites, measured in terms of net WTP, is then derived from the demand equations.

### Economic Impacts

The economic impacts of sport fishing in southcentral Alaska are presented below for the Anchorage area, the Kenai Peninsula, the state of Alaska, and all areas outside Alaska.

#### Anchorage Area

Angler spending in the Anchorage area associated with sport fishing in southcentral Alaska is shown by industry in Table 4-2. This spending includes expenditures by both resident (\$36.8 million) and nonresident (\$7.6 million) anglers and is

Table 4-2. Angler Spending in the Anchorage Area Associated  
with Sport Fishing in Southcentral Alaska (1986 \$)

Industry	Resident Anglers	Nonresident Anglers	Total Angler Spending
Fish Packing/Processing	\$ 327,000	\$ NA	\$ 327,000
Boat Building/Repair	6,707,000	NA	6,707,000
Passenger Transportation	2,403,000	1,445,000	3,848,000
Retail Trade	25,266,000	3,829,000	29,095,000
Hotel/Lodging Places	326,000	1,247,000	1,573,000
Eating/Drinking Establishments	1,595,000	911,000	2,506,000
Guide Services	<u>218,000</u>	<u>125,000</u>	<u>343,000</u>
TOTAL	\$36,842,000	\$7,557,000	\$44,399,000

NA = No data available but considered minor.

estimated at \$44.4 million in 1986. More than 65 percent of all angler expenditures were made in the retail trade sector.

Total angler spending translates into direct employment of 781 people (equivalent to 376 full-time jobs) in the Anchorage area, as shown in Table 4-3. As would be expected, based on the relative amount of spending on retail goods, the majority of this employment is in the retail trade sector. A large amount of passenger transportation jobs is also supported by angler spending. This industry has more than double the employment of the boat building/repair industry, yet angler spending for passenger transportation is only 56 percent of the spending for boat building and repair. This indicates that the output per worker is greater in the boat building/repair industry than in the passenger transportation industry. (In fact, output per worker in the boat building/repair industry is almost four times greater than output per worker in the passenger transportation industry; see Chapter 8, Table 8-32).

Direct earnings attributed to the 781 direct jobs are equal to \$7.5 million. Approximately 53 percent of this income, or \$4 million, is earned by workers in the Anchorage retail trade sector.

Total production of goods and services (output), employment, and earnings in the Anchorage area from angler spending is shown in Table 4-4. More than \$117.2 million in output is generated by angler expenditures. This output supports the equivalent of more than 1,400 full-time jobs in various industrial sectors. The majority of the output which is generated and jobs that are supported are in the trade sector (which includes both wholesale and retail trade).

#### Kenai Peninsula

Angler spending in the Kenai Peninsula associated with sport fishing in southcentral Alaska is shown by industry in Table 4-5. This spending includes expenditures by both resident (\$22.7 million) and nonresident (\$9.1 million) anglers and is estimated at \$31.8 million in 1986. In the Kenai Peninsula, more than 45 percent of all angler expenditures are made in the retail trade sector.

Total angler spending translates into direct employment of 886 people (equivalent to 375 full-time jobs) in the Kenai Peninsula, as shown in Table 4-6. The majority of this employment is in the guide services sector. Although there is a large amount of guide service employment, many of these jobs are seasonal and short in duration. (The average job length for guides in the Kenai Peninsula is less than 3 months; see Chapter 3, Table 3-20.) A large number of retail trade, hotel and lodging, and eating and drinking sector jobs is also generated by angler spending.

Table 4-3. Direct Jobs and Income in the Anchorage Area  
Supported by Angler Spending Associated with  
Sport Fishing in Southcentral Alaska

Industry	Direct Employment (No. of Jobs)	Full-Time Equivalent Employment	Direct Earnings (1986 \$)
Fish Packing/Processing	20	9	\$ 172,000
Boat Building/Repair	66	28	706,000
Passenger Transportation	144	47	1,454,000
Retail Trade	385	202	3,991,000
Hotel/Lodging Places	81	30	545,000
Eating/Drinking Establishments	62	54	537,000
Guide Services	<u>23</u>	<u>6</u>	<u>91,000</u>
TOTAL	781	376	\$7,496,000

Table 4-4. Total Output, Employment and Income in the Anchorage Area Generated by Angler Spending Associated with Sport Fishing in Southcentral Alaska

Industrial Sector	Total Output (1986 \$)	Total Employment (full-time equivalents)	Total Earnings (1986 \$)
Agricultural Services, Forestry, & Other	\$ 773,000	12	\$ 61,000
Mining	1,612,000	5	295,000
Construction	1,269,000	13	587,000
Manufacturing	11,185,000	96	2,586,000
Trans., Comm., & Utilities	7,891,000	65	2,418,000
Trade	35,707,000	884	18,172,000
Finance, Insurance & Real Estate	10,581,000	70	1,877,000
Services	14,341,000	308	7,172,000
Government	425,000	10	309,000
Households	<u>33,478,000</u>	<u>NA</u>	<u>NA</u>
TOTAL	\$117,262,000	1,463	\$33,477,000

NA = Not applicable.

Table 4-5. Angler Spending on the Kenai Peninsula Associated  
with Sport Fishing in Southcentral Alaska (1986\$)

Industry	Resident Anglers	Nonresident Anglers	Total Angler Spending
Fish Packing/Processing	256,000	\$ NA	\$ 256,000
Boat Building/Repair	3,373,000	NA	3,373,000
Passenger Transportation	463,000	700,000	1,163,000
Retail Trade	11,693,000	2,830,000	14,523,000
Hotel/Lodging Places	1,407,000	1,616,000	3,023,000
Eating/Drinking Establishments	3,651,000	1,034,000	4,685,000
Guide Services	<u>1,813,000</u>	<u>2,971,000</u>	<u>4,784,000</u>
TOTAL	\$22,656,000	\$9,151,000	\$31,807,000

NA = No data available but considered minor.

Table 4-6. Direct Jobs and Income in the Kenai Peninsula  
Supported by Angler Spending Associated with  
Sport Fishing in Southcentral Alaska

Industry	Direct Employment (No. of Jobs)	Full-Time Equivalent Employment	Direct Earnings (1986 \$)
Fish Packing/Processing	16	7	\$ 132,000
Boat Building/Repair	33	14	353,000
Passenger Transportation	43	14	431,000
Retail Trade	190	100	1,975,000
Hotel/Lodging Places	156	58	1,058,000
Eating/Drinking Establishments	117	102	1,009,000
Guide Services	<u>331</u>	<u>80</u>	<u>1,286,000</u>
TOTAL	886	375	\$6,244,000

The Kenai Peninsula industries combine to have more employment than angler expenditure-related employment in the Anchorage area, although angler spending in the Kenai Peninsula comprises only 71 percent of the spending in the Anchorage area. This indicates that the average output per worker for sport fishing-related industries is greater in the Kenai Peninsula area than in the Anchorage area.

Direct earnings attributed to the 886 direct jobs are equal to \$6.2 million. Approximately 32 percent of this income, or \$2 million, is earned by workers in the Kenai Peninsula retail trade sector. Guide service workers received almost \$1.3 million in 1986 in the Kenai Peninsula.

Total output, employment, and earnings in the Kenai Peninsula from angler spending are shown in Table 4-7. More than \$75.7 million in output is generated by angler expenditures. This output supports the equivalent of 967 full-time jobs in various industrial sectors. The majority of the output that is generated and jobs that are supported is in the trade and services sectors.

#### Total Alaska

Angler spending in Alaska associated with sport fishing in southcentral Alaska is shown by industry in Table 4-8. Total angler spending, including both resident (\$72.4 million) and nonresident (\$20.8 million) angler expenditures, amounted to more than \$93.2 million in 1986. Almost 55 percent of all angler expenditures are made in the retail trade sector. Approximately 82 percent of these expenditures are made in either the Anchorage area or the Kenai Peninsula; the remainder (more than \$17 million) is spent in other areas of Alaska, including the Fairbanks area.

Total angler spending translates into direct employment of 2,178 persons (equivalent to 990 full-time jobs), as shown in Table 4-9. The relatively large amount of spending on retail goods leads to a large amount of employment in the retail trade sector. The second largest number of jobs is generated in the guide services industry.

The direct earnings attributed to the 2,178 direct jobs are equal to \$18.3 million. Approximately 42 percent of this income, or \$7.6 million, is earned by workers in the Alaska retail trade sector.

Total output, employment, and earnings in Alaska from angler spending are shown in Table 4-10. More than \$206 million in output is generated by angler expenditures. This output supports the equivalent of over 2,800 full-time jobs, the majority of which are in the trade and services sectors. About 83 percent of the employment supported by angler spending is in



Table 4-7. Total Output, Employment and Income on the Kenai Peninsula Generated by Angler Spending Associated with Sport Fishing in Southcentral Alaska

Industrial Sector	Total Output (1986 \$)	Total Employment (full-time equivalents)	Total Earnings (1986 \$)
Agricultural Services, Forestry, & Other	\$ 494,000	8	\$ 39,000
Mining	1,471,000	5	270,000
Construction	1,034,000	10	478,000
Manufacturing	6,264,000	54	1,448,000
Trans., Comm., & Utilities	3,849,000	32	1,179,000
Trade	17,751,000	439	9,034,000
Finance, Insurance & Real Estate	4,370,000	29	775,000
Services	17,802,000	383	8,902,000
Government	321,000	7	234,000
Households	<u>22,360,000</u>	<u>NA</u>	<u>NA</u>
TOTAL	75,716,000	967	22,359,000

NA = Not applicable.

Table 4-8. Angler Spending in Alaska Associated with  
Sport Fishing in Southcentral Alaska (1986 \$)

Industry	Resident Anglers	Nonresident Anglers	Total Angler Spending
Fish Packing/Processing	\$ 593,000	\$ NA	\$ 593,000
Boat Building/Repair	12,744,000	NA	12,744,000
Passenger Transportation	3,813,000	3,454,000	7,267,000
Retail Trade	43,337,000	8,210,000	51,547,000
Hotel/Lodging Places	2,882,000	3,580,000	6,462,000
Eating/Drinking Establishments	6,689,000	2,348,000	9,037,000
Guide Services	<u>2,379,000</u>	<u>3,211,000</u>	<u>5,590,000</u>
TOTAL	\$72,437,000	\$20,803,000	\$93,240,000

NA = No data available but considered minor.

Table 4-9. Direct Jobs and Income in Alaska Supported by Angler Spending Associated with Sport Fishing in Southcentral Alaska

Industry	Direct Employment (No. of Jobs)	Full-Time Equivalent Employment	Direct Earnings (1986 \$)
Fish Packing/Processing	37	17	\$ 311,000
Boat Building/Repair	153	64	1,636,000
Passenger Transportation	282	93	2,843,000
Retail Trade	732	385	7,597,000
Hotel/Lodging Places	344	127	2,323,000
Eating/Drinking Establishments	239	209	2,071,000
Guide Services	<u>391</u>	<u>95</u>	<u>1,518,000</u>
TOTAL	2,178	990	\$18,299,000

Table 4-10. Total Output, Employment and Income in Alaska Generated by Angler Spending Associated with Sport Fishing in Southcentral Alaska

Industrial Sector	Total Output (1986 \$)	Total Employment (full-time) equivalents)	Total Earnings (1986 \$)
Agricultural Services, Forestry, and Other	\$ 1,366,000	21	\$ 108,000
Mining	3,103,000	10	569,000
Construction	2,539,000	25	1,175,000
Manufacturing	20,754,000	179	4,798,000
Trans., Comm., and Utilities	14,659,000	121	4,492,000
Trade	62,457,000	1,546	31,786,000
Finance, Insurance, and Real Estate	16,289,000	108	2,890,000
Services	37,734,000	811	18,870,000
Government	808,000	19	588,000
Households	<u>46,469,000</u>	<u>NA</u>	<u>NA</u>
TOTAL	\$206,178,000	2,840	\$65,276,000

NA = Not applicable.

these two industries. Earnings associated with the 2,840 sport fishing-related jobs in Alaska amount to more than \$65.2 million.

#### Outside Alaska

Angler spending outside of Alaska associated with sport fishing in southcentral Alaska is shown by industry in Table 4-11. This spending includes expenditures by both resident (\$1.7 million) and nonresident (\$32.1 million) anglers and was an estimated \$33.8 million in 1986. More than 91 percent of all angler expenditures made outside the state is in the transportation sector.

Total output, employment, and earnings outside Alaska from angler spending associated with sport fishing in southcentral Alaska are shown in Table 4-12. Although a relatively large amount of total angler expenditures (\$93.2 million out of \$127.1 million) is made inside Alaska, the majority of these initial expenditures is respent by Alaska businesses outside the state. Consequently, angler expenditures result in a large impact on employment and income generation outside the state. Approximately \$420 million in output is generated outside of Alaska by angler expenditures. This output supports the equivalent of 3,953 full-time jobs in various industrial sectors. The majority of the output that is generated and jobs that are supported is in the manufacturing sector. This sector provides goods to Alaska businesses for resale to anglers.

Table 4-11. Angler Spending Outside Alaska Associated  
with Sport Fishing in Southcentral Alaska (1986 \$)

Industry	Resident Anglers	Nonresident Anglers	Total Angler Spending
Fish Packing/Processing	\$ 0	\$ 0	\$ 0
Boat Building/Repair	731,000	0	731,000
Passenger Transportation	0	31,084,000	31,084,000
Retail Trade	946,000	862,000	1,808,000
Hotel/Lodging Places	0	126,000	126,000
Eating/Drinking Establishments	49,000	17,000	66,000
Guide Services	<u>0</u>	<u>0</u>	<u>0</u>
TOTAL	\$1,726,000	\$32,089,000	\$33,815,000

Table 4-12. Total Output, Employment and Income Outside Alaska Generated by Angler Spending Associated with Sport Fishing in Southcentral Alaska

Industrial Sector	Total Output (1986 \$)	Total Employment (full-time equivalents)	Total Earnings (1986 \$)
Agricultural Services, Forestry, and Other	\$ 10,924,000	170	\$ 1,764,000
Mining	12,992,000	40	1,142,000
Construction	5,305,000	53	1,124,000
Manufacturing	127,682,000	1,101	30,179,000
Trans., Comm., & Utilities	64,342,000	528	15,971,000
Trade	30,329,000	751	11,026,000
Finance, Insurance & Real Estate	36,607,000	243	4,256,000
Services	44,226,000	950	15,448,000
Government	5,036,000	117	2,297,000
Households	83,207,000	NA	NA
TOTAL	\$420,650,000	3,953	\$83,207,000

NA = Not applicable.

## DETAILED METHODOLOGY AND CASE STUDY

This section provides details for the more technical reader concerning the data collection, processing, and analytical procedures used in the study, and describes the case study results. A description of the relevant economic concepts and measurement techniques is presented first.





## Chapter 5

### ECONOMIC CONCEPTS AND VALUATION METHODS

#### Concepts of Economic Value

The primary unit of account to assess the economic value of a fishery such as the southcentral Alaska sport fishery is personal income, particularly the income of Alaska households. The value of the fishery can be translated into monetary units that reflect potential effects on household incomes in two ways. First, with regard to market effects such as expenditures by anglers on equipment, fishing gear, guide services, travel, and other sport fishing-related items, the direct and indirect impacts of the fishery can be assessed in terms of its contribution, both directly and indirectly, to personal incomes (i.e., employment income plus profits accruing to owners of businesses) within the state of Alaska.

The second measure of income pertains to nonmarket effects of the fishery, such as the enjoyment which the fishery provides for the many Alaska residents and nonresidents who go fishing in southcentral Alaska, and the pleasure that both residents and nonresidents derive from the continued existence of the sport fishery, even though they do not participate in sport fishing. Although not transmitted through the marketplace, these values are real, and can be quantified empirically. This quantification is also conducted in terms of personal income -- not the amount of personal income actually generated by the fishery, but the personal income equivalent to the satisfaction derived from the fishery. That is, nonmarket values are measured in monetary units equal to an equivalent adjustment in income.

Technically, nonmarket values can be measured in two ways. Individuals who gain satisfaction from the fishery can be asked how much they would be willing to pay over and above what they already pay (if anything) to preserve and maintain the fishery. Alternatively, individuals can be asked how much compensation they would have to be given to offset the loss of satisfaction if the fishery no longer existed. These measures are known, respectively, as the "willingness to pay" (WTP) and "willingness to accept" (WTA) measures for nonmarket values associated with the sport fisheries.

The computation of WTP or WTA requires complex procedures. Before addressing these computational requirements, however,

several additional points concerning these concepts need to be made.

First, the WTP and WTA measures are not necessarily equal. Specifically, WTA could be larger than WTP. Second, where they do differ, a value judgement is required to decide which measure should be used. If one believes, however, that people have a "right" to enjoy the existence of the sport fishery, then WTA is the appropriate measure of value. Third, although they differ in concept, both measures have in common the notion that a nonmarket value is represented by an income adjustment that is equivalent to its impact on personal welfare. Therefore, either measure can legitimately be added to market effects on personal income to obtain an estimate of the economic value of the fishery.

The decision to employ WTP or WTA as a standard of value is itself a value judgement. It arises from a utilitarian and homocentric ethic which implies that the fishery counts only to the extent that people care about it. People may care for different reasons and to different degrees, but what matters is that they do care about the fishery. This value can be cast into monetary units using either a WTP-type or a WTA-type measure.

The distinction previously made among types of nonmarket value needs to be emphasized. One type of nonmarket value pertains to the satisfaction that anglers obtain from the fishery. Although anglers incur some expenses from participating in fishing, the fishery has some positive value to them over and above their expenses, measured in terms of either WTP or WTA. This is characterized as a "use" value of the fishery. In addition, however, there may be "nonuse" values such as "existence," "option," or "bequest" values. People may gain satisfaction from the fishery not because they make use of it, but for other reasons as well. In addition, persons who never fish may still place a value on the continued existence of the fishery. Although such nonuse values may be significant, only use values are considered in this study.

In addition to personal income, two other measures of value important to this study are employment and sales. These measures are of regional importance not only to the economic sectors that provide services to anglers in southcentral Alaska, but also to other sectors of the Alaska economy that are indirectly linked to the study area. The regions for consideration in this study include the Anchorage area, Kenai Peninsula, other Alaska, and outside Alaska.

## Measurement of Sport Fishing Economic Values

### Nonmarket Recreation Values

Alternative Methods. Two main empirical approaches are available to quantify WTP and WTA measures of value for sport fishing. One approach is the "Contingent Valuation" (CV) method in which people are interviewed and 1) asked directly how much they would be willing to pay to preserve the fishery, or 2) how much compensation they would require to forego their participation. (For a thorough review of contingent valuation methods used to value public goods such as fisheries, see Mitchell and Carson; Cummings, et al. 1986.) A second approach is the "Revealed Preference" (RP) method in which the individual's actual choices concerning his/her use of the fishery are observed. By observing such choices, it is possible to infer something about these peoples' values and preferences and, in turn, to deduce what monetary value they would place on the fishery. The point is, that by participating in fishing to various degrees, people already make tradeoffs between fishing and money. Fishing imposes costs (some of them explicit, others implicit) and the resources spent on fishing could have been spent on other activities, if the individual so desired.

The essence of the RP approach is to observe different people's choices, infer their trade-offs, and, with that information, deduce the WTP or WTA measures. Technically, three steps are involved: 1) collecting data on recreational behavior by sampling anglers, 2) statistically estimating demand functions to data, and 3) applying theoretical models that generate formulas for WTP or WTA measures as a function of the estimated coefficients and variables in the demand equations. Because of its reliance on data about travel behavior for recreation, the RP approach is also known as the "Travel Cost" method. (For a detailed examination of the travel cost method, see Bockstael, et al. 1984; McConnell 1985; Smith and Desvougues 1986.)

Refinements to CV methodology in recent years have lessened the distinction between the CV and the RP approach. CV practitioners have imposed a certain theoretical structure on the responses to WTP or WTA questions which can be exploited in the statistical analysis of these responses. This procedure broadens the types of questions that can be employed in CV surveys. The motivation for these developments is greater accuracy and reliability in CV surveys.

In effect, the CV approach creates a simulated market which reveals information about individuals' preferences and about their tradeoffs between the fishery and money. This information is analogous to the information yielded from actual choices in the travel cost approach.

Study Approach and Data Requirements. Both the RP/travel cost method and the CV method are used for this study. The primary objective in employing the travel cost method is to assess the value of alternative types of fishery conditions and species. The crucial requirement is to obtain data on actual fishing behavior under a variety of fishery conditions over the study period (the 1986 fishing season). Previous studies of sport fishing have focused on recreational activities by individuals or groups of individuals over the season as a whole. Because fishing conditions in southcentral Alaska are highly variable over the season, with substantial changes in fishing opportunities on almost a weekly basis depending on sport fishing regulation and the timing of fisheries, a seasonal approach is not well suited for this study.

The selected approach requires tracking anglers' choices week by week to correlate them with changes in fishing opportunities. This approach necessitates obtaining data from resident anglers on a trip-by-trip basis, as opposed to summaries of total trips over the season. The data are essentially equivalent to an "angler's diary," in which each trip is recorded separately, yielding precise information on the timing of sport fishing activity. Angler's choices among sites and species are then evaluated using discrete choice models. (For a thorough description and applications of discrete choice models, see Maddala 1983; McFadden 1984; Ben-Akiva 1985; and Train, et al. 1987.)

The CV analysis focuses on a specific activity -- catching king salmon on the Kenai River. Relatively precise and reliable responses can be obtained within the format of a mail questionnaire. To enhance realism, a closed-ended question focusing on a modification of an existing license program is used. The potential of making extra payment which permits a higher quality of fishing opportunities is examined. By observing and analyzing individuals' responses to this hypothetical choice, it is possible to estimate the monetary value that they place on the Kenai River salmon fishery. This value can then be compared with the value derived from the travel cost model.

### Economic Impacts

Alternative Methods. Methods for evaluating the regional economic impacts of sport fishing activities generally can be classified into three categories: 1) econometric models, 2) economic base models, and 3) input-output models. Each of these approaches is briefly described and applications within the study area are noted.

Econometric Models. Typically constructed from time-series data for the region(s) of interest, these stochastic models are estimated using regression techniques. Systems of

equations (frequently simultaneous in nature) are prepared that relate economic and demographic variables. Both exogenous variables (determined outside the system) and endogenous variables (estimated within the system) are included in these equations. Theoretical considerations form the basis for connections between the two sets of variables, with the values of parameters developed statistically from economic data available for the region. Applications of these models require sufficient input data to accurately estimate critical parameters, appropriately structured exogenous information, and firm theoretical bases linking exogenous and endogenous components.

The University of Alaska's Institute for Social and Economic Research (ISER) has performed the most extensive work on modeling the Alaska economy using econometric models. ISER developed a model of the state economy and its principal subregions for the Man-in-the-Arctic Program (for additional information, see ISER 1983). The Man-in-the-Arctic Program (MAP) model was designed to simulate future economic performance based on regression analysis of historic relationships among employment, income, population, and fiscal variables.

The MAP model uses a "top-down" approach. State-level forecasts are prepared and shared down to aggregations of census areas and labor market areas. The model is especially well-suited to forecasting and impact analysis at a state level, and tracing these state-wide impacts to substate areas. It is less suited to examining local effects, or assessing the broader-area "ripple" or "multiplier" effects of localized actions.

Economic Base Models. These models rely on the conceptual distinction between a region's "basic" economic activities (those which are exported to other regions and thus bring income to the region), and "nonbasic" activities (those which exist to support the region's population and basic activities). When each activity is measured, usually in terms of employment or income, these two categories of economic activity can be expressed in the form of a ratio. The ratio of nonbasic to basic employment (or income) can be thought of as a "multiplier" that can be used to forecast changes in nonbasic employment (or income) from a proposed change in basic employment (or income). The chief difficulty with this modeling approach lies in the task of distinguishing a region's basic activities from its nonbasic activities.

A study on the economic impacts of commercial fishing activity in the Cook Inlet (R. G. Wilson and Associates, 1978) used an impact multiplier based on an economic base model. Multipliers in the study were not differentiated by sector.

Input-Output Models. Regional interindustry linkages are the focus of input-output models, which are built from detailed accounts of the money flows between different sectors of the economy. An increase in production in one economic sector leads to smaller production increases in other sectors,

which in turn lead to further increases, and so on. Input-output models simultaneously consider these intersectoral linkages. Construction of full-scale regional input-output models can be costly and time-consuming, and thereby impractical for use in impact analysis. Techniques used for regionalizing national input-output relationships, however, employ secondary data, making this a viable approach.

Three input-output (I-O) models using secondary data have been applied in Alaska. First, the U. S. Forest Service (C. J. Palmer 1983) applied IMPLAN, the Forest Service I-O modeling system, to Alaska subregions on an experimental basis. Second, a modified version of IMPLAN was used to analyze the contribution of the pulp and paper and tourism industries to Alaska's economy. Third, C. L. Logsdon et al. (1977) estimated a statewide input-output table for Alaska using Washington I-O data, adapted to Alaska using location quotients developed for Alaska industries.

#### Study Approach and Data Requirements

Study Approach. Input-output analysis is the preferred method for this study. It accounts for the full range of economic impacts attributable to sport fishing in southcentral Alaska. Insufficient time series data on angler spending preclude the valid use of an econometric approach. An economic base approach is considered inappropriate for this study because the businesses that serve anglers do not constitute "basic" industries.

Angler spending, by business type and by location, constitutes the final demands input to the modeling system. These "first round" sales lead to further spending by businesses for goods and services supporting their activities, and by employees of the businesses respending their wages. Input-output models are regionalized to reflect the interindustry structures of the Anchorage area, the Kenai Peninsula, and Alaska as a whole. The effects of second and later round spending changes on the regional economies of these areas are captured by these regional models. Another model, of the U. S. economy, provides estimates of effects to areas outside Alaska. Total economic impacts are expressed in terms of sales, employment, and income impacts to each geographic area.

Data Requirements. The economic impact analysis considers the separate effects of sport fishing to the Anchorage area, the Kenai Peninsula, the rest of Alaska, and areas outside Alaska. Consequently, it is necessary to quantify angler expenditures in each of those areas that result from sport fishing throughout southcentral Alaska. A survey of both resident and nonresident anglers provides the data required to quantify angler expenditures. Business sector and guide surveys, supplemented by key secondary data sources, provide the necessary

information for deriving total economic impacts from these angler expenditures.

Angler Spending. Data essential to the impact analysis are estimates of angler spending by type of business and by area of spending. Surveys of resident and nonresident anglers provide these data. Extrapolation of the survey estimates to the angling population then requires information on the total number of resident and nonresident anglers who sport fished in southcentral Alaska.

Direct Impacts. Estimating the direct impact of angler spending requires employment, sales, and income data from the businesses that serve the anglers. These data are needed from sport fishing-related businesses in the Fairbanks to Kenai Peninsula region where most anglers who fish in the study area live.

Data from Anchorage and Kenai Peninsula businesses are required for the impact analyses focusing on those two regions, respectively, and data from Fairbanks and Matanuska/Susitna area businesses are needed to indicate effects elsewhere in Alaska. These data are needed to translate angler spending estimates to employment and income effects in those businesses serving anglers. Sales-per-worker and income-per-worker ratios are derived from the business surveys and applied to the angler spending estimates to calculate direct impacts.

Total Impacts. Most of the information required for estimating total economic impacts -- above and beyond the direct impacts -- is necessarily obtained from secondary data sources. Of particular importance are the U. S. Census Bureau's County Business Patterns and the U. S. Bureau of Economic Analysis's Regional Economic Information System. These two data sources represent critical inputs to the regional interindustry modeling system used to construct input-output models for each of the study areas. Expenditure data obtained from sport fishing-related businesses and guides are useful for benchmarking the input-output models, but are insufficient to completely construct the models.





## Chapter 6

### DATA COLLECTION METHODS

The objective of the data collection effort was to obtain sufficient data to perform the economic analyses and to profile the sport fishing industry. The data collection effort required the design, testing, and implementation of surveys to collect primary data from resident and nonresident anglers, and from sport fishing-related businesses and guides. Copies of the survey forms are included in Appendix A.

#### Survey Design and Testing

The primary method used to collect the survey data was mail questionnaires. This survey method was selected because mail surveys were considered: 1) the most cost-effective approach to collect extensive survey data from a large sample population; 2) an effective way to reach angling households with no phones; 3) an effective way to include households in which members would not be interviewed; and 4) a means to avoid the potential problems of interviewer bias.

Because of the extensive data requirements, the design of survey instruments was critical to conducting an effective data collection effort. An important concern was to achieve acceptable response rates, thereby minimizing potential nonresponse bias. To accomplish this objective, meetings or focus group sessions were conducted with anglers and sport fishing industry representatives to obtain their comments on the study. The survey design was then tested in a pilot study.

#### Focus Groups and Pretesting

A series of focus group sessions were conducted with anglers and representatives of different sport fishing associations, including guides and sport fishing-related businesses. The principal objectives of these sessions were to elicit information from knowledgeable persons to formulate the survey design, and to design specific survey questions. The initial sessions were more conceptual, focusing on issues affecting participation in the survey; subsequent meetings focused on the wording and clarity of specific questions.

Three focus group sessions were held with resident anglers. The first session explored how anglers decide when and where to go fishing, the types of fishing trips that comprise an angler's portfolio of trips, the feasibility of predicting accurately the

number of trips to be taken over future months, the type of expenditures incurred related to fishing, and the feasibility of a diary approach to collect information on sport fishing activities. The second angler session focused on obtaining feedback on a draft survey instrument that was prepared after the first session. Important site characteristics, site visitation, expenditures, the need for incentives, and issues for a contingent valuation survey were discussed. A redesigned version of the resident angler survey was pretested at the third focus group session.

The orientation of the two guide and business focus group sessions differed from that with the anglers. At the initial sessions, potential response problems were explored and suggestions, such as using only one mail-back at the end of season, were made. Similar to the angler sessions, the follow-up sessions were devoted to an investigation of specific issues and questions. Because several important design issues were unresolved, only limited pretesting of the guide and business questionnaires occurred at the follow-up sessions. Some individual questions, however, were evaluated by the focus group participants for potential response problems.

### Pilot Study

A pilot study was conducted to identify problem areas in the survey design prior to full-scale survey implementation. The focus of the pilot study was on the resident and nonresident angler survey design, although the business sector survey design also was tested. Objectives of the pilot study included:

- 1) test response rates and the need for incentives;
- 2) evaluate the effectiveness of follow-up mailings;
- 3) test the effectiveness of the survey instruments; and
- 4) review and analyze the survey data collected.

These objectives were addressed by conducting a miniaturized walk-through of the survey design for the resident angler, nonresident angler, and business sector surveys. This process also facilitated the testing of survey implementation procedures, such as mailing services and the use of computer services to draw the appropriate samples.

To accomplish the pilot study objectives, it was necessary to develop a survey design that approximated as closely as possible the full-scale summer survey. Because pretesting at the focus group sessions had uncovered certain problems in the survey instruments, additional pretesting was conducted prior to implementation of the pilot study to resolve problems of question clarity and logic. This process allowed for a more "true" test of the survey designs.

Although efforts were made to simulate the conditions of the full-scale survey, certain less-than-ideal conditions for the pilot study were unavoidable. The study was conducted between March and May, typically a time in which little fishing occurs. This timing is suspected to have negatively influenced the response rate of resident anglers. Timing also likely influenced the response of nonresident anglers because the sample consisted of 1985 licensees exclusively. The lapse of time since the trip was taken is believed to have negatively affected the response rate. Other less-than-ideal conditions were that the survey instruments were not in the final design format and that, with the exception of the business surveys, no incentives were provided.

Despite these testing conditions, the results of the pilot study were encouraging. The specific procedures followed to conduct each survey, and the results, including response rates and an evaluation of the effectiveness of each survey instrument, were described in a Pilot Study report (Jones & Stokes Associates et al. 1986).

### Survey Implementation

#### Resident Angler Survey

The goal of the resident angler survey was to obtain data on summer sport fishing activities from 1,500 Alaska households. The survey effort involved the administration of four data collection efforts: an early season survey, a mid-season survey (QI), an end-of-season survey (QII), and a combined season survey (Combo). These survey efforts are described below.

Early Season Survey. The early season survey had three primary objectives: 1) to identify, from a random survey, households with members who intended to sport fish in the study area between May and September. Fishing households identified by this process would comprise the list for subsequent follow-up surveys; 2) to collect information from respondents who did not plan to fish to analyze factors that explain fishing participation; and 3) to collect information on characteristics of fishing households to potentially determine how the sample of fishing households used in the analysis deviated from the general fishing population.

The survey area included all of the southcentral Alaska study area, Fairbanks and vicinity, and other parts of Alaska excluding the southeast. (The southeast was excluded because ADF&G data indicated that relatively few sport fishing trips are made to southcentral Alaska from the southeast.) The sampling frame for surveying residents of the Anchorage area, which comprised approximately 60 percent of the sample, was an occupant file. The primary advantage of using the occupant file

was that it produced a more representative sample of the fishing population. The occupant file was then merged with the voter registration file, which provided names to address the surveys. The voter registration file was exclusively used to draw the sample from outside the Anchorage area because an occupant file was not available. Duplicate registered voters in a household were eliminated from the list.

A sample of 7,500 households was selected to meet response goals, and the survey cards were mailed in early June. The sampling proportions were based on the relative populations in the survey subareas.

Questionnaire I (QI). The primary objective of QI was to survey anglers midway through the season about their sport fishing activities. This mid-season approach had certain advantages over a one-time survey administered either at the beginning or at the end of the season. Comments provided at the focus group sessions indicated that respondents could lose their diary/survey instrument if required to maintain records throughout the season. The primary problem with an end-of-season survey was potential recall difficulties, especially for frequent anglers.

QI (Appendix A) was mailed in early August to 3,200 respondents to the preseason survey who indicated that household members expected to (or may) sport fish in Alaska between May and September. The administration of QI in early August was intended to correspond with the ending of the king salmon season. The following types of information were requested in QI: household composition, fishing behavior and attitudes, frequency of household visitation to certain Alaska sport fishing sites, winter sport fishing activities, specific information on all sport fishing trips during May, June, and July, expenditure information for all sites visited during May, June, and July, suggestions for improving sport fishing in Alaska, and demographic information.

To increase participation, prizes were offered in a drawing. These prizes included charter fishing trips for king and silver salmon on the Kenai River, a rod and reel combination, and a fly-in fishing trip to King Lake. A follow-up reminder card mailed 2 weeks after the initial mailing also was used to increase the response.

Questionnaire II (QII). This end-of-season questionnaire was designed to collect trip- and site-specific information for the months of August and September. The questionnaire was mailed in mid October to respondents to QI. A follow-up reminder card and a replacement questionnaire were mailed approximately 5 and 11 weeks later, respectively, to nonrespondents.

In addition to trip- and site-specific questions, QII requested information on total 1986 sport fishing-related expen-

ditures. A split sample approach was used to collect this information. One-half of the sample received a survey that requested information by type of expenditure (i.e., goods and services); the other 50 percent received a survey requesting information on purchases by type of business. The geographical location of purchase also was requested.

The split sample approach was used to facilitate the collection of expenditure data by type of business required for the impact analysis while minimizing potential nonresponse problems. Comments at the focus group sessions indicated that response problems could be expected with the collection of expenditure information by type of business. A contingent valuation question concerning payment for the opportunity to catch additional king salmon on the Kenai River also was included in QII.

As with QI, prizes were offered in a drawing to encourage participation. The prizes included a full-day halibut charter, a Devil's Canyon tour, a pair of hip waders, and cans of smoked salmon.

Combination Questionnaire (Combo). Nonrespondents to QI received a combined version of QI and QII. This approach was implemented because of insufficient time between the mailing of QI (early August) and QII (mid-October) to use a second follow-up to QI, and still use QII effectively. The key elements of QI and QII were included in the Combo, which was mailed in late October. Early respondents were eligible for the prize drawing described for QII above. A replacement questionnaire was mailed 5 weeks later to all nonrespondents.

#### Nonresident Angler Survey

A single questionnaire was used to survey nonresident anglers. The questionnaire (Appendix A) requested information on the number of recent trips to Alaska by purpose of trip, on their familiarity with Alaska fishing sites, sociodemographic characteristics, and details on the most recent trip to Alaska, including sites visited, days fished, fish caught, type of transportation used, and expenditures. As with the survey of resident anglers, a split sample approach was used to collect expenditure data by purchase item or by type of business. A contingent behavior question concerning the effect of higher transportation costs on the decision to visit Alaska also was asked.

The response goal for the nonresident angler survey was 750 questionnaires. The survey was implemented in two phases. Phase 1 involved surveying persons who had fished in Alaska between 1983 and 1985. The ADF&G nonresident angler license file was used to draw a sample of 1,104 names. The number of names drawn from a given year was based on that year's propor-

tionate share of all nonresident licenses purchased over the 3-year period.

Of the 1,104 questionnaires mailed in early September, 860 were mailed to U. S. residents and 244 were mailed to residents of foreign countries. Nonresident anglers from foreign countries were oversampled because of the anticipated lower response rate. A follow-up reminder card and a replacement questionnaire were mailed approximately 3 weeks and 11 weeks later, respectively, to nonresponding U. S. residents.

Phase 2 involved surveying persons who purchased a nonresident fishing license during 1986. A sample of 1,200 names, 1,137 U. S. residents and 63 residents of foreign countries was randomly drawn from the ADF&G nonresident fishing license file. Questionnaires were mailed in early December and a replacement questionnaire was mailed 6 weeks later to non-responding U. S. residents.

To increase participation, prizes were offered through a random drawing. The prizes included a night's lodging in Anchorage, a spinning rod and reel combination, a full-day and a half-day salmon trip on the Kenai River, a Talkeetna Canyon tour, a fly fishing rod and reel combination, and a 3-day/2-night fly-in trip to Lake Creek.

#### Business Sector Survey

The survey of businesses included an early season and an end-of-season survey.

Early Season Survey. The primary objective of the early season survey was to develop the sample of sport fishing-related businesses for the end-of-season survey. Information collected included: 1) the name, address, and phone number of the most appropriate person to contact for the end-of-season survey; 2) the type of business; 3) the percent of business related to sport fishing; 4) operational characteristics of the business (i.e., year-round, seasonal); 5) 1985 gross revenues; and 6) whether sport fishing licenses were sold by the vendor.

The sample of businesses for the early season survey was selected according to business type and geographical location. Based on discussions with industry representatives and anglers at the focus group sessions, the following types of sport fishing-related businesses were identified:

- o variety/department store
- o general sporting goods store
- o specialty fishing stores
- o hotels/motels
- o eating/drinking establishments
- o trailer park/campgrounds

- o transportation services (e.g., boats, air taxi operators, etc.)
- o fish packing/processing
- o fishing camp/lodge
- o travel or booking agent
- o marine/boats and accessories
- o guide business
- o local retail food and liquor stores
- o Other -- included in this category are manufacturer's representatives, taxidermists, and gun shops

To identify businesses of these types, the most current business list available from the State of Alaska Department of Revenue Business Licenses was used. Businesses were identified based on the standard industrial classification (SIC) listing. Geographical locations were then used to identify only those businesses located within the primary geographic confines of the sampling universe, which included the Southcentral study area and the roaded areas north to Fairbanks.

The list of SIC categories by 4-digit code used for drawing the sample is identified in Table 6-1. As indicated, some types of businesses were excluded in certain areas because of the indirect and remote connection with sport fishing.

The early season survey card was mailed in mid July to 3,785 businesses. Two weeks later a reminder card was mailed to all nonresponding businesses. Approximately 3 weeks after the reminder card, a replacement survey card was sent to those businesses which still had not responded.

End-of-Season Survey. The objective of the end-of-season survey was to obtain data from 200 sport fishing-related businesses needed to perform the economic impact analysis. The questionnaire (Appendix A) requested the following types of information: 1) type of business and products offered, 2) number of employees and payroll, 3) capital equipment purchases, 4) annual operating expenditures, and 5) annual sales.

The sample of vendors from the early season survey who indicated that their business was sport fishing-related was used to develop the sample for the end-of-season survey. The sample of 1,003 sport fishing-related businesses was first screened to identify those businesses that provided mostly guiding services -- i.e., that reported greater than 50 percent of their businesses was devoted to guiding. These businesses were removed from the business list and added to the list for the guide survey.

The sample for the end-of-season survey included 680 sport fishing-related businesses. Fifteen of these businesses were identified as "major" vendors of sport fishing goods and services.



Table 6-1. SIC Categories Used for Selecting the Sample  
for the Early Season Business Sector Survey

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Food and Kindred Products:

2091 Canned and Cured Seafoods  
2092 Fresh or Frozen Packaged Fish  
2097 Manufactured Ice

Water Transportation:

(Anchorage, Kenai Peninsula Bor., Mat-Su Borough only)

4140 Transportation, charter services  
4440 Transportation on rivers and channels  
4450 Local water transportation  
4459 Local water transportation, nec.  
4460 Water transportation services  
4469 Water transportation services, nec.

Air Transportation:

(Anchorage, Kenai Peninsula Bor., Mat-Su Borough only)

4510 Certified air transportation  
4520 Noncertified air transportation  
4580 Air transportation services  
4780 Misc. transportation services

Wholesale Trade Durable Goods:

5040/5041 Wholesale sporting goods

General merchandise stores:

5310 Department stores  
5330 Variety stores  
5399 Misc. general merchandise stores  
5312/5331 Unspecified

Food stores:

(Kenai Peninsula Borough, and Matanuska-Susitna Borough  
only)

5410/5411 Grocery stores

Table 6-1. SIC Categories Used for Selecting the Sample  
for the Early Season Business Sector Survey (Continued)

Automotive dealers and service station:

(Kenai Peninsula Borough, Mat-su Borough only for 5530 and 5540)

5530 Auto and home supply stores  
5540/5541 Gas service stations  
5550 Boat dealers

Eating and drinking places:

(Kenai Peninsula Borough, Mat-su Borough only)

5812/5800 Eating places  
5813 Drinking places

Miscellaneous Retail:

(Kenai Peninsula Borough and Mat-su Borough only for 5920)

5912 Drug stores  
5920 Liquor stores  
5941 Sporting goods stores  
5921/5940 Unspecified

Hotels and Other Lodging places:

(Anchorage, Kenai Peninsula Borough, Mat-su Borough only for 7010, 7020, and 7030)

7010 Hotels, motels, and tourist courts  
7020 Boarding houses and bed'n breakfasts  
7030 Camps and trailer parks  
7040 Membership only organizations  
7033 Unspecified  
7011/7022/7031/7032 Unspecified

Amusement and Other Recreation Services:

7990/7999 Misc. amusement, recreational services (most guiding services were found here).

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A questionnaire was mailed in mid November to all businesses in the sample. The 15 major vendors were telephoned thereafter to encourage participation. A copy of the "Executive Summary" of the study's findings was offered as an incentive for participation to all businesses. A follow-up reminder card was mailed 3 weeks later to nonresponding businesses. A replacement questionnaire was sent approximately 8 weeks after the reminder card to all businesses who still had not responded.

### Guide Sector Survey

The "universe" for the sport fishing guide survey included businesses or individuals who provided sport fishing assistance for compensation. As with the business sector survey, the survey of sport fishing guides included an early season and an end-of-season survey.

Early Season Survey. The primary objective of the early season survey was to identify "active" sport fishing guides and to collect other information needed for implementing the end-of-season survey. The information requested included the type of business operation, guiding activities in 1985, and plans for the 1986 season.

An early season survey card was mailed in early May to all "known guides" (described below). A follow-up reminder card was mailed approximately 2 weeks later. Attempts were subsequently made by phone to obtain the information from nonrespondents.

End-of-Season Survey. The objective of the end-of-season survey was to obtain data to profile the industry and to perform the economic impact analysis. With the exception of sport fishing guiding information (e.g., guide destination areas and specific guiding services offered), the information requested in the end-of-season survey was similar to that requested in the business survey.

The sample for the end-of-season survey consisted of two guide groups. The first group was "known guides" who had worked or expected to work in the project area in 1986. This core group of "known guides" included businesses or individuals whose names appeared on the following lists: the State of Alaska Department of Natural Resources list of Kenai River guides; the State of Alaska Department of Fish & Game guiding services list; the Alaska Buyer's Guide; membership list of the Kenai Guides Association; and membership list of the Alaska Professional Hunters Association.

The second sample group was drawn from the pool of respondents to the business survey. To identify sport fishing guides, the following question was asked in the business early season survey: "If the one category which best describes your business is guide business, what percentage of your annual gross revenues

comes from providing sport fishing guiding services?" The second group of guides consisted of those respondents who identified that "guide business" was the category that best described their business, and who stated that more than 50 percent of their gross annual income came from providing sport fishing guiding services.

End-of-season questionnaires (Appendix A) were mailed in early November to 297 guides. A copy of the "Executive Summary" of the study's findings was offered to encourage participation. A follow-up reminder card was mailed approximately 3 weeks later to all nonrespondents. A replacement questionnaire was mailed in mid January to guides who still had not responded.



## Chapter 7

### DATA PROCESSING AND SAMPLE DESCRIPTIONS

#### Data Processing Procedures

Data processing involved converting questionnaire responses to numerical data files ready for analysis. This process included three main tasks, each of which is described more completely in the following sections:

- o data screening and interpretation,
- o data coding and entry, and
- o data formatting and verification.

Except for specific details, all of the various questionnaires were processed in the same manner.

#### Data Screening and Interpretation

The questionnaires returned were systematically evaluated and cleaned prior to being coded and entered onto data files. This process involved three major steps:

- 1) scan questionnaires, looking for omissions and problem areas;
- 2) categorize and sort questionnaires according to the type(s)-of problems identified; and
- 3) clean and finalize the questionnaires.

These procedures are described more fully below. The logic used for much of the cleaning of questionnaires (Step 3) is described in detail in a supplemental problems report.

Scan Questionnaires. Each questionnaire was scanned to determine the extent of response problems, including omissions. Most questionnaires were partially incomplete. After scanning a small sample, it was evident that each type of questionnaire had particular problem areas. This detection expedited scanning of subsequent questionnaires.

Categorize Questionnaires by Type of Problem. Because questionnaires had particular problem areas, categories of problem types were developed. Questionnaires were then assigned

to a category corresponding with type (or types) of problems identified. For the business and guide sector surveys, only "blank" and "other" categories were used. Categorizing the angler surveys, however, was more involved.

The categories for the angler questionnaires ranged from "1" (complete, as is) to "10" (missing pages). The other categories represented different levels of completeness. For certain categories, reference to the problem section was indicated. This classification system was used to facilitate cleaning of the questionnaires.

Clean Questionnaires. This final step involved closely examining designated problem areas in the questionnaire. The primary objective was to include as much useful data as possible from each questionnaire. Because certain data, however, were considered critical to the analysis, the cleaning focused on those areas.

The major cleaning effort was directed to the resident angler surveys. The request for detailed information in a relatively complex format resulted in the need for considerable interpretation and restructuring of responses. Where reasonable, missing data were completed by inferring from other responses. The logic used for this interpretation is described in the supplemental problems report. Once "cleaned," the questionnaires were sent on for coding and entry.

### Data Coding and Entry

Both an initial format and a final coding format were prepared for each type of questionnaire. Initial coding formats were designed to ease manual coding and data entry, while final coding formats were designed to facilitate computer-aided data retrieval. Specially designed software, described in the following section on data verification procedures, converted the data as entered manually to final formats.

An example illustrates the difference between the two formats. One set of information obtained from Questionnaire I of the resident angler survey (question 2 on page 3 of that questionnaire) included a list of 80 sites for which the respondent answered 1 for "Often", 2 for "Seldom," and 3 for "Never" depending on how often members of the respondent's household visited the site. Few households visited more than several sites, so that 3 was the usual response, with 1s and 2s mixed in. Manual entry of the 80 individual responses was considered inefficient. Instead, these data were coded and entered with a "repeater" code, any negative number X, indicating that the number following should be repeated in the sequence X times. In the extreme case of all sites "Never" visited, the data would be coded as "-80,3" instead of "3,3,3,...,3" with 76 more 3s and commas where the "..." appears. Such a procedure not only eases

the processing task, but also is less prone to error. For computer legibility, however, the data were stored as 80 separate values. The specially designed software converted the shortcut-coded data to an appropriate format in later processing.

Similar techniques were used throughout the data coding and entry procedures. In the Trip Log of the resident angler survey, for instance, the data for one trip could include separate information on one to four different sites. Initial coding and data entry are simpler if, in an instance where just one site is visited, only data from one site are coded. The data are more readable universally, however, if all four records of information are stored, even though three of the records are not useful. A specially designed program fills out the data with three extra records of zeros, serving as the link between the two coding optima.

A number of data files were created for each survey. The resident angler survey data are stored in eight different types of files as follows:

- 1) Questionnaire I (QI) Subject file - contains all QI data except the Trip Log and the Site Record. This subject file does indicate, however, the number of trips for the subject in the Trip file and the associated number of site records in the Site file.
- 2) Questionnaire II (QII) Subject file - contains all QII data except the Trip Log, Site Record, Expenses Information, and King Salmon valuation responses. In addition to containing keys to the numbers of trips and sites for the subject in those files, this subject file also indicates whether the Expenses Information is of Type A or Type B.
- 3) Combination Questionnaire (Combo) Subject file - contains all Combo data except the Trip Log, Site Record, Expenses Information, and king salmon valuation responses. This file also contains the codes to trip, site, and expenses files described above.
- 4) Trip Files - contain all of the Trip Log information from QI, QII, and Combo questionnaires. There are as many trips for each subject in these files as is indicated for the subject in the subject files.
- 5) Site Files - contain all of the Site Record information of the QI, QII, and Combo questionnaires.
- 6) Type A Expenses Files - contain the expenses information from those subjects responding to QII or the Combo questionnaire that detailed their expenses by type of commodity purchased.



- 7) Type B Expenses Files - contain expenses information from those QII and Combo subjects who detailed their expenses by type of business.
- 8) King Files - contain responses to the valuation questions in the QII and Combo questionnaires focusing on king salmon fishing.

The nonresident (NR) angler data are stored in five different types of files, as follows:

- 1) NR Subject File - contains all of the information in the NR angler questionnaire except the Trip Record information (including data on sites visited and expenses incurred during the trip). This file also indicates whether trip record information exists for each subject in the trip file.
- 2) NR Trip File - contains all details of trips recorded by the nonresidents, except the site-specific information and the expenses data. The file does indicate for each subject, however, the number of sites detailed in the Site File and the version (Type A or B) of the expenses data recorded.
- 3) NR Site File - contains all the site-specific data recorded by nonresidents.
- 4) NR Type A Expenses File - contains expenses information from subjects who detailed their spending by type of commodity purchased.
- 5) NR Type B Expenses File - contains expenses data for subjects recording their expenses in terms of the business types from which purchases were made.

Sport fishing-related businesses and guides data are stored in three types of files as follows:

- 1) Business File - contains nearly all of the information in the business sector questionnaires -- all except the detailed data on individual capital equipment purchases (Section II, parts A and B, pages 2 and 3 of the questionnaire). Summary data on transportation-related equipment purchases and on other equipment purchases, calculated from the detailed data to reflect annual costs for these items, are stored in this file along with a key to the number of detailed records for each subject in the Equipment Files.
- 2) Guide File - contains all of the information from the guide questionnaire except the data on individual capital equipment purchases. Summary data reflecting annual costs of these equipment acquisitions are stored here, as are keys

to the Equipment files, and is similar to the Business file.

- 3) Equipment Files - contain the detailed information on purchases of capital equipment. Although identical in format, individual Equipment files store these data separately for the businesses and the guides.

Detailed lists of the contents of all these file types, and the final formats of the data in these files, are contained in the supplemental problems report.

Codes were prepared in one of two ways for all missing data in these files. For the most part, where the questionnaires called for responses keyed to positive integers (e.g., "1" for "male" and "2" for "female", or "4" for "high school graduate" and "7" for "college degree," etc.), a missing response is coded as a zero. In situations where zero is a possible response, however, such as the cost of guide fees to a subject on a given trip, a missing response is coded as negative one (-1). The latter code requires two storage spaces in the final format instead of one space, which zero requires, and for this reason it is not used universally as a missing data code.

#### Data Formatting and Verification

Following initial coding and manual data entry, the data were subjected to a sequence of verification procedures coincident with final formatting. First, the raw data files were printed and visually scanned for comparison with the questionnaires. This first verification step simultaneously revealed both mistakes made during initial coding and typographical errors during data entry. This procedure eliminated more errors than did other steps.

After editing to correct for mistakes found visually, the raw data files were input to custom BASIC programs. These programs were designed to expand the shortcut-coded data to formats similar to those of the final products. The BASIC language was used because it is structured to input data one piece of information at a time, rather than as a whole record of information; it therefore provides a straightforward way to process repeater codes.

The BASIC programs also counted the number of data items stored for each subject, and tested the validity of selected codes. Through interaction with the operator, incomplete, redundant, or invalid information was revealed. Errors in those portions of the raw data files were compared again to the questionnaires and were corrected accordingly. The intermediate data files resulting from this second step in the verification process contain complete details on each subject; however, the

files are not precisely in the final format because formatting in BASIC is unwieldy.

In the third step, custom FORTRAN programs are used to format the intermediate files. The resultant formatted files are as compact as possible (e.g., a sequence of single-digit values are stored in consecutive spaces); data items that are an order of magnitude more would not fit. In such cases, FORTRAN prints asterisks in positions corresponding to data that do not fit. A computer search for asterisks in these formatted files reveals such data errors. Again the data are compared to the questionnaires, when asterisks appear, and they are corrected as necessary.

In the fourth, but not necessarily final step, the data are sorted by subject identification number and inventoried. The purpose of these inventories, in addition to providing a record of data contents, is to check the correspondence between associated files. Files associated with QI of the resident angler survey, for example, include subject, trip, and site files. An inventory of the QI subject file lists the subject's ID, the number of trips his/her household made, and the sites detailed. Comparison of that inventory to the corresponding trip and site file inventories ensures that all trip and site information is recorded. This step is repeated as many times as necessary to ensure correspondence, with data editing also performed. Some corrections involved the raw data files, and steps 2 through 4 would be repeated.

The ultimate data files are "clean," in the sense of computer readability. All of the information that should be in the files is included. No extraneous data are present, and corresponding files match. Furthermore, because the data are compared to the original questionnaires at each stage, it is likely that nearly all data perfectly reflect the responses to those questionnaires. These files are stored in duplicate on PC-DOS formatted 360k, 5.25-inch diskettes.

### Sample Descriptions

The following section describes characteristics of the resident angler, nonresident angler, business sector, and guide sector samples.

#### Resident Angler Survey

The resident angler survey included a preseason survey card and three questionnaires -- QI and QII, and the Combo. QI covered summer sport fishing between May and July, and also winter fishing (November through April). QII covered summer sport fishing in August and September. The Combo covered

the entire summer sport fishing season, but not the winter season.

As shown in Table 7-1, the sample consists of 3,842 respondents to the survey card, 1,110 respondents to QI, 695 respondents to QII, and 593 respondents to the Combo. Key summary statistics from the preseason survey are presented in Table 7-2.

The distribution of respondents to the resident angler questionnaires by origin area is shown in Table 7-3. The trips reported by these respondents were characterized around four strata: week fished, length of trip, species sought, and sites visited.

Table 7-4 shows the target species distribution. The most sought-after species was king salmon, which was the target species for 19.3 percent of all trips. There were 738 trips reported with no target species.

Table 7-5 shows the distribution of trips by week over the 22-week summer fishing period. These data show a steady increase through July, a sudden decrease at the beginning of August, followed by a gradual decline through September. Table 7-6 shows the distribution of trips by length of trip.

Table 7-7 shows the distribution of summer fishing trips by site visited. A total of 7,346 trips were reported by resident anglers over the May-September period. (This total number of trips is less than total trips in Table 7-4 in which each target species reported on a multiple species trip was counted as a trip.) The mean number of trips per household was 4.3. Of the 7,346 trips taken, 730 were made to sites within the Fairbanks area, which reflects the local fishing pattern of Fairbanks residents in the sample.

As shown in Table 7-8, over 24 percent of the respondents to QI reported having taken at least one fishing trip between November 1985 and April 1986. The site reported most frequently was Big Lake.

#### Nonresident Angler Survey

As shown in Table 7-1, the sample consists of 867 out-of-state persons who purchased a nonresident's fishing license between 1983 and 1986. U. S. residents comprised 833, or 95.2 percent of the respondents; residents of foreign countries comprised 42, or 4.8 percent. The breakdown of respondents by the year in which the license was purchased includes 106 from 1983, 118 from 1984, 126 from 1985, and 517 from 1986.

The distribution of respondents by state or country of origin is shown in Table 7-9. The most recent trip reported by

Table 7-1.. Survey Response, by Type of Survey

Type of Survey	Mailed	Delivered	# Returned	% Returned (of those delivered)	# Processed (Sample)
Resident Angler					
o Survey card	7,500	6,685	3,842	57.5	3,842
o Questionnaire I (QI)	3,200	3,200	1,129	35.3	1,110
o Questionnaire II (QII)	1,082	1,082	700	64.7	695
o Combination (Combo)	1,982	1,982	593	29.9	593
Nonresident Angler					
o Group 1 (1983-1985)					
- U. S.	860	775	318	41.0	316
- International	244	204	34	16.7	34
o Group 2 (1986)					
- U. S.	1,137	1,067	580	54.4	509
- International	63	54	8	14.8	8
Business Sector					
o Early season card	3,785	3,581	1,721	48.1	1,717
o End-of-season questionnaire	680	680	289	42.5	220
Guide Sector					
o Early season card	314	269	187	69.5	187
o End-of-season questionnaire	297	297	101	34.0	99

Table 7-2. Sample Characteristics from the Resident  
Angler Preseason Survey (3,842 respondents)

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1) Number of household members	
a) 18 and under	0.9 persons (mean)
b) over 18	1.9 persons (mean)
2) Number of years lived in Alaska	15.5 years (mean)
3) Fished in Alaska during the last 3 years	80.1 %
4) Fished in Alaska during the last winter (November 1985 through April 1986)	22.1 %
5) Expect to fish in Alaska between May and September of 1986	77.2 %
6) For anglers from previous years who do not expect to fish in 1986, primary reason:	
a) not in Alaska	9.8 %
b) too busy	49.7 %
c) bad previous fishing experience	20.7 %
d) use money for other things	19.7 %

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Table 7-3. Distribution of Respondents to the  
Resident Angler Survey by Zip Code and Location

Three-Digit Zip Code	Location	Number of Respondents
501-520	Anchorage	913
556	Anchor Point	9
568	Clam Gulch	3
571	Cold Bay	1
572	Cooper Landing	1
577	Eagle River	4
588	Glennallen	6
603	Homer	55
609	Kasigluk	1
610	Kasilof	7
611	Kenai	44
631	Moose Pass	2
635	Nikiska	10
639	Ninilchik	7
645	Palmer	68
652	Big Lake	11
663	Seldovia	3
664	Seward	19
669	Soldotna	67
672	Sterling	8
674	Sutton	4
676	Talkeetna	7
683	Trapper Creek	1
687	Wasilla	105
688	Willow	12
701-775	Fairbanks	325
No zip code		<u>10</u>
TOTAL		1,703

Table 7-4. Distribution of Resident Angler Trips  
by Target Species

	Number of Trips for Species*	Percent of Total
NO TARGET SPECIES	738	9.5
King salmon	1,504	19.3
Small king salmon	68	0.9
Red salmon	614	7.9
Silver salmon	1,178	15.1
Pink salmon	200	2.6
Chum salmon	34	0.4
Land-locked salmon	89	1.1
Steelhead trout	22	0.3
Rainbow trout	826	10.6
Cutthroat trout	4	0.1
Brook trout	6	0.1
Lake trout	264	3.4
Dolly Varden	256	3.3
Arctic char	9	0.1
Northern pike	132	1.7
Arctic grayling	577	7.4
Shellfish	9	0.1
Whitefish	20	0.3
Burbot	45	0.6
Smelt/hooligan/capelin	21	0.3
Rockfish/sea bass	64	0.8
Halibut	823	10.6
Other fin fish	33	0.4
Razor clams	224	2.9
Other shellfish	24	0.3
TOTAL	7,784	100.1

\* Each target species reported on a multiple species/multiple site trip is counted as a trip.



Table 7-5. Distribution of Resident Angler Trips by Week

Week	Number of Trips	Cumulative Percent of Total
May 1 - May 7	83	1.2
May 8 - May 14	95	2.6
May 15 - May 21	179	5.2
May 22 - May 28	294	9.5
May 29 - June 4	322	14.3
June 5 - June 11	435	20.6
June 12 - June 18	495	27.9
June 19 - June 25	488	35.0
June 26 - July 2	534	42.8
July 3 - July 9	569	51.2
July 10 - July 16	441	57.6
July 17 - July 23	474	64.6
July 24 - July 30	517	72.2
July 31 - August 6	311	76.7
August 7 - August 13	300	81.1
August 14 - August 20	297	85.5
August 21 - August 27	267	89.4
August 28 - September 3	220	92.6
September 4 - September 10	163	95.0
September 11 - September 17	155	97.2
September 18 - September 24	120	99.0
September 25 - October 1	68	100.0
TOTAL TRIPS	6,827	

Table 7-6. Distribution of Resident Angler  
Trips by Length of Trip

Duration	Number of Trips	Percent of Total
Trips less than 1 day (i.e., 24 hours)	3,594	52.7
1 day $\leq$ length $<$ 2 days	1,153	16.9
2 days $\leq$ length $<$ 3 days	1,181	17.3
3 days $\leq$ length $<$ 4 days	402	5.9
4 days $\leq$ length $<$ 5 days	168	2.5
5 days $\leq$ length $<$ 6 days	89	1.3
6 days $\leq$ length $<$ 7 days	51	0.7
7 days $\leq$ length $<$ 8 days	43	0.6
8 days $\leq$ length $<$ 9 days	27	0.4
9 days $\leq$ length $<$ 10 days	34	0.5
10 days $\leq$ length $<$ 11 days	12	0.2
11 days $\leq$ length $<$ 12 days	9	0.1
12 days $\leq$ length $<$ 13 days	5	0.1
13 days $\leq$ length $<$ 14 days	3	0.4
Trips more than 14 days	20	0.3
TOTAL TRIPS*	6,816	

\*Note: Total trips does not equal the number shown in Table 8-5 because some respondents did not report dates and some trips were of unknown duration.

Table 7-7. Distribution of Resident Angler Trips by Site  
(7,346 total trips)\*

# of Trips to Site	Percent of Total	Area Code	Name of Area/Site	Area Code	Name of Area/Site	# of Trips to Site	Percent of Total
<u>SOUTHCENTRAL ALASKA</u>							
<u>Glennallen Area</u>				<u>Kenai Peninsula Area (Contd.)</u>			
88	1.2	I-1	Gulkana River (Paxson-Sourdough)	P-4	Kenai River (Skilak Inlet to Kenai Lake)	171	2.3
31	0.4	I-2	Gulkana River (Sourdough-Highway)	P-5	Skilak Lake	26	0.4
17	0.2	I-3	Gulkana River (Other)	P-6	Kenai Lake	23	0.3
73	1.0	I-4	Tyone, Susitna, Louise Lakes	P-7	Russian River	213	2.9
136	1.9	I-5	Other freshwater sites	P-8	Kasilof River	185	2.5
				P-9	Ninilchik River	47	0.6
				P-10	Anchor River	212	2.9
			<u>Prince William Sound</u>	P-11	Deep Creek (freshwater)	70	1.0
83	1.1	J-1	Valdez Bay	P-12	Other freshwater sites	220	3.0
23	0.3	J-2	Passage Canal (Whittier)	P-13	Deep Creek (saltwater)	273	3.7
87	1.2	J-3	Other saltwater sites	P-14	Kachenak Bay (Homer)	486	6.6
29	0.4	J-4	Freshwater sites	P-15	Resurrection Bay (Seward)	402	5.5
				P-16	Shoreline (Kasilof to Anchor Point:Razor Clams)	68	0.9
			<u>Knik Arm Drainage Area</u>				
216	2.9	K-1	Little Susitna River	P-17	Other shoreline sites	75	1.0
31	0.4	K-2	Knik River	P-18	Other saltwater sites	99	1.3
41	0.6	K-3	Wasilla and Cottonwood Creeks				
79	1.1	K-4	Big Lake	<u>SOUTHWESTERN ALASKA</u>			
65	0.9	K-5	Kepler Complex	<u>Kodiak Area</u>			
37	0.5	K-6	Finger Lake	Q-1	Freshwater sites	40	0.5
30	0.4	K-7	Wasilla Lake	Q-2	Saltwater sites	32	0.4
226	3.1	K-8	Other freshwater sites				
2	0	K-9	Saltwater sites		<u>Naknek Area</u>		
				R-1	Naknek River	18	0.2
			<u>Anchorage Area</u>	R-2	Other freshwater sites	10	0.1
126	1.7	L-1	Anchorage Area Lakes	R-3	Saltwater sites	2	0
54	0.7	L-2	Bird Creek				
21	0.3	L-3	Campbell Creek	<u>Kvichak River Drainage Area</u>			
22	0.3	L-4	Twentymile River	S-1	Lake Iliamna and tributaries	29	0.4
74	1.0	L-5	Other freshwater sites	S-2	Other freshwater sites	2	0
9	0.1	L-6	Saltwater sites				
			<u>East Side Susitna Drainage Area</u>	T-1	<u>Nushagak Area</u>		
54	0.7	M-1	Clear Creek	T-2	Wood River/Tikchik System	12	0.2
127	1.7	M-2	Montana Creek	T-3	Other freshwater sites	3	0
32	0.4	M-3	Caswell Creek		Saltwater sites	-	0
116	1.6	M-4	Willow Creek/Little Willow Creek	<u>SOUTHEASTERN ALASKA</u>			
215	2.9	M-5	Other freshwater sites	A	Ketchikan Area	5	0.1
				B	Prince of Wales Area	2	0
			<u>SOUTHCENTRAL ALASKA</u>	C	Kake/Petersburg/Wrangell/Stikine Area	2	0
			<u>West Side Cook Inlet/West Side Susitna Drainage Area</u>	D	Sitka Area	9	0.1
124	1.7	N-1	Deshka River-Kroto Creek				
66	0.9	N-2	Lake Creek		<u>Juneau Area</u>		
38	0.5	N-3	Alexander Creek	E-1	Saltwater sites	6	0.1
19	0.3	N-4	Talachulitna River	E-2	Freshwater sites	2	0
32	0.4	N-5	Chuitna River	F	Haines-Skagway Area	6	0.1
60	0.8	N-6	Theodore, Lewis, and Ivan Rivers	G	Glacier Bay Area	1	0
191	2.6	N-7	Other freshwater sites	H	Yakutat Area	8	0.1
14	0.2	N-8	Saltwater sites				
			<u>Kenai Peninsula Area</u>	U	<u>OTHER ALASKA</u>		
651	8.9	P-1	Kenai River (Cook Inlet to Soldotna Bridge)	V	Fairbanks Area	730	9.9
222	3.0	P-2	Kenai River (Soldotna Bridge to Moose River)	W	Lower Yukon/Kuskokwim Area	47	0.6
138	1.9	P-3	Kenai River (Moose River to Skilak Outlet)	X	Seward Peninsula/Norton Sound Area	21	0.3
				Y	Northwest Alaska Area	24	0.3
				Z	South Slope Brooks Range Area	40	0.5
					North Slope Brooks Range Area	26	0.4

\* A trip is defined by a site visit.

Table 7-8. Winter Fishing  
(November through April)

Total Sample	1,110 respondents
Number of respondents who participated in winter fishing (November-April)	270 (24.3%)
Mean number of sites visited per participant	1.8
Mean number of trips per participant	5.6
Number of different sites reported	180
<u>10 Most Frequently Reported Sites</u>	<u>Number of Households Visiting the Site</u>
Big Lake	47
Quartz Lake <sup>1</sup>	29
Birch Lake <sup>1</sup>	24
Finger Lake	23
Lake Louise	23
Kenai River	12
Jewel Lake	11
Hidden Lake	10
Johnson Lake	9
Kepler Lake	7

<sup>1</sup> Not located within southcentral Alaska study area.

Table 7-9. Distribution of Nonresident Anglers  
by State or Country of Origin

Area of Origin	Number of Respondents
United States	
- Alabama	5
- Arizona	20
- Arkansas	3
- California	126
- Colorado	38
- Connecticut	4
- District of Columbia	1
- Delaware	1
- Florida	19
- Georgia	7
- Hawaii	5
- Idaho	23
- Illinois	17
- Indiana	8
- Iowa	8
- Kansas	7
- Kentucky	3
- Louisiana	4
- Maine	3
- Maryland	3
- Massachusetts	4
- Michigan	22
- Minnesota	27
- Mississippi	1
- Missouri	2
- Montana	28
- Nebraska	4
- Nevada	12
- New Hampshire	3
- New Jersey	8
- New Mexico	8
- New York	13
- North Carolina	13
- North Dakota	1
- Ohio	12
- Oklahoma	6
- Oregon	61
- Pennsylvania	14
- Rhode Island	--
- South Carolina	2
- South Dakota	3
- Tennessee	6
- Texas	41
- Utah	16

Table 7-9. Continued

Area of Origin	Number of Respondents
- Vermont - Virginia - Washington - West Virginia - Wisconsin - Wyoming	2 9 146 1 19 <u>10</u>
Subtotal	799
Canada Finland France Germany Italy Japan Netherlands New Zealand Norway South Africa Sweden Switzerland United Kingdom	21 1 2 3 1 2 1 2 2 1 2 2 <u>1</u>
Subtotal	42
No Origin Area	26
Total	867

each respondent was characterized around two strata: species sought and sites visited.

Table 7-10 shows the distribution of target species for the sites visited. King salmon was the most sought-after species, being reported as the target species at 28.5 percent of the sites visited. Trips to sites without a target species represented 9.5 percent of all site visits.

Table 7-11 shows the distribution of sites visited by location. Of the 1,614 site visits, 158 were made to the lower Kenai River, more than to any other site; a total of 332 trips were made to all parts of the Kenai River. The second most popular site was Kachemak Bay.

#### Business Sector Survey

As shown in Table 7-1, the sample consists of 1,717 respondents to the early season survey and 220 respondents to the end-of-season questionnaire. The sample from the early season survey included 731 businesses, or 46 percent reporting sport fishing-related income and 859 business, or 54 percent reporting no sport fishing-related income. One hundred and twenty-seven (127) cards were returned without providing this information.

The sample from the end-of-season questionnaire consists of 101 Anchorage area businesses, 48 businesses in the Kenai Peninsula area, and 66 businesses elsewhere in southcentral Alaska. Two of the businesses in the sample have mailing addresses outside Alaska, and the origins of three others are unknown. Table 7-12 shows the makeup of the sample by these areas and by type of business. All of the business types, except fish packing/processing establishments, are represented. A total of 21 businesses categorized themselves as some type other than the ones listed, and 19 businesses claimed to be associated with more than one of these categories.

Table 7-13 shows the number of businesses by area reporting operating expenses in their own areas. This information is important in assessing the accuracy of the input-output coefficients used in the economic impact analysis (see Chapter 8). Of the 65 Anchorage area businesses reporting operating expenses, 60 reported local spending including most business types represented in the sample. Of the 42 Kenai Peninsula businesses reporting these expenses, all reported local spending. Of the 56 other Alaska businesses, 39 reported local spending.

A summary of this spending is shown in Table 7-14. Average operations expenditures in the Anchorage area, the Kenai Peninsula, the Juneau area, other Alaska, and outside Alaska are shown for the sample of businesses by geographical location. The table also shows the number of businesses reporting expenditures by area, and the standard deviation of the spending.

Table 7-10. Distribution of Nonresident Angler Trips,  
by Target Species

	Number of Trips by Species*	Percent of Total
NO TARGET SPECIES	166	9.5
King salmon	500	28.5
Small king salmon	14	0.8
Red salmon	150	8.5
Silver salmon	315	17.9
Pink salmon	53	3.0
Chum salmon	6	0.3
Land-locked salmon	1	0.1
Steelhead trout	17	1.0
Rainbow trout	99	5.6
Cutthroat trout	11	0.6
Brook trout	2	0.1
Lake trout	24	1.4
Dolly Varden	48	2.7
Arctic char	10	0.6
Northern pike	12	0.7
Arctic grayling	42	2.4
Shellfish	0	0.0
Whitefish	1	0.1
Burbot	2	0.1
Smelt/hooligan/capelin	1	0.1
Rockfish/sea bass	8	0.5
Halibut	238	13.6
Other fin fish	3	0.2
Razor clams	23	1.3
Other shellfish	7	0.4
TOTAL	1,753	100.0

\* A trip is defined by a site visit.



Table 7-11. Distribution of Nonresident Angler Trips by Site  
(1,614 total trips)\*

# of Trips to Site	Percent of Total	Area Code	Name of Area/Site	Area Code	Name of Area/Site	# of Trips to Site	Percent of Total
<u>SOUTHCENTRAL ALASKA</u>							
<u>Glennallen Area</u>				<u>Kenai Peninsula Area (Contd.)</u>			
3	0.2	I-1	Gulkana River (Paxson-Sourdough)	P-4	Kenai River (Skilak Inlet to Kenai Lake)	29	1.8
0	0	I-2	Gulkana River (Sourdough-Highway)	P-5	Skilak Lake	0	0
6	0.4	I-3	Gulkana River (Other)	P-6	Kenai Lake	1	0.1
3	0.2	I-4	Tyone, Susitna, Louise Lakes	P-7	Russian River	47	2.9
26	1.6	I-5	Other freshwater sites	P-8	Kasilof River	16	1.0
			<u>Prince William Sound</u>	P-9	Ninilchik River	16	1.0
				P-10	Anchor River	21	1.3
23	1.4	J-1	Valdez Bay	P-11	Deep Creek (freshwater)	16	1.0
2	0.1	J-2	Passage Canal (Whittier)	P-12	Other freshwater sites	30	1.9
12	0.7	J-3	Other saltwater sites	P-13	Deep Creek (saltwater)	28	1.7
18	1.1	J-4	Freshwater sites	P-14	Kachemak Bay (Homer)	127	7.9
			<u>Knik Arm Drainage Area</u>	P-15	Resurrection Bay (Seward)	47	2.9
				P-16	Shoreline (Kasilof to Anchor Point: Razor Clams)	22	1.4
20	1.2	K-1	Little Susitna River	P-17	Other shoreline sites	6	0.4
4	0.2	K-2	Knik River	P-18	Other saltwater sites	14	0.9
2	0.1	K-3	Wasilla and Cottonwood Creeks				
3	0.2	K-4	Big Lake	<u>SOUTHWESTERN ALASKA</u>			
0	0	K-5	Kepler Complex	<u>Kodiak Area</u>			
1	0.1	K-6	Finger Lake	Q-1	Freshwater sites	25	1.5
1	0.1	K-7	Wasilla Lake	Q-2	Saltwater sites	16	1.0
15	0.9	K-8	Other freshwater sites				
0	0	K-9	Saltwater sites	<u>Naknek Area</u>			
			<u>Anchorage Area</u>	R-1	Naknek River	20	1.2
				R-2	Other freshwater sites	18	1.1
7	0.4	L-1	Anchorage Area Lakes	R-3	Saltwater sites	4	0.2
2	0.1	L-2	Bird Creek				
3	0.2	L-3	Campbell Creek	<u>Kvichak River Drainage Area</u>			
0	0	L-4	Twentymile River	S-1	Lake Iliamna and tributaries	13	0.8
13	0.8	L-5	Other freshwater sites	S-2	Other freshwater sites	19	1.2
2	0.1	L-6	Saltwater sites				
			<u>East Side Susitna Drainage Area</u>	T-1	Wood River/Tikchik System	10	0.6
2	0.2	M-1	Clear Creek	T-2	Other freshwater sites	9	0.6
3	0.6	M-2	Montana Creek	T-3	Saltwater sites	3	0.2
0	0	M-3	Caswell Creek				
14	0.9	M-4	Willow Creek/Little Willow Creek	<u>SOUTHEASTERN ALASKA</u>			
10	0.6	M-5	Other freshwater sites	A	Ketchikan Area	71	4.4
			<u>SOUTHCENTRAL ALASKA</u>	B	Prince of Wales Area	40	2.5
			<u>West Side Cook Inlet/West Side Susitna Drainage Area</u>	C	Kake/Petersburg/Wrangell/Stikine Area	43	2.7
				D	Sitka Area	47	2.9
13	0.8	N-1	Deshka River-Kroto Creek				
4	0.2	N-2	Lake Creek	<u>Juneau Area</u>			
7	0.4	N-3	Alexander Creek	E-1	Saltwater sites	70	4.3
2	0.1	N-4	Talachulitna River	E-2	Freshwater sites	10	0.6
1	0.1	N-5	Chuitna River	F	Haines-Skagway Area	68	4.2
0	0	N-6	Theodore, Lewis, and Ivan Rivers	G	Glacier Bay Area	12	0.7
15	0.9	N-7	Other freshwater sites	H	Yakutat Area	36	2.2
1	0.1	N-8	Saltwater sites				
			<u>Kenai Peninsula Area</u>	<u>OTHER ALASKA</u>			
158	9.8	P-1	Kenai River (Cook Inlet to Soldotna Bridge)	U	Fairbanks Area	48	3.0
111	6.9	P-2	Kenai River (Soldotna Bridge to Moose River)	V	Lower Yukon/Kuskokwim Area	25	1.5
34	2.1	P-3	Kenai River (Moose River to Skilak Outlet)	W	Seward Peninsula/Norton Sound Area	15	0.9
				X	Northwest Alaska Area	9	0.6
				Y	South Slope Brooks Range Area	5	0.3
				Z	North Slope Brooks Range Area	10	0.6

\* A trip is defined by a site visit; the total number does not include 139 trips without a site identified.

Table 7-12. Number of Business Surveys by Area and Type

Business Type	Mailing Address					Total
	Anchorage	Kenai	Other AK	Outside	Missing	
Missing	1	0	3	0	1	5
Variety	3	1	3	0	1	8
Gen Sport	5	0	6	0	0	11
Spec Fish	3	6	3	0	0	12
Hotel/Motel	7	4	4	0	0	15
Eat Drink	0	0	2	0	0	2
Trailer Park	0	0	1	0	0	1
Tran Svcs	26	10	5	1	0	42
Fish Camp	12	5	8	0	1	26
Trav Agent	5	0	0	0	0	5
Boat Bsns	9	3	2	0	0	14
Guide	16	4	12	1	0	33
Food/Liquor	1	3	2	0	0	6
Other	6	6	9	0	0	21
Multiple	7	6	6	0	0	19
TOTAL	101	48	66	2	3	220

Table 7-13. Local Operations Spending, by Type and Location of Business

Business Type	Anchorage Businesses Spending in the Anchorage Area			Kenai Area Businesses Spending in Kenai Peninsula			Other Businesses in the Survey Area Spending in Other Alaska		
	None	Some	Total	None	Some	Total	None	Some	Total
Variety	0	2	2	0	1	1	0	2	2
Gen. Sport	1	3	4	0	0	0	2	4	6
Spec. Fish	0	2	2	0	6	6	0	3	3
Hotel/Motel	0	2	2	0	4	4	2	0	2
Eat/Drink Est.	0	0	0	0	0	0	1	1	2
Trailer Park/Camp.	0	0	0	0	0	0	1	0	1
Trans. Services	1	19	20	0	10	10	1	3	4
Fishing Lodge	1	10	11	0	5	5	0	7	7
Travel Agent	0	1	1	0	0	0	0	0	0
Boat Business	0	6	6	0	2	2	0	2	2
Guide Business	1	8	9	0	2	2	3	7	10
Food/Liquor	0	0	0	0	3	3	1	1	2
Other	1	3	4	0	5	5	3	5	8
Multiple	0	3	3	0	4	4	3	2	5
Missing	0	1	1	0	0	0	0	2	2
TOTAL SAMPLE	5	60	65	0	42	42	17	39	56

Table 7-14. Summary of Operations Spending, by Business Location

Spending Area	Anchorage Area Addresses			Kenai Peninsula Addresses			Addresses Elsewhere in the Survey Area		
	# of Obs.	Mean Expenditures	Standard Deviation	# of Obs.	Mean Expenditures	Standard Deviation	# of Obs.	Mean Expenditures	Standard Deviation
Anchorage	65	\$169,613	\$974,717	42	\$46,148	\$96,520	56	\$55,339	\$152,084
Kenai River	64	3,818	17,057	42	51,515	91,785	56	386	2,496
Juneau Area	63	218	1,001	42	1,565	7,822	56	22	87
Other Alaska	63	56,177	392,906	42	192	669	56	41,355	109,008
Outside Alaska	63	62,647	380,035	42	52,164	159,595	56	18,491	76,472
TOTAL	84	\$228,228	\$1,379,968	45	\$163,405	\$334,682	61	\$106,895	\$245,610

## Guide Sector Survey

As shown in Table 7-1, the sample consists of 187 respondents to the early season survey and 99 respondents to the end-of-season survey. The sample from the early season survey included 131 guides, or 70 percent who expected to provide sport fishing guides services in 1986 and 56 guides, or 30 percent, who did not plan to provide these services in 1986.

The sample of guide businesses from the end-of-season survey includes 29 with mailing addresses in the Anchorage area, 44 in the Kenai Peninsula, and 20 in other areas of Alaska. Three guides had mailing addresses outside Alaska, and the origins of three others are unknown.

Table 7-15 summarizes the operations expenditures of the guides with Alaska addresses. The Anchorage area guides apparently operate larger businesses on the average than the guides from other areas of the state. These Anchorage guides averaged more than \$74,000 in operations expenditures during the year, compared to an average of less than \$33,000 for Kenai Peninsula guides, and less than \$19,000 for other guides. As the table indicates, the greatest portion of these expenditures is made in the guides' home regions. Substantial expenditures also are made outside the state by all groups.

Table 7-15. Summary of Operations Spending, by Guide Location

Spending Area	Anchorage Area Addresses			Kenai Peninsula Addresses			Addresses Elsewhere in the Survey Area		
	# of Obs.	Mean Expenditures	Standard Deviation	# of Obs.	Mean Expenditures	Standard Deviation	# of Obs.	Mean Expenditures	Standard Deviation
Average total spending	28	\$74,218	\$204,494	39	\$32,758	\$59,432	19	\$18,963	\$25,593
Average spending in Anchorage	21	47,461	131,151	37	6,070	16,868	14	3,220	5,787
Average spending in Kenai area	21	12,829	41,055	37	21,400	34,955	14	34	127
Average spending in Juneau area	21	18	44	37	92	287	13	63	149
Average Spending in other AK	21	5,510	18,878	37	481	2,387	13	14,541	16,952
Average Spending outside AK	21	17,840	76,699	37	5,256	16,310	13	4,598	13,122



## Chapter 8

### ANALYTICAL METHODS AND RESULTS

#### Resident Anglers

The procedures used to analyze Alaska residents' demand for sport fishing in southcentral Alaska and to estimate nonmarket values (i.e. consumer's surplus or net willingness to pay) associated with these activities are described in the following section. The analysis examined summer and winter sport fishing at selected sites in southcentral Alaska. The net value of sport fishing for king salmon on the Kenai River also was analyzed based on responses to a contingent valuation survey. Because of a descriptive error in the survey, the results of the contingent valuation analysis are presented in the supplemental problems report.

#### Summer Sport Fishing

Modeling Approach. The demand for sport fishing by Alaska residents was analyzed using weekly data on the sport fishing activities of 1,063 respondents over the 22 weeks from May 1, 1986 to September 30, 1986. The use of weekly data represents a major innovation in the analysis of recreation demand. Previous studies cited in the literature employ data on sport fishing trips aggregated over the recreation season.

The temporal disaggregation is believed to be crucial to the success of the present study because fishing opportunities in Alaska change dramatically over the season, as evidenced by salmon runs and the opening and closing of fishing sites for particular species. Moreover, for species which are available throughout the season (e.g., trout) the quality of fishing at specific sites can vary substantially over the season. By estimating a weekly model of fishing behavior, we are able to capture this variation in fishing conditions, and to obtain a more accurate assessment of its impacts on Alaska anglers and their valuation of alternative fishing sites.

Given the weekly time dimension, the economic decision model underlying angler behavior is exhibited in Figure 8-1. The angler is first assumed to decide whether to go fishing at all during the week (participation) and, if so, to then choose how many times to go sport fishing (intensity of participation)--once, twice, or more than twice. Given that the individual is making a fishing trip, he is assumed to first select a target species (see Table 8-1 for a list of species groups)--or no target species--and then a site at which to fish for the given target species. (The original list of sites from which the respondent had to choose is shown in Table 8-2; the final list



FIGURE 8-1. DECISION TREE FOR ANALYZING RESIDENT ANGLER'S DEMAND FOR SPORT FISHING

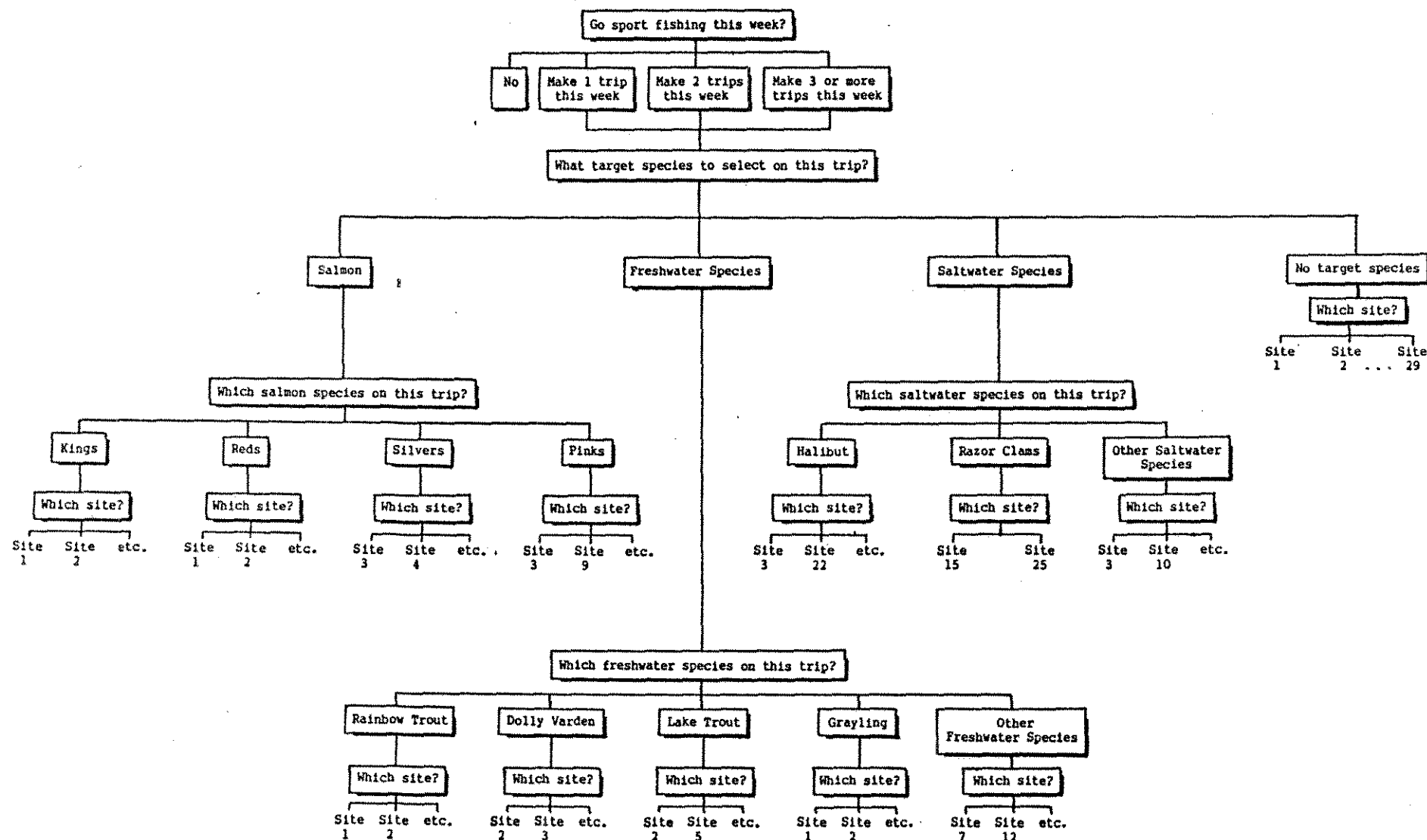


Table 8-1. Species Groups (and Abbreviations) Used for  
the Analysis of Sport Fishing Demand

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Group 1	- king salmon (KS), including small king salmon (KI)
Group 2	- red salmon (RS)
Group 3	- silver salmon (SS)
Group 4	- pink salmon (PS)
Group 5	- rainbow trout (RT) and land-locked salmon (LL)
Group 6	- Dolly Varden (DV) and Arctic char (AC)
Group 7	- lake trout (LT)
Group 8	- Arctic grayling (GR)
Group 9	- other freshwater species -- chum salmon (CS), steel-head trout (SH), cutthroat trout (CT), brook trout (BT), northern pike (NP), sheefish (SF), whitefish-freshwater (WFF), burbot (BB)
Group 10	- halibut (HA)
Group 11	- razor clams (RC)
Group 12	- other saltwater species -- rockfish/seabass (RF/SB), smelt/hooligan/capelin (SM), other finfish (OF), whitefish-saltwater (WFS), other shellfish (OS)
Group 13	- no target (NT)

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Table 8-2. Alaska Sport Fishing Areas and Sites

Site Code	Name of Area/Site	Site Code	Name of Area/Site
<u>SOUTHCENTRAL ALASKA</u>			
<u>Glennallen Area</u>		<u>Kenai Peninsula Area (Contd.)</u>	
I-1	Gulkana River (Paxson-Sourdough)	P-4	Kenai River (Skilak Inlet to Kenai Lake)
I-2	Gulkana River (Sourdough-Highway)	P-5	Skilak Lake
I-3	Gulkana River (Other)	P-6	Kenai Lake
I-4	Tyone, Susitna, Louise Lakes	P-7	Russian River
I-5	Other freshwater sites	P-8	Kasilof River
		P-9	Ninilchik River
		P-10	Anchor River
	<u>Prince William Sound</u>	P-11	Deep Creek (freshwater)
J-1	Valdez Bay	P-12	Other freshwater sites
J-2	Passage Canal (Whittier)	P-13	Deep Creek (saltwater)
J-3	Other saltwater sites	P-14	Kachemak Bay (Homer)
J-4	Freshwater sites	P-15	Resurrection Bay (Seward)
		P-16	Shoreline (Kasilof to Anchor Point:Razor Clams)
	<u>Knik Arm Drainage Area</u>		Other shoreline sites
K-1	Little Susitna River	P-17	Other saltwater sites
K-2	Knik River	P-18	
K-3	Wasilla and Cottonwood Creeks		<u>SOUTHWESTERN ALASKA</u>
K-4	Big Lake		<u>Kodiak Area</u>
K-5	Kepler Complex		Freshwater sites
K-6	Finger Lake	Q-1	Saltwater sites
K-7	Wasilla Lake	Q-2	
K-8	Other freshwater sites		<u>Naknek Area</u>
K-9	Saltwater sites		Naknek River
	<u>Anchorage Area</u>	R-1	Other freshwater sites
L-1	Anchorage Area Lakes	R-2	Saltwater sites
L-2	Bird Creek	R-3	
L-3	Campbell Creek		<u>Kvichak River Drainage Area</u>
L-4	Twentymile River	S-1	Lake Iliamna and tributaries
L-5	Other freshwater sites	S-2	Other freshwater sites
L-6	Saltwater sites		
	<u>East Side Susitna Drainage Area</u>		<u>Nushagak Area</u>
M-1	Clear Creek	T-1	Wood River/Tikchik System
M-2	Montana Creek	T-2	Other freshwater sites
M-3	Caswell Creek	T-3	Saltwater sites
M-4	Willow Creek/Little Willow Creek		
M-5	Other freshwater sites		<u>SOUTHEASTERN ALASKA</u>
	<u>West Side Cook Inlet/West Side Susitna Drainage Area</u>	A	Ketchikan Area
N-1	Deshka River-Kroto Creek	B	Prince of Wales Area
N-2	Lake Creek	C	Kake/Petersburg/Wrangell/Stikine Area
N-3	Alexander Creek	D	Sitka Area
N-4	Talachulitna River		
N-5	Chuitna River		<u>Juneau Area</u>
N-6	Theodore, Lewis, and Ivan Rivers	E-1	Saltwater sites
N-7	Other freshwater sites	E-2	Freshwater sites
N-8	Saltwater sites	F	Haines-Skagway Area
		G	Glacier Bay Area
		H	Yakutat Area
	<u>Kenai Peninsula Area</u>		<u>OTHER ALASKA</u>
P-1	Kenai River (Cook Inlet to Soldotna Bridge)	U	Fairbanks Area
P-2	Kenai River (Soldotna Bridge to Moose River)	V	Lower Yukon/Kuskokwim Area
P-3	Kenai River (Moose River to Skilak Outlet)	W	Seward Peninsula/Norton Sound Area
		X	Northwest Alaska Area
		Y	South Slope Brooks Range Area
		Z	North Slope Brooks Range Area

Table 8-3. Sport Fishing Sites Used for the Analysis  
of Resident's Sport Fishing Demand

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Site 1	-	Gulkana River (I-1, I-2, I-3)
Site 2	-	Other freshwater-area I (I-4, I-5)
Site 3	-	Prince William Sound (all sites, J-1 through J-4)
Site 4	-	Little Susitna River (K-1)
Site 5	-	Big Lake (K-4)
Site 6	-	Kepler Complex (K-5)
Site 7	-	Other area K (K-2, K-3, K-6, K-7, K-8, K-9)
Site 8	-	Anchorage area lakes (L-1)
Site 9	-	Other freshwater-area L (L-2, L-3, L-5)
Site 10	-	Twenty Mile River (L-4), saltwater sites (L-6)
Site 11	-	East Side Susitna roadside streams in part (Montana Creek M-2, Caswell Creek M-3, Willow and Little Willow Creeks M-4)
Site 12	-	Other freshwater-area M (M-1, M-5)
Site 13	-	Lake Creek (N-2)
Site 14	-	West Side Cook Inlet/West Side Susitna streams -- in part (Deshka River/Kroto Creek N-1, Alexander Creek N-3, Talachulitna River N-4, Chuitna River N-5, Theodore, Lewis, and Ivan Rivers N-6)
Site 15	-	Other area N (N-7, N-8)
Site 16	-	Kenai River (P-1)
Site 17	-	Kenai River (P-2, P-3, and P-4)
Site 18	-	Russian River (P-7)
Site 19	-	Kasilof River (P-8)
Site 20	-	Lower Kenai Peninsula streams (Ninilchik River P-9, Anchor River P-10, Deep Creek P-11)
Site 21	-	Other freshwater-area P (P-5, P-6, P-12)
Site 22	-	Deep Creek marine (P-13)
Site 23	-	Kachemak Bay (P-14)
Site 24	-	Resurrection Bay (P-15), other saltwater (P-18)
Site 25	-	Shoreline Kenai Peninsula (P-16, P-17)
Site 26	-	Southwest Alaska (Q, R, S, T,)
Site 27	-	Southeast Alaska (A, B, C, D, E, F, G, H)
Site 28	-	Fairbanks area (U)
Site 29	-	Other Alaska (V, W, X, Y, Z)

---

of sites used for the analysis is shown in Table 8-3. (It should be noted that insufficient data precluded the analysis of sport fishing demand at the three contract sites--Campbell Creek - rainbow trout, Talachulitna River - rainbow trout, and Lower Kenai Peninsula streams - steelhead.)

The set of sites available for species selection varies by species. The sites corresponding to each species are shown in Table 8-4. (It should be noted that not all of these sites are necessarily open for fishing for a particular species in every week of the season. The species choice actually involves two steps. The angler first chooses a "macro" species--salmon, freshwater, saltwater, or no target species--and then he selects a particular sub-species (king salmon versus red salmon, etc.) prior to choosing a specific site.

Within this structure the elemental items (the choices at the very bottom of the tree) are: 1) not fishing in a particular week, or 2) fishing for a particular species--(or for no target species)--at a particular site that week. To explain the relation between these elemental choices and choices "higher up" in the tree, the following notation and subscripts are introduced:

$t=1,\dots,22$  is the subscript for a particular week in the 1986 season.

$s=1,\dots,4$  is the subscript for a particular macrospecies (salmon, freshwater, saltwater, or no target).

$r=1,\dots,R_s$  is the subscript for a subspecies within a particular macro species.

$i=1,\dots,N_{ts}$  is the subscript for a particular site at which fishing for a particular subspecies is available during week  $t$ .

Thus, an elemental probability is:

$\pi_{irst}$  = The probability that an Alaska resident angler makes a fishing trip in week  $t$  for subspecies  $r$  of macrospecies  $s$  at site  $i$ .

Define

$\pi_{rst}$  = The probability that an Alaska resident angler makes a fishing trip in week  $t$  for subspecies  $r$  of macrospecies  $s$ .

$\pi_{i|rst}$  = The probability that an Alaska resident angler selects site  $i$  given that he makes a fishing trip for subspecies  $r$  of macrospecies  $s$  in week  $t$ .

It follows that:

$$\pi_{irst} = \pi_{i|rst} \cdot \pi_{rst} \quad (1)$$

Table 8-4. Species/Site Combinations Used for the Analysis of Resident's Sport Fishing Demand

Site No./Name <sup>1</sup>	Species Groups <sup>2</sup>												
	KS, KI	RS	SS	PS	RT, LL	DV, AC	LT	GR	Other FW	HA	RC	Other SW	NT
1. Gulkana River	X	X			X			X					X
2. Other FW-area I	X	X			X	X	X	X					X
3. Prince William Sound	X	X	X	X	X	X				X		X	X
4. Little Susitna	X	X	X		X	X		X					X
5. Big Lake					X	X	X						X
6. Kepler Complex					X								X
7. Other FW-area K		X	X		X	X	X	X	X				X
8. Anchorage area lakes					X								X
9. Other FW-area L			X	X	X	X	X						X
10. Twentymile River/SW			X									X	X
11. E. Side Cook/Susitna	X	X	X	X	X	X		X					X
12. Other FW-area M	X	X	X	X	X	X		X	X				X
13. Lake Creek	X		X		X				X				X
14. W. Side Cook/Susitna	X	X	X		X								X
15. Other area N	X	X	X		X	X	X	X	X		X		X
16. Kenai River (lower)	X	X	X	X									X
17. Kenai River (other)	X	X	X	X	X	X							X
18. Russian River		X	X			X							X
19. Kasilof River	X	X	X			X							X
20. Lower Kenai Streams	X		X			X			X				X
21. Other FW-area P		X	X	X	X	X	X	X	X	X			X
22. Deep Creek Marine	X		X							X			X
23. Kachemak Bay	X	X	X	X		X				X		X	X
24. Resurrection Bay/SW	X		X	X						X		X	X
25. Shoreline Kenai	X		X							X	X	X	X
26. SW Alaska	X	X	X	X	X	X		X		X			X
27. SE Alaska	X		X						X			X	X
28. Fairbanks	X		X		X		X	X	X				X
29. Other Alaska	X	X	X	X	X	X	X	X	X			X	X

<sup>1</sup> Refer to Table 8-3 for complete listing of sites.

<sup>2</sup> Refer to Table 8-1 for complete listing of species.

Similarly, define:

$\pi_{st}$  = The probability that an Alaska resident angler makes a fishing trip in week  $t$  for macrospecies  $s$ .

$\pi_{r|st}$  = The probability that an Alaska resident angler selects subspecies  $r$  given that he makes a fishing trip for macrospecies  $s$  in week  $t$ .

Then,

$$\pi_{rst} = \pi_{r|st} \cdot \pi_{st} \quad (2)$$

Next, define:

$\pi_{s|t}$  = The probability that an Alaska resident angler selects macrospecies  $s$  given that he makes a fishing trip in week  $t$ .

$\pi_{1t}$  = The probability that an Alaska resident angler makes one fishing trip during week  $t$ .

$\pi_{2t}$  = The probability that an Alaska resident angler makes two fishing trips during week  $t$ .

$\pi_{3t}$  = The probability that an Alaska resident angler makes three or more fishing trips during week  $t$ .

$\pi_{Ft}$  = The probability that an Alaska resident angler makes at least one fishing trip during week  $t$ .

$\pi_{Nt}$  = The probability that an Alaska resident angler does not make any fishing trips during week  $t$ .

It follows that:

$$\pi_{Ft} = \pi_{1t} + \pi_{2t} + \pi_{3t} \quad (3)$$

$$\pi_{st} = \pi_{s|t} \cdot \pi_{Ft} \quad (4)$$

By combining (1)-(4), the elemental probabilities can be expressed as the following product of conditional probabilities:

$$\pi_{irst} = \pi_{i|rst} \cdot \pi_{r|st} \cdot \pi_{s|t} \cdot \pi_{Ft} \quad (5)$$

This decomposition is exploited in the estimation of the statistical model. Instead of estimating the elemental probabilities directly, we sequentially estimate each of the conditional probabilities on the right-hand side of (5). Thus, we start by estimating the conditional site selection probabilities ( $\pi_{i|rst}$ ) for each of the 12 distinct fish subspecies plus for "no target" species. Next, we estimate the conditional species

selection probabilities ( $\pi_{r|s}^t$ ,  $\pi_{s|t}^r$ ). Finally, we estimate the participation and intensity of participation probabilities ( $\pi_{Nt}^r$ ,  $\pi_{1t}^r$ ,  $\pi_{2t}^r$ ,  $\pi_{3t}^r$ ). These results are presented below; technical details of the statistical models are given in Appendix C.

Site Selection. The following explanatory variables were used in the analysis of the conditional site selection probabilities:

TRAVEL COST<sub>i</sub>:

Round trip travel cost from origin zones (Table 8-5) to site  $i$  for road-access sites. This cost is computed as round trip distance multiplied by the individual respondent's motor vehicle cost per mile. For sites 13-15 (Lake Creek, Westside Susitna streams and others), 26 and 27 (southwest and southeast Alaska) and 29 (other Alaska) this cost is computed on the basis of estimated round-trip flying cost from the origin zone to the site. Round trip train costs were added for trips involving passage between Portage and Whittier. For certain sites and species combinations in which fishing from a boat is very common (all sport fishing at Deep Creek Marine, Kachemak Bay, and Resurrection Bay; salmon fishing in Prince William Sound; and sport fishing for halibut and other saltwater species at Prince William Sound, Kenai Peninsula shoreline, and southwest, southeast and other Alaska), a boating cost is added to the round-trip travel cost.

SITE RATING<sub>it</sub>:

A species-specific index of the quality of fishing at site  $i$  in week  $t$ . This index initially ranged from 1 (very poor) to 8 (excellent). The rating was then normalized to account for weekly variation by dividing the weekly rating by the mean rating for the site over the season. The rating for other saltwater species (group 12) was not normalized because a catch variable was not used for this species group.

SALMON RATING<sub>it</sub>:  
FRESHWATER RATING<sub>i</sub>:  
SALTWATER RATING<sub>i</sub>:

A general index of the quality of fishing for each macrospecies at site  $i$  (and in week  $t$  for salmon) used in the site selection model for trips with no target species. The index rating ranges from 0 (not available), to 4 (excellent).

DEVELOPED<sub>i</sub>:

A dummy variable taking the value 1 if site  $i$  is developed with boat and tourist facilities, and 0 otherwise.



Table 8-5. Origin Zones Used for the Analysis of  
Resident's Sport Fishing Demand

Origin Zone Number	Corresponding Area
1	Homer, Seldovia
2	Anchor Point, Ninilchik
3	Clam Gulch, Kasilof
4	Kenai, Nikiska
5	Soldotna, Sterling, Cooper Landing
6	Seward, Moose Pass
7	SW Anchorage area
8	SE Anchorage area
9	NW Anchorage area
10	NE Anchorage area, Eagle River
11	Palmer, Sutton
12	Wasilla
13	Big Lake, Willow, Trapper Creek
14	Talkeetna
15	Glennallen
16	Fairbanks

CROWD<sub>f</sub><sub>it</sub>:

A measure of crowding conditions at site *i* in week *t* as they affect individual respondents. Computed as the product of the individual respondent's crowding tolerance index (positive if the individual likes crowded conditions, negative if he dislikes them), and a measure of crowding conditions at the site that week (0 = not crowded, 1 = somewhat crowded, 2 = very crowded). CROWD *f* is 0 if either the site is not crowded, or the individual is indifferent to crowding; it is large and negative if the site is crowded and the individual strongly dislikes crowding; it is large and positive if the site is crowded and the individual prefers crowded sites.

CABIN<sub>i</sub>:

A dummy variable taking the value 1 if the individual respondent owns or has regular access to a private cabin at site *i*, and 0 otherwise.

1985 HARV<sub>i</sub>:

This variable measures the total number of species caught (in thousands) at different sites in 1985.

As explained in Appendix C, the overall decision tree in Figure 8-1 is modeled as a Generalized Logit model. This structure generates a simple logit model for the site selection probabilities on any trip for the given species in the given week:

$$\pi_{i|rst} = e^{w_{irst}} \cdot \left[ \sum_{i'=1}^{N_{rs}} e^{w_{jrst} - 1} \right] \quad i = 1, \dots, N_{rs} \quad (6)$$

One of these models is used for each subspecies *r* of every macrospecies *s*--i.e., there are 13 such models (including the model for no target species trips). The terms  $w_{irst}$  in (6) represent a linear combination of variables and coefficients, and can be thought of as indices of the desirability of fishing at site *i*, given that one is making a trip for subspecies *r* of macrospecies *s* in week *t*. These terms are linear functions of the variables listed above; multiplied by coefficients which are estimated from the data. The particular variables used and the estimated coefficients differ from species to species, and the

results are presented in Table 8-6. In the case of king salmon fishing trips, for example:

$$W_{irst} = -0.9468 \ln (\text{TRAVEL COST}_i) + 0.9589 \text{ SITE RATING}_{it} + 0.5376 \ln (1985 \text{ HARV}_i) + 2.1272 \text{ CABIN}_i + 0.1764 \text{ CROWD}_{it} \quad (7)$$

Thus, a site is more attractive to king salmon anglers if (1) the site has good quality fishing that week, (2) the site had a large catch in 1985, (3) the individual owns or has access to a cabin nearby, (4) the site is less crowded that week, or (5) the site is less expensive for the individual to reach.

The other sets of coefficients in Table 8-6 are used to form the  $w_{irst}$  indices for the other species in the same manner as (7). All coefficients have the same signs as in the king salmon site selection model (7). In addition, DEVELOPED, which is not a variable in (7), has a significant positive coefficient for no target species. In this case, anglers appear to favor developed sites over nondeveloped sites.

The model for razor clams has a particularly simple structure because there are only two sites - Kenai Peninsula shoreline (site 25) and other Westside Susitna (site 15) - in the choice set. In this case,

$$W_{irst} = \begin{matrix} 2.2769 - 0.3512 \ln (\text{TRAVELCOST}_i) & \text{for site 25} \\ -0.3512 \ln (\text{TRAVELCOST}_i) & \text{for site 15} \end{matrix} \quad (8)$$

Species Selection. Using the Generalized Logit formulation, the subspecies selection probabilities take the form:

$$\pi_{r|st} = \frac{e^{W_{rst}}}{\sum_{r=1}^R e^{W_{rst}}} \quad r=1, \dots, R_s$$

where

$$W_{rst} = \alpha_r + \delta_r I_{rst} \quad (9)$$

and the  $\alpha_r$ 's and  $\delta_r$ 's are coefficients to be estimated while  $I_{rst}$  is a variable known as the "inclusive value." This value is constructed from the coefficient of the site selection model according to the formula

$$I_{rst} = \ln \left( \sum_{i=1}^{N_{rs}} e^{W_{jrst}} \right) \quad (10)$$

Table 8-6. Logit Results of Site Selection, by Species

Variables	Parameter Estimates, by Species												
	King Salmon	Red Salmon	Silver Salmon	Pink Salmon	Rainbow Trout and Land-Locked Salmon	Dolly Varden and Arctic Char	Lake Trout	Arctic Grayling	Other Freshwater	Halibut	Razor Clams	Other Saltwater	No Target
Log (TRAVEL COST)	-0.9468 (-30.42)*	-0.4163 (-7.35)	-0.5733 (-19.51)	-0.8984 (-7.97)	-0.5971 (-20.31)	-0.6298 (-8.42)	-0.4905 (-2.58)	-0.3438 (-4.56)	-0.7912 (-9.68)	-0.0069 <sup>1</sup> (-11.72)	-0.3512 (-0.56)	-0.7790 (-6.20)	-0.0040 <sup>1</sup> (11.75)
SITE RATING	0.9589 (12.40)	1.5668 (9.37)	0.9554 (9.37)	1.7324 (7.15)	0.9960 (8.03)	1.0812 (4.08)	17.4337 (7.18)	4.4090 (10.41)	2.0837 (3.52)	2.3009 (7.25)	--	0.4748 (6.80)	--
DEVELOPED	--	--	--	--	--	--	--	--	--	--	--	--	0.2486 (3.30)
CROWD F	0.1764 (4.32)	0.2414 (3.93)	0.3862 (6.44)	--	0.2405 (4.27)	--	3.8693 (4.90)	--	--	--	--	--	--
CABIN	2.1272 (15.61)	2.0323 (8.79)	2.1929 (14.64)	0.8719 (1.66)	2.5098 (15.46)	1.9802 (5.45)	6.0714 <sup>2</sup> (6.49)	1.7778 (7.05)	2.8666 (4.06)	1.3378 (3.79)	--	3.5441 (2.81)	2.6408 (21.06)
LOG (1985 HARV)	0.5376 (18.23)	0.0299 <sup>2</sup> (17.36)	0.4257 (13.34)	0.2423 (2.74)	0.3451 (10.71)	0.3316 (4.39)	0.5825 (7.07)	1.4836 (19.54)	0.5304 (7.49)	1.0306 (14.70)	--	--	--
SALMON RATING	--	--	--	--	--	--	--	--	--	--	--	--	0.1792 (6.18)
FRESHWATER RATING	--	--	--	--	--	--	--	--	--	--	--	--	0.5266 (13.41)
SALTWATER RATING	--	--	--	--	--	--	--	--	--	--	--	--	0.2832 (8.25)
Site 25 (dummy)	--	--	--	--	--	--	--	--	--	--	2.2769 (1.98)	--	--
Restricted log likelihood	-3776	-1301	-2754	-268	-2488	-426	-295	-1088	-336	-1279	-40	-171	-4061
Maximum log likelihood	-2706	-1018	-2161	-201	-1875	-345	-59	-390	-166	-674	-12	-118	-3296
Chi-square statistic	2140	246	11.68	134	1226	162	472	1396	340	1210	56	106	1530
Degrees of freedom	5	5	5	4	5	4	5	4	4	4	2	3	6

\* T-statistic

<sup>1</sup> Actual travel cost used, instead of log of travel cost.<sup>2</sup> Actual 1985 harvest used, instead of log of 1985 harvest.

Recall that  $W_{irst}$  is an index of the desirability of site  $i$  where one is making a trip for subspecies  $r$  of macrospecies  $s$  in week  $t$ . It follows, therefore, that  $I_{rst}$  is an index of the overall quality of fishing opportunities for subspecies  $r$  of macrospecies  $s$  in week  $t$ , averaged over all the sites at which the species is available in that week. The term  $W_{rst}$  in (9) can be interpreted as an index of the desirability of subspecies  $r$  in week  $t$  relative to the other subspecies within a given macrospecies  $s$ . This is modeled here as a function of an intercept ( $\alpha_r$ ), as well as the inclusive value. (Using the inclusive value to link the factors entering a lower level decision, site selection, to the determination of a higher level decision, subspecies selection, is a distinctive feature of the Generalized Logit model.)

The coefficients  $\alpha_r$  and  $\delta_r$  can be interpreted as preference weights. Since the inclusive values vary weekly and capture weekly variations in the quality of fishing conditions for each subspecies, the coefficient  $\delta_r$  (which should be positive) can be thought of as a weight placed on the effects of fishing for subspecies  $r$ , which vary over the course of the season. By contrast, the intercept  $\alpha_r$  captures that part of the individual preference for the subspecies which is not keyed to factors that vary over the season. The logic of the logit model requires that one of the intercepts be normalized to zero, and that the others are measured relative to it (and thus can be positive or negative). If  $\alpha_r$  is large in absolute value and  $\delta_r$  is close to zero, the probability of selecting subspecies  $r$  will not be much affected by weekly variations in fishing conditions for the species (although the site selection probabilities may still be very sensitive to such variation); an example is halibut within the saltwater macrospecies. Conversely, if  $\alpha_r$  is close to zero and  $\delta_r$  is large, the subspecies selection probabilities are highly responsive to weekly fluctuations in conditions.

Maximum likelihood estimates of the coefficients ( $\alpha_r$ ,  $\delta_r$ ) for each of the subspecies in macrospecies ( $s$  = salmon, freshwater, and saltwater) are presented in Table 8-7. All of the coefficients on the inclusive values have the correct sign; all inclusive value coefficients are significant at standard levels, except for the coefficient on halibut which is marginally significant and on other saltwater species which is close to zero. The fact that the inclusive value coefficient is close to zero probably reflects the consequence of the heterogeneity of the different types of fish included within this category.

The four macrospecies are salmon, freshwater and saltwater ( $s=1,2,3$ ) and no target species ( $s=4$ ). The macrospecies selection probabilities take the form:

Table 8-7. Parameter Estimates for Subspecies Selection Model.

Subspecies	Parameters	
	Constant ( $\alpha_r$ )	Inclusive Value ( $\delta_r$ )
<b>SALMON MACROSPECIES</b>		
Kings	1.2485* (10.70)	1.1440 (19.35)
Reds	-3.0194 (-10.03)	1.2810 (16.22)
Silvers	-1.3247 (-6.79)	1.3597 (20.41)
Pinks	0 (normalized)	0.4493 (7.38)
Restricted log-likelihood:	-3728	
Maximized log-likelihood:	-2066	
Chi-square statistic:	1662	
<b>FRESHWATER MACROSPECIES</b>		
Rainbow Trout	-1.0146 (-3.86)	1.2261 (13.93)
Dolly Varden	-2.4593 (-6.46)	1.5304 (9.78)
Lake Trout	-2.4267 (-4.63)	0.1330 (6.65)
Grayling	-11.3518 (-13.69)	1.2910 (15.76)
Other Freshwater	0 normalized	0.5595 (8.29)
Restricted log-likelihood:	-3045	
Maximized log-likelihood:	-2373	
Chi-square statistic:	1344	
<b>SALTWATER MACROSPECIES</b>		
Other Saltwater	1.5753 (2.68)	0.0279 (0.18)
Halibut	1.9708 (1.67)	0.2406 (1.38)
Razor Clams	0 (normalized)	0.9755 (2.04)
Restricted log-likelihood:	-907	
Maximized log-likelihood:	-498	
Chi-square statistic:	818	
* T-statistic		

$$\pi_{s|t} = \frac{e^{W_{st}}}{\sum_{s=1}^4 e^{W_{st}}} \quad s=1, \dots, 4 \quad (11)$$

The terms  $W_{st}$  are indices of the relative attractiveness of each species (or of not having a target species) to an angler taking a fishing trip in week  $t$ . As we modeled them, they are functions of the following variables:

- D INCOME: Discretionary income per choice occasion in thousands of dollars. For each of 7 income groups, annual discretionary income was first computed as a proportion of pretax household income using U. S. Department of Labor (1986) statistics for Alaska. Categories of discretionary income included: food away from home (50 percent), alcoholic beverages, automobile expenses (50 percent), entertainment, reading materials and cash contributions. Summer discretionary income was computed by multiplying the annual amount by .42 (the percentage of summer weeks). Summer discretionary income was then divided by the number of sport fishing trips (choice occasions) which the individual took over the summer.
- SITE FOCUS: A dummy variable taking the value 1 if the individual indicated that the choice of a site was more important to him than the choice of a target species, and 0 otherwise.
- BOATOWN: A dummy variable taking the value 1 if the individual owns a boat, and 0 otherwise.
- TROPHY: A dummy variable taking the value 1 if the individual prefers trophy sport fishing, and 0 otherwise.
- RELEASE: A dummy variable taking the value 1 if the individual prefers catch and release sport fishing, and 0 otherwise.

I<sub>st</sub>:

An inclusive value index measuring the overall quality of sport fishing opportunities for macrospecies *s* in week *t*. For *s* = 1,2,3 this value is calculated according to the following formula:

$$I_{st} = \ln \left( \sum_{r'=1}^R e^{W_{r'st}} \right) \quad (12)$$

while *I<sub>4t</sub>* is given by the right-hand side of (10) computed for *s*=4.

The general formula for these terms is:

$$W_{st} = \gamma_s + \eta_s \text{ DINCOME} + \beta_{1s} \text{ SITE FOCUS} + \beta_{2s} \left\{ \begin{array}{l} \text{BOATOWN} \\ \text{TROPHY} \\ \text{RELEASE} \end{array} \right\} + \theta_s I_{st} \quad (13)$$

and  $\gamma_s$ ,  $\eta_s$ , and  $\beta_s$  are coefficients to be estimated. As with the subspecies model, the coefficient of inclusive value ( $\theta_s$ ) serves as the weight placed on the aspects of fishing for macro-species  $\theta_s$ , which vary during the course of the season; the term ( $\gamma_s + \eta_s \text{ DINCOME} + \beta_{1s} \text{ SITE FOCUS} + \beta_{2s} \text{ BOATOWN/TROPHY/RELEASE}$ ) captures that part of the individual's preference for the macro-species that is not keyed to factors that vary over the season.

Maximum likelihood estimates of the coefficients  $\gamma_s$ ,  $\eta_s$ ,  $\beta_{1s}$ ,  $\beta_{2s}$ ,  $\theta_s$  for *s*=1, ..., 4 are presented in Table 8-8. One of the intercept and income coefficients must be normalized to zero, and the others are measured relative to them. In this case we normalized on no target species and we took the negative of its price (travel cost) coefficient in Table 8-6 as the marginal utility of income for no target trips. This term was then added to  $\eta_s$  (*s*=1,2,3) to obtain the estimated marginal utility of income for specific macrospecies fishing trips. The largest income coefficients in Table 8-8 are for saltwater and salmon, indicating that these species have the highest income elasticities of demand. The income coefficient for freshwater species is negative but not significant, indicating that it has a lower income elasticity than no target species. The SITE FOCUS coefficients indicate that, for freshwater trips, the site is a more important factor than the particular subspecies; the reverse is true for salmon and saltwater trips.

Fishing Participation. As depicted at the top of the tree in Figure 8-1, the angler decides whether to go fishing during week *t* and, if so, how many trips to make--one, two, or more than two. The logic of the Generalized Logit model is that this



Table 8-8. Parameter Estimates for Macrospecies Selection Model

Macrospecies	Parameters						
	Intercept ( $\gamma_s$ )	DINCOME ( $\eta_s$ )	Inclusive Value ( $\theta_s$ )	SITE FOCUS ( $\gamma_{1s}$ )	BOATOWN ( $\beta_{2s}$ )	TROPHY ( $\beta_{2s}$ )	RELEASE ( $\beta_{2s}$ )
Salmon	0.9556 (4.91)*	3.8803 (3.97)	0.8260 (25.86)	-0.3459 (-4.21)	-- --	0.3765 (5.37)	-- --
Freshwater	-0.4568 (-2.13)	(-0.4907) (-0.46)	0.9728 (18.60)	0.1815 (2.18)	-- --	-- --	0.6050 (9.82)
Saltwater	-14.2746 (-13.32)	6.9863 (6.34)	4.2851 (14.78)	-0.3861 (-3.49)	0.4563 (5.94)	-- --	-- --
No Target	0 (normalized)	0 (normalized)	0.8583 (12.82)	0 (normalized)	-- --	-- --	-- --
Restricted log-likelihood: -9448							
Maximized log-likelihood: -8007							
Chi-square statistic: 2882							
*t-statistic							

choice is a function of the inclusive value computed from the macrospecies selection model,

$$I_{Ft} = \ln(\sum_{s'=1}^4 e^{W_{s't}}) \quad (14)$$

which measures the overall quality of sport fishing in Alaska in week  $t$  as weighted by individual angler preferences. Other variables used in the analysis of fishing frequency are:

JUL4HOL <sub>$t$</sub> : A dummy variable which takes the value 1 if the week contains the July 4 holiday, and 0 otherwise.

LOTEMP <sub>$t$</sub> : A dummy variable which takes the value 1 when the weekly low temperature in Anchorage is below 40°F, and 0 otherwise.

LEISURE: An index of the amount of leisure time available to the individual angler, based on a factor analysis of response to question 5 in section I of QI and the combination questionnaire.

OWN: A dummy variable which takes the value 1 if the individual owns a cabin, boat, or RV, and 0 otherwise.

SKILL: An index of the individual's experience in sport fishing, based on the response to question 7 in section I of QI and the combination questionnaire. This index ranges from 1 (a novice) to 4 (an expert angler).

AVLONG: The average length (in days) of all fishing trips taken by the individual in Alaska over the 1986 summer season.

The formulas for the fishing participation probabilities are:

$$\pi_{it} = \frac{e^{W_{it}}}{e^{W_{Nt}} + e^{W_{1t}} + e^{W_{2t}} + e^{W_{3t}}} \quad i = 1, 2, 3 \quad (15a)$$

which is the probability that the angler makes one ( $i=1$ ), two ( $i=2$ ), or more than two ( $i=3$ ) fishing trips during the week and

$$\pi_{Nt} = \frac{e^{W_{Nt}}}{e^{W_{Nt}} + e^{W_{1t}} + e^{W_{2t}} + e^{W_{3t}}} \quad (15b)$$

is the probability that he does not make any fishing trips during that week. The mean number of trips taken by those with more than two trips was 3.63; the majority (63%) of cases with more than two trips during a week involved three trips. The expected number of trips by an angler during week  $t$  ( $X_t$ ) can be estimated as

$$X_t = \pi_{1t} + 2\pi_{2t} + 3.63\pi_{3t}$$

The terms  $W_{Nt}$  and  $W_{Tt}$ ,  $T = 1, 2, 3$  in (15a, b) are indices of the relative attractiveness to an angler of not taking a fishing trip in week  $t$ , or of taking one, two, or more than two trips. The term  $W_{Nt}$ , the angler's "baseline" utility associated with not fishing, is normalized to zero:

$$W_{Nt} = 0$$

The other  $W_{Tt}$  terms are expressed as functions of an intercept and the explanatory variables listed above:

$$\begin{aligned} W_{Tt} &= B_{T0} + B_{T1} \text{ LEISURE} + B_{T2} \text{ OWN} + B_{T3} \text{ SKILL} \\ &\quad + B_{T4} \text{ AVLONG} + B_{T5} \text{ JUL4HOL} + B_{T6} \text{ LOTEMP} + B_{T7} I_{ft} \\ &= W_t + B_{T7} I_{FT} \end{aligned} \quad (16)$$

These functions, estimated by maximum likelihood, are presented in Table 8-9. The constant terms are negative (i.e. less than  $W$ ), but when the other terms in the formula are evaluated, the  $W_{it}$ 's may be positive.

The coefficients in Table 8-9 are almost all significant and correspond well to expectations: Anglers who make longer trips also take fewer trips and are less likely to make multiple trips in a week (the coefficients of AVLONG are negative and become uniformly more negative when moving from  $W_{1t}$  to  $W_{3t}$ ). The persons with the most leisure in our sample tend to be retired persons. When compared with the average angler, they are less likely to take one trip but more likely to take two or more trips. Anglers who own a boat, cabin, or RV, or who are more skilled, are more likely to go fishing; they are also likely to take more trips. During the week of the July 4 holiday, all individuals are more likely to take a fishing trip, but the holiday has no impact on whether they take more than one trip. Finally, the quality of fishing opportunities each week,

Table 8-9. Parameter Estimates for Probability of Taking a Fishing Trip

Equation	Intercept	Explanatory Variable						$I_{ft}$	
		LEISURE	OWN	SKILL	AVLONG	JUL4HOL <sub>t</sub>	LOTEMP <sub>t</sub>	Weeks 1-13	Weeks 14-22
$W_{1t}$	-2.9770 (-19.75)	-0.0569 (-3.15)	0.2055 (5.23)	0.3734 (16.66)	-0.0743 (-6.51)	0.4863 (6.86)	-1.2537 (-17.62)	0.2564 (7.57)	0.1467 (4.08)
$W_{2t}$	-4.6245 (-12.57)	0.1473 (3.74)	0.1288 (1.42)	0.6389 (12.10)	-0.8047 (-15.46)	0.3768 (2.47)	-1.6397 (-8.06)	0.3864 (4.81)	0.2478 (2.87)
$W_{3t}$	-5.7348 (-10.94)	0.2607 (5.03)	0.5147 (3.78)	0.8574 (11.43)	-1.9736 (-14.76)	-0.0276 (-0.11)	-1.1510 (-4.61)	0.6565 (6.07)	0.5154 (4.42)

\* T-statistic

Restricted log-likelihood: -29213

Maximized Log-likelihood: -13669

as measured by the inclusive value  $I_{Ft}$ , has very significant positive impacts on the likelihood of taking a fishing trip that week and on the number of trips. There is an interesting time dimension to these impacts. The estimated model allows for separate coefficients on  $I_{Ft}$  for the early season (the first 13 weeks, through July 31) and the later season; the impact of good fishing quality on fishing trips is significantly greater in the early season.

To this point, the analysis has focused on fishing behavior during 1986 by Alaska resident anglers. From the initial post-card survey we also have data on the number of fishing households and its determinants. Of the 3,842 responses to the initial survey, 2,962 (77 percent) indicated that at least one member of the household expected to go fishing in Alaska during 1986. The explanatory variables available from the survey included:

<u>HSNUM</u> :	The number of persons in the household.
<u>FPREV</u> :	A dummy variable taking the value 1 if any members of the household had fished during 1983-1985, and 0 otherwise.
<u>YRALASKA</u> :	The number of years that household members had lived in Alaska (with 0.5 the minimum value).
<u>FAIRBANKS</u> :	A dummy variable taking the value 1 for Fairbanks area households, and 0 otherwise.

The fitted equation is a logit model:

$$\text{Probability of angler household} = \frac{1}{1+e^{-w}}$$

(i.e., a higher value of  $w$  raises the probability a sport fishing household) where

$$w = \begin{matrix} -0.7434 & + & 0.6723 \ln(\text{HSNUM}) & + & 3.0368 \text{FPREV} & - \\ (5.11) & & (7.64) & & (29.66) & \\ & & 0.2664 \ln(\text{YRALASKA}) & - & 0.238 \text{FAIRBANKS} & \\ & & (5.83) & & (2.07) & \end{matrix}$$

Restricted log-likelihood: -5326  
Maximized log-likelihood: -2910

Thus, members of large households and households which had previously sport fished in Alaska were more likely to fish in Alaska in 1986. Newer Alaska residents are somewhat more likely to go fishing than longer established residents, although the

effect is reduced as the length of residence increases. Finally, residents of Fairbanks are slightly less likely to go fishing than other persons in our sample (primarily Anchorage residents).

Net Willingness To Pay. Hanemann (1985) shows how estimates of net willingness to pay (the dollar amount over and above actual expenditures) for sport fishing opportunities can be derived from fitted logit models. In this study, a considerably more complex model--a four-level nested Generalized Logit model--is developed, but a similar methodology applies. The specific formulas, however, become extremely complex and, in some cases, require numerical integrations which are beyond the time and resources presently available for this study, given the large data set. As a result, less complex approximations are employed. In this section the basic approach to estimate net willingness to pay values from logit models is outlined, the formulas summarized, and the empirical results from the resident demand model presented.

In the present application the focus is on valuing the existence of sport fishing opportunities (rather than changes in fishing quality). Measures of net willingness to pay (WTP) rather than willingness to accept (WTA) are estimated. Because WTP is less than WTA, our estimates are conservative.

The basic concept in valuing a particular type of sport fishing--for example, sport fishing for king salmon on the Kenai River--is that every time an individual goes on a fishing trip he benefits from the existence of that particular fishing opportunity. As explained in Appendix C, the Generalized Logit model derives from a random utility maximization model in which individual choices can be described only in probabilistic terms. Consequently, regardless of whether an individual actually chooses the specific fishing alternative on a particular fishing trip, there is some probability that he might select it and, therefore, he derives some benefit from its existence when making his fishing choice.

A direct link exists between the probability of selecting a site and its benefit. It can be shown that the higher the probability of selecting an alternative, the greater the benefit from its existence. The benefit is measured in terms of the maximum amount of money the individual would be willing to pay to ensure that the alternative is available whenever he makes a fishing choice. We therefore obtain an estimate of benefit per choice occasion, i.e., per fishing trip to any site, not just per trip to the particular site of interest. Because our resident angler model is estimated on a weekly basis, the benefit to an individual is the benefit per choice occasion during that week, multiplied by the predicted number of trips (choice occasions) that week. The total benefit for the entire summer recreation season is the sum of the weekly benefits over the season.

Abstracting for a moment from the no-fishing alternative and from the number of fishing trips taken in a week, the elemental alternatives are the choice of subspecies  $r$  of macro-species  $s$  at site  $i$ . From equation (4b) in Appendix C, the component of the individual's utility function associated with this choice is  $V_{irst}$ . Considering all sites and all species, there are about 300 such elemental alternatives in any given week. For convenience, we simplify the subscripts here and rewrite these terms as  $V_1, \dots, V_{300}$ .

Suppose we want to estimate an individual's WTP for the first alternative. Let  $\pi_{1t}(r_1)$  be the probability that the individual selects that alternative in week  $t$ , regarded as a function of  $r_1$ . It can be shown that the individual's expected WTP per choice occasion to ensure the availability of that alternative, denoted  $C_1$ , is given by:

$$C_1 = \frac{1}{\eta_1} \int_{-\infty}^{V_1} \pi_{1t}(v_1') dv_1' \quad (17)$$

where  $\eta$  is the income coefficient associated with the alternative. For a Generalized Logit model, it can be shown that this reduces to

$$C_1 = \frac{1}{\eta_1} \ln \frac{G(e^{V_1}, e^{V_2}, \dots, e^{V_{300}})}{G(0, e^{V_2}, \dots, e^{V_{300}})} \quad (18a)$$

$$= \frac{1}{\eta_1} (I_{Ft} - I'_{Ft}) \quad (18b)$$

where  $I_{Ft}$  is the (baseline) inclusive value index when the alternative is available and  $I'_{Ft}$  is the inclusive value recomputed with that alternative eliminated. That is, the WTP per choice occasion can be shown to be equal to the change in inclusive value divided by the marginal utility of money ( $\eta$ ). In the case of a standard logit model, equations (18a,b) reduce to

$$C_1 = \ln(1 - \pi_{1t}) / \eta_1 \quad (19)$$

which is the formula originally derived in Hanemann (1985).

Complications occur where two or more alternatives are valued simultaneously (e.g., king salmon fishing at several sites, or fishing for several species at a single site or group of sites). To illustrate, suppose we want to value alternatives number 1 and 2. It can be shown that the expected WTP per

choice occasion to ensure the availability of both alternatives, denoted  $C_{12}$ , is given by

$$C_{12} = \frac{1}{\eta_1} \int_{-\infty}^{v_1} \pi_{1t}(v_1') dv_1' + \frac{1}{\eta_2} \int_{-\infty}^{v_2} \pi_{2t}(v_2') dv_2' \quad (20)$$

where  $\eta_2$  is the income coefficient associated with alternative 2 and  $\pi_{2t}(v_2')$  is the probability of selecting that alternative regarded as a function of  $v_2'$ . With a Generalized Logit model, it can be shown that the formula becomes

$$C_{12} = \frac{1}{\eta_1} \int_{-\infty}^{v_1} \frac{G_1(1, e^{v_2-v_1}, e^{v_3-v_1}, \dots, e^{v_{300}-v_1})}{G(1, e^{v_2-v_1}, e^{v_3-v_1}, \dots, e^{v_{300}-v_1})} dv_1' \quad (21)$$

$$+ \frac{1}{\eta_2} \int_{-\infty}^{v_2} \frac{G_2(e^{v_1-v_2}, 1, e^{v_3-v_2}, \dots, e^{v_{300}-v_2})}{G(e^{v_1-v_2}, 1, e^{v_3-v_2}, \dots, e^{v_{300}-v_2})} dv_2'$$

where  $G_1(\cdot)$  and  $G_2(\cdot)$  are the partial derivatives of  $G(\cdot)$  with respect to its first and second arguments. If alternatives 1 and 2 together form a separate branch of the decision tree (Figure 8-1)--for example, these alternatives could comprise a separate subspecies or macrospecies--and  $\eta_1 = \eta_2 = \eta_{12}$ , this formula reduces to

$$C_{12} = \ln(1 - \pi_{12t}) / \eta_{12} \quad (22)$$

where  $\pi_{12t}$  is the probability of selecting that branch. Otherwise the integrals in (21) require numerical integration. This integration can be performed but requires a significant programming effort because of the large data set and the complex nesting structure. It can be shown that

$$C_1 + C_2 \leq C_{12} \quad (23)$$

i.e., the value of alternatives 1 and 2 taken together is larger than the sum of the values of each alternative separately. Because the values of individual alternatives can readily be calculated from (18b) or (19), we computed  $C_1 + C_2$  as a lower bound on the true value  $C_{12}$ . A similar procedure is used to approximate the values of groups of three or more elemental alternatives simultaneously.



To summarize, we obtain estimates of the value of single elemental alternatives from the formula in (18), while we approximate the value of groups of alternatives by summing the values of the individual elements in the group, as in (23). To simplify the computations we use a weighted average of the individual income coefficient as the marginal utility of income in all of the computations. This yields estimates of values per choice occasion in a given week,  $t$ . These are multiplied by the predicted number of choice occasions (fishing trips) in that week to give the total value per week. The value for the season as a whole is the sum of the weekly values. These values are computed for individuals residing in each origin zone and aggregated over all origin zones to give the total value for all Alaska resident anglers. The average per choice occasion and aggregate values for the sites/species combinations identified as study objectives (Table 1-1) are shown in Table 8-10.

### Winter Sport Fishing

The analysis of winter sport fishing was performed using data collected in QI and pooled over the winter season. Of the 1,110 respondents to QI, 270 (24.3 percent) indicated that they had made at least one sport fishing trip between November 1, 1985 and April 30, 1986. Overall, these respondents made 1,508 trips, or about 5.6 trips/winter fishing household. These trips were taken to approximately 180 different sites. Of these sites, seven fishing areas comprising 31 sites accounted for 677 (44 percent) of the fishing trips. These fishing areas and corresponding sites are shown in Table 8-11.

A logit model was used to analyze the demand for sport fishing at the seven fishing areas. The total number of trips used in the analysis was 569. The main explanatory variable used was the travel cost from the individual's home to the fishing area, computed as the product of the individual's trip cost per mile and the mileage from the individual's origin zone to the area. Approximate mileages from the origin zones to each area are shown in Table 8-12. The trip cost per mile varied from individual to individual and was computed from the questionnaire responses. A typical cost to travel to the fishing area was approximately \$0.15/mile.

The logit model fitted to the data was:

$$\pi_i = \text{Pr \{select site } i \text{ for winter fishing\}} = \frac{e^{v_i}}{\sum e^{v_i}} \quad (24)$$

where

$$v_i = \alpha_i - 0.0744 \text{ (round trip travel cost to site } i) \quad (25)$$

(13.49)\*

Table 8-10. Net Willingness-to-Pay (WTP) Estimates for  
Summer Sport Fishing Opportunities

Site/Species <sup>1</sup>	Average Net WTP <sup>2</sup> Per Choice Occasion	Aggregate Net WTP
1. Gulkana River - all species	\$ 2.58	\$ 1,834,000
Gulkana River - grayling	0.49	346,000
4. Little Susitna River - king salmon	1.86	1,323,000
Little Susitna River - silver salmon	0.82	583,000
5. Big Lake - Rainbow trout	1.61	1,141,000
8. Anchorage area lakes - rainbow trout, land-locked salmon	3.00	2,127,000
11. East Susitna roadside streams - king salmon	0.81	576,000
East Susitna roadside streams - silver salmon	1.02	726,000
13. Lake Creek - all species	1.20	852,000
14. West Susitna streams - king salmon	1.66	1,180,000
West Susitna streams - silver salmon	0.65	485,000
16. and 17. Kenai River - all species	21.47	15,241,000
Kenai River - king salmon (early run)	5.69	4,038,000
Kenai River - king salmon (late run)	3.49	2,477,000
Kenai River - silver salmon (early run)	3.58	2,541,000
Kenai River - silver salmon (late run)	2.32	1,645,000
Kenai River - red salmon	2.41	1,711,000
Kenai River - rainbow trout	0.97	688,000
18. Russian River - red salmon (early run)	3.00	2,130,000
Russian River - red salmon (late run)	0.30	211,000
20. Lower Kenai streams - all species	2.77	1,970,000
Lower Kenai streams - king salmon	0.71	503,000
22. Deep Creek Marine - halibut	3.32	2,357,000
Deep Creek Marine - king salmon	1.76	1,253,000
23. Kachemak Bay - halibut	7.56	5,364,000
24. Resurrection Bay - silver salmon	1.27	902,000

<sup>1</sup> Refer to Table 8-2 and 8-3 for site descriptions.

<sup>2</sup> Derived by dividing the aggregate net WTP estimates by 709,951 total choice occasions over the season.

Note: Net WTP values were not estimated for Campbell Creek - rainbow trout, Talachulitna River - rainbow trout, or Lower Kenai streams - steelhead because of insufficient data.

Table 8-11. Winter Fishing Areas and Corresponding Sites

Fishing Area	Sites	Number of Trips	
		Reported	Used
Big Lake	Big Lake	127	105
Kepler Complex	Kepler, Bradley, Echo, Long, and Matanuska Lakes	71	67
Anchorage Area Lakes	Six Mile, Jewel, Sand, Fire, Other, Clunie, Triangle, Unnamed Lake/Elmendorf AFB, Taku, Cheny, Beach, and Fish Lakes	89	76
Lakes Louise, Susitna, Tyone	Lake Louise, Lake Susitna, Lake Tyone	95	70
Kenai Peninsula	Hidden Lake, Engineer Lake, Skilak Lake, Jeans Lake, Watson Lake	56	32
Fairbanks 1	Chena Lake, Harding Lake, Birch Lake	145	129
Fairbanks 2	Quartz Lake	94	90

Table 8-12. Approximate One-Way Distances (in Miles) from  
Origin Zones to Winter Fishing Areas

Origin Zones	Fishing Area						
	Big Lake	Kepler Complex	Anchorage Area Lakes	Lakes Louise, Susitna, and Tyone	Kenai <sup>1</sup> Peninsula	Fairbanks <sup>2</sup> 1	Fairbanks <sup>3</sup> 2
1. Homer, Seldovia	270	275	225	400	130	550	510
2. Anchor Point, Ninilchik	245	250	200	375	105	575	535
3. Clam Gulch, Kasilof	210	215	165	340	70	540	500
4. Kenai, Nikiska	205	210	160	335	60	535	495
5. Soldotna, Sterling, Cooper Landing	195	200	150	320	50	470	430
6. Seward, Moose Pass	170	175	125	300	45	450	410
7. SW Anchorage Area	60	65	10	190	95	390	350
8. SE Anchorage Area	55	60	10	180	95	380	340
9. NW Anchorage Area	45	50	10	175	110	375	335
10. NE Anchorage, Eagle River	35	40	10	165	110	365	325
11. Palmer, Sutton	25	5	50	115	150	355	315
12. Wasilla	10	15	140	130	140	340	300
13. Big Lake, Willow	40	45	70	160	170	310	270
14. Talkeetna, Trapper Creek	85	90	115	205	215	280	240
15. Glennallen	160	140	185	40	285	285	245
16. Fairbanks	330	340	365	285	460	40	80

1 Includes Hidden Lake, Engineer Lake, Skilak Lake, Jeans Lake, Watson Lake.

2 Includes Chena Lake, Harding Lake, Birch Lake.

3 Quartz Lake

and the intercepts vary by site as follows:

-2.20 (-5.87)	for Big Lake
-2.65 (-6.91)	for the Kepler Lake Complex
-3.15 (-7.46)	for the Anchorage Area Lakes
$\alpha_i =$ -0.21 (-0.69)	for Lakes Louise, Susitna, and Tyone
-0.78 (-2.42)	for the Kenai Peninsula
-0.37 (-6.58)	for Fairbanks 1
0.0 (normalized)	for Fairbanks 2

\*t-statistic

As described in the previous section, Hanemann (1985) shows how measures of an individual's willingness to pay ("consumer's surplus") for the opportunity to fish at a particular fishing area can be derived from a logit model such as (25). The formula is a function of the price coefficient--in this case -0.0744 --and the individual's predicted probability of selecting the given area:

$$WTP_i = \frac{-\log(1 - \pi_i)}{0.0744} \quad (26)$$

The quantity  $WTP_i$  is the amount that the individual would be willing to pay (over and above his actual expenses) to ensure the availability of the area each time he goes on a sport fishing trip during the winter.  $WTP$  is, therefore, a measure of value per trip--not per trip to this particular area, but per trip to any winter fishing area. Accordingly, we refer to  $WTP_i$  as the willingness to pay "per choice occasion."

The higher  $\pi_i$ , the greater the probability of selecting this area when a trip is made and, correspondingly, the greater the value that is placed on this area. Since travel costs vary by individual, the  $WTP_i$  values vary by individual. Estimates of  $WTP_i$  for individuals from different origin zones to the four areas identified in the list of study objective sites (see Table 1-1) are shown in Table 8-13.

Table 8-13. Estimated Willingness to Pay (WTP) per Choice Occasion for Winter Fishing at Selected Sites in Southcentral Alaska, by Origin of Residence

Origin Zone	Fishing Area							
	Big Lake		Kepler Complex		Anchorage Area Lakes		Lakes Louise, Susitna, Tyone	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
3. Clam Gulch, Kasilof	\$0.35	\$0.35	\$0.19	\$0.19	\$0.52	\$0.52	\$0.53	\$0.53
4. Kenai, Nikiska	1.44	1.15	0.83	0.66	1.14	1.06	1.54	0.70
5. Soldotna, Sterling, Cooper Landing	0.47	0.03	0.27	0.02	0.38	0.10	0.67	0.00
6. Seward, Moose Pass	0.05	0.05	0.03	0.03	0.19	0.19	0.00	0.00
7. SW Anchorage	4.02	4.39	2.08	2.25	8.39	8.32	1.26	0.66
8. SE Anchorage	4.41	4.37	2.33	2.37	5.63	5.03	2.28	2.06
9. NW Anchorage	4.48	4.65	2.37	2.53	4.17	3.19	2.96	3.33
10. NE Anchorage, Eagle River	5.77	6.15	2.99	3.15	3.72	4.02	2.41	1.81
11. Palmer, Sutton	4.66	4.09	4.77	3.66	0.91	0.91	5.38	6.81
12. Wasilla	5.54	4.89	2.65	2.68	0.86	0.97	5.45	6.16
13. Big Lake, Willow Creek	10.68	11.03	4.29	4.79	0.85	1.06	1.68	0.83
14. Talkeetna, Trapper Creek	6.80	6.80	3.44	3.44	1.07	1.07	2.55	2.55
16. Fairbanks	0.02	0.01	0.01	0.00	0.00	0.00	0.20	0.10
ALL ORIGINS	\$3.03	\$4.09	\$1.79	\$2.18	\$2.22	\$0.90	\$1.94	\$0.88

Note: No residents reporting trips from origin zones 1, 2, and 15.

As suggested by the results in this table, each fishing area caters to residents of different origin zones. It appears that, on the whole, Alaska residents do not travel long distances for winter fishing but instead tend to visit relatively local sites. Consequently, for residents of a given origin zone, a few areas are valued very highly for fishing, whereas the other areas have a relatively low value. Big Lake, the Kepler Complex, and Anchorage area lakes are valued primarily by residents of the Anchorage area, whereas Lake Louise, Susitna, and Tyone are valued primarily by residents of Glennallen.

The number of sport fishing households in the region of interest (areas I, K, L, M, and N) is 70,244. Of these households, 24.3 percent are estimated to participate in winter sport fishing. Based on 5.6 trips per winter fishing household, 95,600 trips (or choice occasions) are estimated.

Multiplying this number of choice occasions by the mean WTP values in Table 8-13 yields an estimate of the annual net willingness to pay for each winter fishing area by Alaska residents. These values are reported in Table 8-14.

#### Nonresident Anglers

#### Demand and Net Willingness to Pay for Alaska Sport Fishing Opportunities

The travel cost method and a contingent valuation survey were used to estimate the net willingness to pay of nonresidents for sport fishing opportunities in southcentral Alaska. These approaches are described below.

Travel Cost Method. The survey of nonresident anglers provided data on the choice of sport fishing sites and species during a single fishing trip to Alaska--the most recent trip taken by the respondent. This trip could have been taken in any year between 1983 and 1986, and in any period during that year.

A number of respondents visited more than one site or fished for more than one target species on their trip. To analyze their site and species selections, the survey responses were examined and, in each case, a primary fishing site and species were determined. The criteria used to determine the primary site/species, in order of importance, are described below.

The predominant factor in selecting a primary site and species was the number of days spent fishing at a site. If the respondent indicated that he stayed at a particular site significantly longer than at any other site, that site was designated as the primary site. A second important factor used in selecting primary sites was the distance of sites visited from the

Table 8-14. Annual Net Willingness to Pay (WTP) for  
Winter Sport Fishing at Selected Fishing  
Areas in Southcentral Alaska

Fishing Area	Annual Net WTP
Big Lake	\$289,700
Kepler complex	171,100
Anchorage area lakes	208,400
Lakes Louise, Susitna, Tyone	185,500



point of entry into Alaska. Sites located further from the point of entry were generally assigned as the primary site if no significant difference was found in days fished at the sites visited. In cases where sites visited were about equidistant from the point of entry, species selection and the use of guide services were considered. The selection of salmon and halibut as a target species and the use of guide services at a site were criteria used to assign that site as a primary site. Altogether, sufficient data were available to analyze 26 separate site/species sport fishing activities; these site/species combinations are shown in Table 8-15.

Nonresidents' choice among these alternatives was analyzed using a standard logit model. The sample included nonresidents who had sport fished in Alaska between 1983 and 1986. The main explanatory variable used in the analysis was round trip travel cost from the respondent's place of residence (outside Alaska) to the respondent's primary Alaskan site. These costs included three components: fixed, quasi-fixed, and variable costs. Fixed costs were calculated using round trip air fares from the largest city in each respondent's state (or country) to the Alaska point of entry. Quasi-fixed costs included expenditures reported for camping, hotels, guides, and/or car rental, where applicable. Variable costs included transportation costs to sites based on either a cost per mile for motor vehicles (e.g., \$0.12/mile for cars, \$0.24/mile for RVs) or local airfares.

Because trips by nonresidents occur relatively infrequently and are generally planned in advance, these trips were considered less responsive to fluctuations in fishing quality than trips made by resident anglers. Consequently, an index of fishing quality for each site/species alternative was not developed for the analysis; instead, a separate intercept that captures both differences in preferences, and differences in quality among these alternatives was estimated for each site/species alternative. The fitted logit model is:

$$\pi = \text{Pr \{nonresident selects site/species } i \} = \frac{e^{v_i}}{\sum_{j=1}^{26} e^{v_j}}$$

where:

$$v_i = \alpha - 0.002817 \text{ round-trip travel cost} \\ (-12.95)$$

Restricted Log Likelihood: -2540  
Maximized Log Likelihood: -1999

The estimates of the intercepts,  $\alpha_i$ , together with the t-statistics are presented in Table 8-15.

Table 8-15. Parameter and Net Willingness to Pay (WTP) Estimates from the Nonresident Angler Demand Model

Area/Site/Species	Estimate of $\alpha_i$	T-Statistic	Mean WTP, Per Choice Occasion	Aggregate Annual WTP <sup>1</sup>
<u>Southcentral Alaska</u>				
All sport fishing	NA	NA	\$305.13	\$30,385,100
King salmon (all sites)	NA	NA	88.49	8,811,900
Halibut (all sites)	NA	NA	35.41	3,526,200
Razor clams (all sites)	-2.877	(-6.83)	2.70	268,900
Kenai River				
King salmon	0	(normalized)	53.83	5,360,400
Silver salmon	-1.145	(-5.87)	16.12	1,605,200
Other species	-1.560	(-6.77)	10.50	1,045,600
Russian River - red salmon	-1.754	(-7.18)	9.11	907,200
Lower streams in the Kenai Peninsula - all species	-2.265	(-7.13)	4.98	495,900
Deep Creek Marine				
King salmon	-2.429	(-6.97)	4.06	404,300
Halibut	-2.835	(-6.73)	2.70	268,900
Kachemak Bay				
Halibut	-0.445	(-2.71)	27.20	2,708,600
Other species	-2.308	(-6.62)	4.07	405,300
Resurrection Bay				
Silver salmon	-2.350	(-7.08)	4.52	450,100
Other species	-1.763	(-6.89)	8.19	815,600
Other Kenai Peninsula - all species	-2.190	(-7.43)	5.89	586,500
Little Susitna River - all salmon	-2.458	(-7.40)	4.52	450,100
West side Susitna streams				
King salmon	-1.534	(-5.15)	5.87	584,500
Other species	-1.701	(-5.31)	4.96	493,900
East side Susitna roadside streams - all salmon	-2.947	(-6.99)	2.70	268,900
Glennallen area - all species	-2.364	(-7.12)	4.52	450,100
Anchorage area - all species	-2.263	(-7.67)	5.89	586,500
Prince William Sound - all species	-1.396	(-6.05)	10.50	1,045,600
<u>Southeast Alaska</u>				
Juneau area				
Marine - all species	-0.553	(-2.84)	18.20	1,812,400
Roadside - all species	-1.995	(-5.68)	4.19	417,200
Other southeast (including other freshwater - Juneau) - all species	1.662	(11.12)	104.37	10,393,300
<u>Southwest Alaska</u>				
All sport fishing	1.759	(8.95)	43.53	4,334,800
<u>Other Alaska</u>				
Fairbanks area - all species	-1.324	(-5.93)	11.45	1,140,200
Other - all species	0.871	(3.56)	15.27	1,520,600

<sup>1</sup> Based on 99,581 household trips (i.e., "choice occasions") made in 1986  
NA = Not applicable because no parameter is estimated.

This model of site/species selection is conditional on nonresidents making a fishing trip to Alaska. Accordingly, the surplus values derived from this choice model using the methodology of Hanemann (1985) are values per nonresident trip to Alaska. The formula is:

$$WTP_i = \frac{-\log (1-\pi_i)}{.002817} \quad (27)$$

where .002817 is the coefficient on price (i.e., round trip travel cost).

The quantity WTP is the amount that a nonresident angler would be willing to pay (over and above his actual expense) to ensure the availability of a particular site/species alternative (or set of alternatives) whenever he makes a sport fishing trip to Alaska, and  $\pi$  is the probability that he would select that particular alternative (or set of alternatives). The quantity WTP was calculated for each respondent in the sample; mean values per choice occasion, and for the 1986 season as a whole, are reported in Table 8-15.

Contingent Valuation Survey. For nonresidents a discrete-response contingent valuation survey was conducted of the type originally developed by Bishop and Heberlein (1979) and subsequently analyzed by Hanemann (1984, 1985). Respondents were asked whether they would have made their most recent trip to Alaska if the cost had been higher by varying amounts. Each survey included one of two sets of cost increases: either \$100, \$200, \$400 or \$150, \$300, \$600.

Three groups of nonresident anglers were used in the analysis. Group 1 consisted of all respondents, regardless of trip destination. Group 2 consisted of respondents whose primary destination (see explanation above) was to a site within southcentral Alaska. Group 3 consisted of respondents whose primary destination was to a site outside southcentral Alaska. The proportion of respondents in each of these groups willing to pay the additional increment of transportation costs are shown in Table 8-16.

A probit model was then fitted to these data. For group 1, the model yielded the following results:

Pr {Willing to pay an extra \$A to visit Alaska} =

$$\Phi (5.852 - 1.087 \ln A) \\ (21.97) \quad (-22.41)$$

where A is the increment of increased transportation costs and the t-statistic is in parentheses. (This equation produces a Z

Table 8-16. Results of the Nonresident Angler  
Contingent Valuation Survey

Amount Increase in Transportation Costs	Sample Size	Proportion of Respondents Willing to Pay This Amount	
		Actual Percent (%)	Predicted Percent (%)
GROUP 1 - All Respondents			
\$100	427	78	80
150	387	69	66
200	427	53	54
300	387	38	36
400	427	24	25
600	387	15	14
GROUP 2 - Primary Site within Southcentral Alaska			
\$100	204	77	79
150	207	64	64
200	204	51	51
300	207	35	34
400	204	22	24
600	207	14	12
GROUP 3 - Primary Site Outside Southcentral Alaska			
\$100	223	80	82
150	180	73	68
200	223	55	56
300	180	42	38
400	223	23	27
600	180	14	15

score, which is then converted to a probability using a normal probability distribution.)

For groups 2 and 3 in which a primary destination was specified, the model yielded the following results:

Pr {Willing to pay an extra \$A to visit Alaska} =

$$\begin{array}{rcccl} 5.907 & - & 1.087 \ln A & - & 0.1103 \text{ (SC dummy)} \\ (22.03) & & (-22.39) & & (-2.01) \end{array}$$

where A is the increment of increased transportation costs and SC dummy is a dummy variable taking on the value 1 if the primary site is in southcentral Alaska, and 0 otherwise. (As above, this equation produces a Z score, which is then converted to a probability.)

The predicted probabilities using these models are also shown in Table 8-16. Using these probabilities and the methodology developed by Hanemann (1984, 1985), the median and mean values of nonresidents' net willingness to pay for sport fishing in Alaska can be calculated. For the entire sample of nonresidents, regardless of site (group 1), the median and mean values are \$217 and \$332, respectively. For nonresidents whose primary site destination was in southcentral Alaska (group 2), the median and mean net willingness to pay values are \$207 and \$315. For nonresidents whose primary site destination was outside southcentral Alaska (group 3), the median and mean values are \$229 and \$349. These estimates are consistent with the results from the travel cost model which implies a mean value of \$305 per trip for sport fishing in southcentral Alaska.

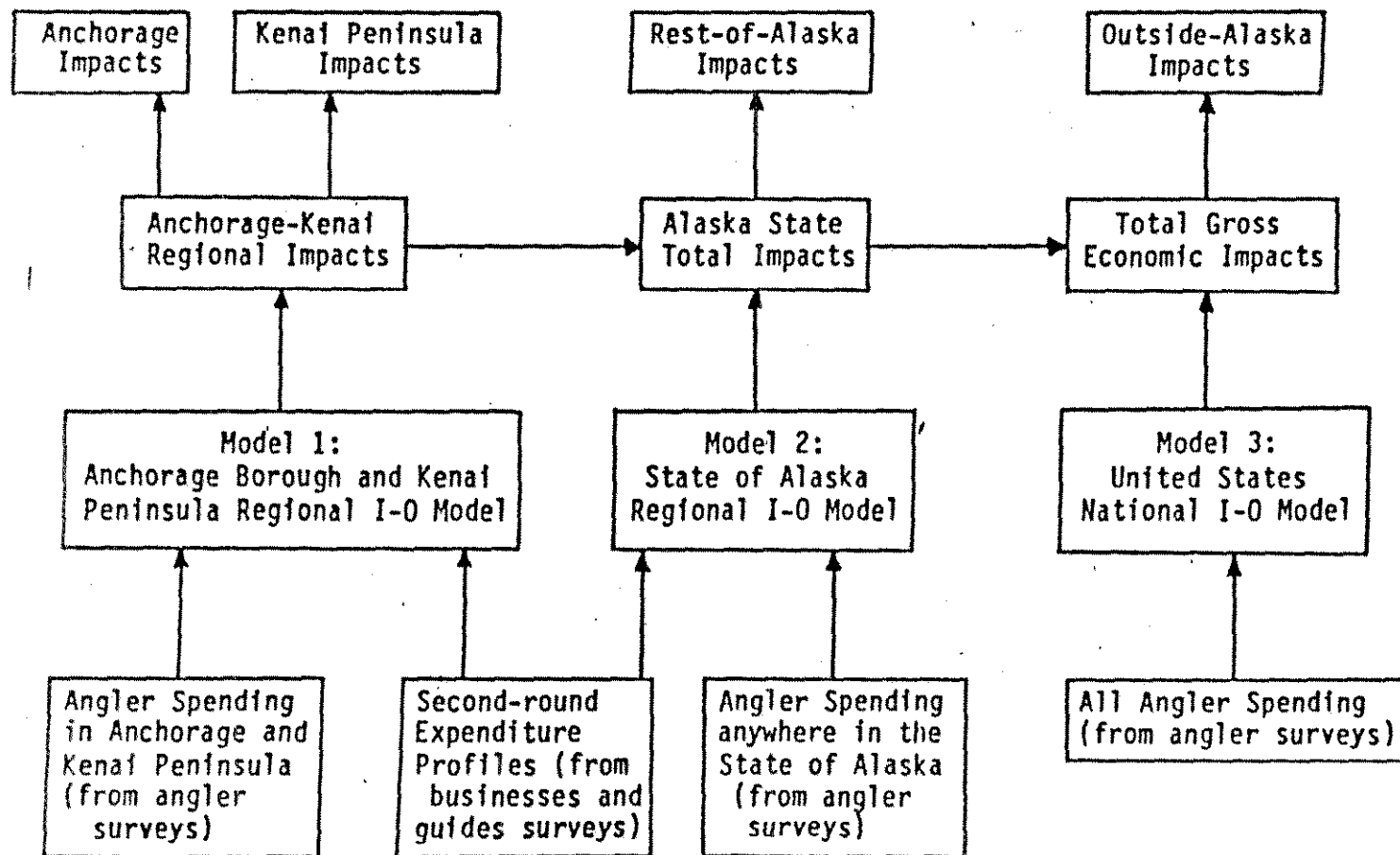
## Economic Impacts

### Overview

The main objective of this analysis is to estimate the total economic impact associated with sport fishing in southcentral Alaska. This economic impact is described in terms of sales, employment, and income, and is disaggregated primarily into three geographic divisions: Anchorage area, Kenai Peninsula, and the rest of Alaska. Economic impacts to areas outside Alaska also are estimated, but impacts to particular areas beyond the state's boundaries are not specified.

Input-output (I-0) methodology is used to perform this analysis, as it is well-suited to consideration of total (as opposed to direct) economic impacts. The methodology also provides a straightforward way to further disaggregate impacts in terms of industrial sectors. Three separate I-0 models are employed (Figure 8-2):

FIGURE 8-2. ECONOMIC IMPACT ANALYSIS LINKAGES: SURVEY DATA, MODELS, IMPACT ESTIMATES



- o I-0 model 1 provides estimates of total economic impacts (direct, indirect, and induced) for the Anchorage area and Kenai Peninsula. (These areas correspond to the respective boroughs.) This model has three parts. In the first part, the only input is angler spending in the Anchorage area ; only sales, employment, and income impacts on Anchorage businesses and workers are considered. The corresponding single-area second part deals with inputs and impacts only to and on the Kenai Peninsula. The third part considers both the Anchorage area and Kenai Peninsula together. Angler spending in either locale is input to the model, and the overall economic impacts to the two-area region are considered. To the extent that economic linkages exist between the Anchorage area and the Kenai Peninsula, these impacts are greater than the sum of impacts derived from the first two parts. Allocation of these excess effects to each of the two areas is performed with a related procedure.
- o I-0 model 2 examines effects on the rest of Alaska. Angler spending elsewhere in Alaska--outside the Anchorage-Kenai Peninsula region--is input to the model. Sales, employment, and income impacts to these remaining Alaska areas are the results of interest here. A model of the Fairbanks area serves this purpose.
- o I-0 model 3 takes as input the sum total of a year's worth of southcentral Alaska angler spending and, following subtraction of the results from I-0 models 1 and 2, provides estimates of economic impacts that result in areas outside Alaska.

The analysis involves three main steps, each of which is described more fully in the following sections. In the first step, southcentral Alaska angler spending is quantified by extrapolation of responses from the resident and nonresident angler surveys. These spending estimates, specific to business type and geographic area, are used as the final demand changes (direct effects on sales) that are input to the I-0 models. In step two, the I-0 models are prepared. Input-output accounts of the United States economy comprise model 3, and both primary and secondary data sources are used to "regionalize" these U. S. interindustry relations to bring them into conformity with the areas covered by the other models. The I-0 models are then applied in step three. Here the final demand changes attributed to southcentral Alaska sport fishing, quantified in step one, are input to the models prepared in step two. Estimates of impacts on total sales, employment, and income for each of the various geographic divisions are obtained in this step.

### Quantifying Angler Expenditures

All spending by anglers in support of sport fishing in southcentral Alaska during the 1986 season must be accounted for to accurately estimate the economic impacts of interest. The resident angler sample represents the nearly 105,000 fishing households in the region extending from the Fairbanks area through the Kenai Peninsula. These households accounted for more than three-fourths (76.4 percent) of the fishing households in the State of Alaska in 1986. Together with about 2,200 fishing households in the Prince William Sound area, these angling households account for nearly all of the approximately 930,000 fishing trips made by resident anglers to southcentral Alaska sites that year, and for about 70 percent of all resident fishing trips in the state. The nonresident angler sample represents all of the out-of-state anglers participating in sport fishing in Alaska during 1986. These nonresident anglers spent more than 200,000 days fishing at southcentral Alaska sites during 1986, equivalent to 52.5 percent of all nonresident fishing days in the state. Overall spending estimates--including both resident and nonresident anglers fishing in southcentral Alaska--are prepared on the basis of the two samples.

Resident anglers were asked to identify their "household's total fishing-related expenditures" over the course of 1 year (October 1985-September 1986). About half of these anglers detailed their spending by type of business and for businesses in Alaska only. These respondents provided spending estimates according to the area in which purchases were made--Anchorage area, Kenai Peninsula, Juneau area, and other Alaska. The rest of the resident angler sample detailed their spending by type of good or service, and not only broke down the estimates by the four Alaska regions but also listed spending made outside the state. For this analysis, average annual household spending profiles for the resident anglers were prepared separately for residents of the Kenai Peninsula (Table 8-17), Anchorage area residents (Table 8-18), and Fairbanks area residents (Table 8-19).

Instead of a full year of purchases, nonresident angler households were asked to estimate their fishing-related expenditures made for or during their most recent trip to Alaska in which they sport fished (Table 8-20). Similar to the resident anglers, however, about half of the nonresidents detailed their Alaska-only expenditures by business type, and the rest detailed their spending (in and out of Alaska) by type of commodity.

Both profiles of spending by business type and the profiles by commodity type are useful for the analysis. Without exception, the profiles show that anglers estimate higher total expenditures when these are detailed by business than when detailed by commodity type. In all likelihood, the estimates by business type reflect some spending that is not associated with sport fishing, and thus are systematically biased upward. The



Table 8-17. Kenai Peninsula Resident Angler Households -  
Average Annual Sport Fishing-Related Spending

A. SPENDING BY BUSINESS TYPE

Type of Business in Alaska	Average Total	Location Where the Money Was Spent							
	Spending (Oct. 1985- Sept. 1986)	=	Anchorage Area	+	Kenai Peninsula	+	Juneau Area	+	Fairbanks & Other AK
Department/sporting good stores	\$194.22		\$17.43		\$179.03		\$0.00		\$1.32
Lodging places	11.45		0.00		16.23		0.00		0.00
Mail order catalogues	54.34		0.00		28.96		0.00		0.00
Retail food and liquor stores	170.01		30.26		140.97		0.00		6.58
Restaurants	77.89		5.26		69.81		0.00		5.26
Service stations	150.25		8.55		136.51		0.00		9.87
Transportation (e.g., air taxi operators, travel agencies, airlines, etc.) <u>not</u> including guide business	21.02		0.66		14.87		0.00		7.24
Guide businesses	9.46		0.00		10.19		0.00		0.00
Fish packing/processing businesses	7.49		0.00		7.92		0.00		0.00
Marine boats and accessory stores	401.75		10.46		266.23		0.00		0.00
Other businesses	34.94		0.13		37.53		0.00		0.00
TOTAL	\$1,132.82		\$72.75		\$908.25		\$0.00		\$30.27

B. SPENDING BY TYPE OF COMMODITY

Fishing-related Expenditures	Average Total Spending (Oct. 1985- Sept. 1986)	=	Location Where the Money Was Spent								
		Anchorage Area	+	Kenai Peninsula	+	Juneau Area	+	Fairbanks & Other AK	+	Outside AK	
Food and beverages	\$137.16		\$7.70		\$115.41		\$0.00		\$9.46		\$5.41
Hotels/lodges/campgrounds	11.84		0.00		10.30		0.00		0.00		0.00
Cabin/campsite improvements	13.77		0.00		14.32		0.00		0.00		0.00
Tackle/gear/clothing	138.25		6.49		111.89		0.00		0.00		18.38
Equipment rental	10.13		0.14		3.92		0.00		0.00		0.00
Fish processing	7.56		0.95		9.22		0.00		0.00		0.00
Licenses	17.25		0.54		16.12		0.00		0.00		0.68
Guide/access fees	13.44		0.00		8.99		0.00		0.00		0.00
Motor vehicle-related expenses	78.25		3.38		66.96		0.00		6.76		0.68
Boat-related expenses	115.70		1.35		82.55		0.00		1.35		35.14
Place-related expenses	11.69		3.38		8.78		0.00		0.00		0.00
Insurance	92.66		0.00		69.39		0.00		0.00		27.03
Package fishing trips	6.49		0.00		6.76		0.00		0.00		0.00
Other expenses	16.17		0.00		14.12		0.00		0.00		2.70
TOTAL	\$670.36		\$23.93		\$538.73		\$0.00		\$17.57		\$90.02

Note: Total may not add up, due both to rounding and to missing responses in the locational breakdown.

Table 8-18. Anchorage Area Resident Angler Households -  
Average Annual Sport Fishing-Related Spending

A. SPENDING BY BUSINESS TYPE

Type of Business in Alaska	Average Total Spending (Oct. 1985- Sept. 1986)	Location Where the Money Was Spent				
		= Anchorage Area	+ Kenai Peninsula	+ Juneau Area	+ Fairbanks & Other AK	
Department/sporting good stores	\$162.44	\$127.22	\$15.66	\$0.11	\$7.92	
Lodging places	38.89	4.51	18.66	0.11	15.01	
Mail order catalogues	45.37	25.35	3.17	0.00	2.76	
Retail food and liquor stores	173.94	115.09	35.87	0.00	14.64	
Restaurants	85.18	23.51	46.16	0.39	13.47	
Service stations	175.00	94.42	54.71	0.00	20.40	
Transportation (e.g., air taxi operators travel agencies, airlines, etc.) <u>not</u> including guide business	70.31	37.62	5.16	0.00	10.04	
Guide businesses	29.35	3.44	25.63	0.00	4.73	
Fish packing/processing businesses	8.77	5.08	2.86	0.00	0.11	
Marine boats and accessory stores	147.90	104.62	25.66	0.00	6.90	
Other businesses	37.81	28.33	5.11	0.00	2.43	
TOTAL	\$974.96	\$569.19	\$238.65	\$0.61	\$98.41	

B. SPENDING BY TYPE OF COMMODITY

Fishing-related Expenditures	Average Total Spending (Oct. 1985- Sept. 1986)	Location Where the Money Was Spent					
		= Anchorage Area	+ Kenai Peninsula	+ Juneau Area	+ Fairbanks & Other AK	+ Outside AK	
Food and beverages	\$204.37	\$99.60	\$70.34	\$1.28	\$16.03	\$0.65	
Hotels/lodges/campgrounds	49.27	4.95	26.80	0.22	18.32	0.00	
Cabin/campsite improvements	91.10	73.97	17.36	0.09	4.95	0.00	
Tackle/gear/clothing	112.74	86.17	15.06	0.07	5.13	1.95	
Equipment rental	4.77	6.07	4.34	0.55	0.02	0.00	
Fish processing	5.61	3.86	1.71	0.00	0.00	0.00	
Licenses	17.79	13.95	1.79	0.00	0.60	0.97	
Guide/access fees	20.93	3.66	11.79	2.20	4.54	0.00	
Motor vehicle-related expenses	98.59	49.16	37.60	0.37	9.87	0.44	
Boat-related expenses	95.90	33.95	25.15	0.00	4.28	0.00	
Place-related expenses	65.79	49.79	4.96	0.37	8.06	0.00	
Insurance	60.11	41.44	6.70	0.00	12.60	0.00	
Package fishing trips	17.45	3.11	9.93	0.00	1.83	0.00	
Other expenses	21.36	9.36	7.36	0.00	1.28	0.00	
TOTAL	\$865.78	\$479.04	\$240.89	\$5.15	\$87.51	\$4.01	

Note: Total may not add up, due both to rounding and to missing responses in the locational breakdown.

Table 8-19. Fairbanks Area Resident Angler Households -  
Average Annual Sport Fishing-Related Spending

A. SPENDING BY BUSINESS TYPE

Type of Business in Alaska	Average Total Spending (Oct. 1985- Sept. 1986)	Location Where the Money Was Spent				
		= Anchorage Area	+ Kenai Peninsula	+ Juneau Area	+ Fairbanks & Other AK	
Department/sporting good stores	\$121.89	\$6.88	\$6.64	\$0.00	\$108.45	
Lodging places	38.47	5.04	9.60	0.08	23.75	
Mail order catalogues	19.00	0.00	0.00	0.00	16.48	
Retail food and liquor stores	174.64	13.92	9.60	0.00	149.12	
Restaurants	87.16	7.96	15.72	0.16	65.64	
Service stations	162.29	14.60	9.80	0.24	124.25	
Transportation (e.g., air taxi operators travel agencies, airlines, etc.) <u>not</u> including guide business	31.90	1.12	0.00	0.00	30.78	
Guide businesses	17.96	0.00	11.84	0.00	6.12	
Fish packing/processing businesses	1.24	0.60	0.24	0.00	0.40	
Marine boats and accessory stores	286.00	0.00	4.64	0.00	281.36	
Other businesses	19.30	0.16	0.00	0.00	19.14	
TOTAL	\$959.85	\$50.28	\$68.08	\$0.48	\$825.49	

B. SPENDING BY TYPE OF COMMODITY

Fishing-related Expenditures	Average Total Spending (Oct. 1985- Sept. 1986)	Location Where the Money Was Spent					
		= Anchorage Area	+ Kenai Peninsula	+ Juneau Area	+ Fairbanks & Other AK	+ Outside AK	
Food and beverages	\$165.81	\$20.45	\$16.34	\$1.70	\$110.63	\$0.45	
Hotels/lodges/campgrounds	24.63	1.43	6.69	0.00	7.12	0.00	
Cabin/campsite improvements	14.41	0.00	0.00	0.18	13.48	0.00	
Tackle/gear/clothing	59.83	1.88	2.90	0.09	50.73	1.12	
Equipment rental	6.10	0.00	0.00	0.00	1.96	4.46	
Fish processing	1.86	0.00	0.00	0.09	1.79	0.00	
Licenses	14.31	0.00	0.09	0.09	12.67	0.09	
Guide/access fees	9.10	0.89	2.68	0.89	1.25	0.00	
Motor vehicle-related expenses	134.86	19.11	11.29	0.58	99.95	0.00	
Boat-related expenses	196.36	0.00	10.40	1.43	57.05	0.00	
Place-related expenses	36.08	0.00	0.00	0.00	38.01	0.00	
Insurance	48.14	0.00	0.00	0.00	39.11	0.00	
Package fishing trips	7.42	0.00	6.70	0.00	1.12	0.00	
Other expenses	50.55	0.89	0.45	0.18	42.14	0.00	
TOTAL	\$769.46	\$44.65	\$57.54	\$5.23	\$477.01	\$6.12	

Note: Total may not add up, due both to rounding and to missing responses in the locational breakdown.

Table 8-20. Nonresident Angler Households Fishing in Southcentral Alaska -- Average Sport Fishing-Related Spending Per Trip to Alaska

A. Spending by Business Type

Type of Business	Average Total Spending	Location Where Money Was Spent							
		=	Anchorage Area	+	Kenai Penin.	+	Juneau Area	+	Other Alaska
Department/variety stores	\$79.80		\$47.97		\$22.99		0		\$8.85
Sporting goods stores	79.89		38.79		26.34		0		9.80
Air taxi operators	25.57		15.46		2.64		0		7.47
Fishing camps and lodges	66.18		29.11		23.45		0		13.62
Travel businesses (e.g. commercial airlines, travel agents, car rental)	160.01		58.56		33.22		0		59.61
Guide businesses	161.21		6.26		149.20		0		5.75
Trailer parks and campgrounds	44.93		11.59		19.10		2.30		11.94
Hotels/motels	70.51		24.13		41.44		0		9.43
Grocery stores	134.38		64.02		43.92		0		26.55
Restaurants	118.69		46.05		52.26		0		20.38
Gas stations	136.32		51.03		49.14		0		36.15
Other types of businesses	29.94		10.63		14.60		0		4.71
TOTAL	\$1,107.43		\$403.60		\$478.30		\$2.30		\$214.26

B. Spending by Type of Commodity

Expenditure Item	Average Total Spending	Location Where Money Was Spent									
		=	Anchorage Area	+	Kenai Penin.	+	Juneau Area	+	Other Alaska	+	Outside Alaska
Package fishing tour	225.31		42.62		156.53		0		4.65		21.51
Guiding fees	56.51		26.92		22.97		0		6.63		0
Transportation within Alaska	121.69		60.29		35.81		0		16.28		9.30
Fishing-related clothing	32.10		12.94		5.23		0		0		13.93
Tackle/fishing gear/equipment rental	54.31		25.40		19.97		0		2.79		6.16
Food and beverages	180.98		74.64		78.95		0		19.36		5.81
Lodging/camping fees	77.45		27.55		27.87		0		12.73		9.30
Fish processing/packaging/bait	34.70		15.14		18.74		0		0.81		0
Other fishing/related expenses	35.74		25.10		9.65		0		0.99		0
TOTAL	\$818.79 <sup>1</sup>		\$310.60		\$375.72		0		\$64.24		\$66.01

Note: Totals may not add, due both to rounding and to missing responses in the locational breakdown.

<sup>1</sup> Does not include sport fishing-related transportation costs to and from Alaska which averaged \$550.65 per angling household. Refer to text for further information on how this value was derived and used.

commodity type spending estimates, therefore, are used in this analysis, to measure the magnitude of spending by each group of anglers. These commodity type estimates also provide the only means available for measuring purchases made outside the state. The business type spending estimates, on the other hand, are more concordant with the industrial sector structure of the I-O models. The relative expenditures by business type provide a convenient way to allocate angler spending profiles to industrial sectors.

Total spending estimates are derived from these survey data for seven key industrial sectors for input to the I-O models. First, the "leakages" from Alaska are estimated from the commodity type spending profiles (Table 8-21). Next, per household spending patterns are derived by using the total spending estimates from the commodity-type profiles and proportionately allocated to industrial sectors and key geographic areas-- Anchorage area, Kenai Peninsula, other Alaska, and outside Alaska -- by reference to the business type profiles. In the next step, these spending patterns per household are multiplied to reflect the impact of all resident fishing households in each region and all nonresident household fishing days at southcentral Alaskan sites (derived from Mills 1987). The 2,189 fishing households in the Prince William Sound area (J) are included with the 11,605 Kenai Peninsula fishing households (area P) in the total spending estimates by residents of that region (Table 8-22). The Anchorage area resident spending estimates (Table 8-23) include 69,983 fishing households (areas I,K,L,M,N), and the sport fishing-related spending of 23,120 households are included in the estimates for Fairbanks area residents (area U; Table 8-24). Summed, these three sources of spending represent total expenditures of resident anglers in support of sport fishing. The portion of their total spending related specifically to fishing trips by each of these three groups to southcentral Alaska sites is estimated using the percentage of total fishing trips by each of these three groups to southcentral Alaska sites. These percentages are as follows:

Kenai Peninsula residents -	99 percent
Anchorage area residents -	95 percent and
Fairbanks area residents -	42 percent.

Spending profiles for nonresident households are converted to expenditures per fishing day (by recalculating the profiles shown in Table 8-20, dividing each household's trip costs by reported numbers of days spent fishing at each site) before extrapolating to the population of these anglers. With the exception of transportation costs to and from Alaska, total sport fishing-related spending estimates for nonresident anglers (Table 8-25) thus are prepared by multiplying these per day expenditures times the number of household fishing days to southcentral Alaska sites in 1986. This number was 129,845 days, calculated as 201,259 angler days (from the Statewide Harvest survey) divided by 1.55, the average number of household

Table 8-21. Percent of Sport Fishing-Related Spending Outside Alaska, by Angler Residence and by Industrial Sector

Industrial Sector	Anchorage Area Residents	Kenai Peninsula Residents	Fairbanks Area Residents	Non- Residents
1. Fish Packing/ Processing	0	0	0	NA
2. Boat Building/ Repair	0	29.2	0	NA
3. Passenger Trans- portation	0	0	0	2.0
4. Retail Trade	1.0	9.2	2.3	9.5
5. Hotels and Lodging Places	0	0	0	3.4
6. Eating and Drinking Places	0.3	3.9	0.3	0.7
7. Amusement/Recreation Services (Guides)	0	0	0	0
TOTAL	0.4	11.2	1.1	6.4

NA = Not available but considered minor.

Table 8-22. Estimated Total 1986 Season Sport Fishing-Related Spending by Kenai Peninsula Residents (Thousands of Dollars)

A. Total Sport Fishing-Related Spending

Industrial Sector	Location of Spending				Total Spending
	Anchorage Area	Kenai Penin	Other Alaska	Outside Alaska	
Fish Packing/Processing	\$0	\$72	\$0	\$0	\$72
Boat Building/Repair	\$68	\$1,724	\$0	\$738	\$2,530
Passenger Transportation	\$6	\$136	\$66	\$0	\$208
Retail Trade	\$468	\$4,340	\$147	\$505	\$5,460
Hotels/Lodging Places	\$0	\$148	\$0	\$0	\$148
Eating/Drinking Places	\$46	\$613	\$46	\$29	\$734
Guides	\$0	\$93	\$0	\$0	\$93
TOTAL	\$588	\$7,126	\$259	\$1,272	\$9,245

B. Spending Directly Attributable to Southcentral Alaska Fishing

Industrial Sector	Location of Spending				Total Spending
	Anchorage Area	Kenai Penin	Other Alaska	Outside Alaska	
Fish Packing/Processing	\$0	\$72	\$0	\$0	\$72
Boat Building/Repair	\$67	\$1,707	\$0	\$731	\$2,505
Passenger Transportation	\$6	\$135	\$66	\$0	\$207
Retail Trade	\$436	\$4,297	\$146	\$500	\$5,379
Hotels/Lodging Places	\$0	\$147	\$0	\$0	\$147
Eating/Drinking Places	\$46	\$607	\$46	\$29	\$728
Guides	\$0	\$92	\$0	\$0	\$92
TOTAL	\$555	\$7,057	\$258	\$1,260	\$9,130

Table 8-23. Estimated Total 1986 Season Sport Fishing-Related Spending by Anchorage Area Residents (Thousands of Dollars)

A. Total Sport Fishing-Related Spending

Industrial Sector	Location of Spending				Total Spending
	Anchorage Area	Kenai Penin	Other Alaska	Outside Alaska	
Fish Packing/Processing	\$339	\$191	\$7	\$0	\$537
Boat Building/Repair	\$6,990	\$1,714	\$461	\$0	\$9,165
Passenger Transportation	\$2,513	\$345	\$671	\$0	\$3,529
Retail Trade	\$25,819	\$7,574	\$3,192	\$376	\$36,961
Hotels/Lodging Places	\$301	\$1,247	\$1,010	\$0	\$2,558
Eating/Drinking Places	\$1,565	\$3,073	\$923	\$19	\$5,580
Guides	<u>\$230</u>	<u>\$1,712</u>	<u>\$316</u>	<u>\$0</u>	<u>\$2,258</u>
TOTAL	\$37,757	\$15,856	\$6,580	\$396	\$60,588

B. Spending Directly Attributable to Southcentral Alaska Fishing

Industrial Sector	Location of Spending				Total Spending
	Anchorage Area	Kenai Penin	Other Alaska	Outside Alaska	
Fish Packing/Processing	\$322	\$182	\$7	\$0	\$511
Boat Building/Repair	\$6,640	\$1,629	\$438	\$0	\$8,707
Passenger Transportation	\$2,388	\$328	\$637	\$0	\$3,353
Retail Trade	\$24,528	\$7,195	\$3,032	\$357	\$35,112
Hotels/Lodging Places	\$286	\$1,184	\$960	\$0	\$2,430
Eating/Drinking Places	\$1,487	\$2,920	\$877	\$18	\$5,302
Guides	<u>\$218</u>	<u>\$1,627</u>	<u>\$300</u>	<u>\$0</u>	<u>\$2,145</u>
TOTAL	\$35,869	\$15,065	\$6,251	\$375	\$57,560



Table 8-24. Estimated Total 1986 Season Sport Fishing-Related Spending by Fairbanks Area Residents (Thousands of Dollars)

A. Total Sport Fishing-Related Spending

Industrial Sector	Location of Spending				Total Spending
	Anchorage Area	Kenai Penin	Other Alaska	Outside Alaska	
Fish Packing/Processing	\$11	\$5	\$8	\$0	\$24
Boat Building/Repair	\$0	\$87	\$5,300	\$0	\$5,387
Passenger Transportation	\$21	\$0	\$580	\$0	\$601
Retail Trade	\$654	\$479	\$7,684	\$212	\$9,029
Hotels/Lodging Places	\$95	\$181	\$449	\$0	\$725
Eating/Drinking Places	\$150	\$295	\$1,236	\$5	\$1,686
Guides	\$0	\$223	\$115	\$0	\$338
TOTAL	\$931	\$1,270	\$15,372	\$217	\$17,790

B. Spending Directly Attributable to Southcentral Alaska Fishing

Industrial Sector	Location of Spending				Total Spending
	Anchorage Area	Kenai Penin	Other Alaska	Outside Alaska	
Fish Packing/Processing	\$5	\$2	\$3	\$0	\$10
Boat Building/Repair	\$0	\$37	\$2,226	\$0	\$2,263
Passenger Transportation	\$9	\$0	\$244	\$0	\$253
Retail Trade	\$275	\$201	\$3,227	\$89	\$3,792
Hotels/Lodging Places	\$40	\$76	\$189	\$0	\$305
Eating/Drinking Places	\$63	\$124	\$519	\$2	\$708
Guides	\$0	\$94	\$48	\$0	\$142
TOTAL	\$392	\$534	\$6,456	\$91	\$7,473

Table 8-25. Estimated Total 1986 Season Spending, by Nonresident Anglers  
Associated With Sport Fishing in Southcentral Alaska (Thousands of Dollars)

Industrial Sector	Location of Spending				Total Spending
	Anchorage Area	Kenai Penin	Other Alaska	Outside Alaska	
Passenger Transportation	\$1,445	\$700	\$1,309	\$70	\$3,524
Retail Trade	\$3,829	\$2,830	\$1,551	\$862	\$9,072
Hotels/Lodging Places	\$1,247	\$1,616	\$717	\$126	\$3,706
Eating/Drinking Places	\$911	\$1,034	\$403	\$17	\$2,365
Guides	<u>\$125</u>	<u>\$2,971</u>	<u>\$115</u>	<u>\$0</u>	<u>\$3,211</u>
TOTAL	\$7,557	\$9,151	\$4,095	\$1,075	\$21,878

members who sport fished during visits to southcentral Alaska sites, as derived from the nonresident angler sample.

Sport fishing-related transportation costs to and from Alaska by nonresidents were derived by calculating an average cost per household and applying this value to two groups of nonresident angling households--those in which members sport fished only at sites in southcentral Alaska, and those in which members sport fished at other Alaska locations in addition to southcentral area sites. To estimate the average cost per household, the mean transportation cost for all respondents was first calculated. This value (\$999.18) was then multiplied by the proportion of spending attributable to sport fishing. For respondents who indicated that sport fishing was the primary reason for the trip, 100 percent of transportation costs was assigned to sport fishing. For respondents who indicated that the primary reason for the trip was for reasons other than sport fishing but that they sport fished while in the Juneau area, 33 percent of transportation costs was assigned to sport fishing. An average cost per household of \$550.65 resulted. This value was then multiplied by the number of households (52,053) estimated to have sport fished only in the Juneau area, and by the number of households (7,098) estimated to have sport fished at other Alaska locations in addition to southcentral area sites. For this later group, total expenditures were then multiplied by 0.6 to account for sport fishing-related spending attributable to southcentral area sites only.

Finally, the total spending estimates impacting each geographic area are derived as the sum of resident and nonresident spending in those areas. These estimates are presented in Chapter 4 (Tables 4-2, 4-5, and 4-8) of this report.

#### Input-Output Model Calibration

I-0 model 3 is adapted directly from the most recent (1977) input-output transactions accounts prepared by the U. S. Bureau of Economics Analysis (BEA). These U. S. national accounts are used as proxies for interindustry relations affected by angler spending, even though a portion of that spending probably goes to areas outside the United States. Assuming that the portion is small, however, combined with the likelihood that the U. S. accounts are representative of interindustry linkages elsewhere, this simplification seems appropriate. For I-0 models 1 and 2, a slightly modified version of BEA's Regional Interindustry Modeling System (RIMS) is used, in conjunction with the U. S. Census Bureau's County Business Patterns for 1983, to prepare input-output matrices specific to the Alaskan regions of interest.

All of the I-0 models are aggregated (from 538 sectors covered in the U. S. transactions accounts) to 29 sectors (Table 8-26). The following sectors are included to account for

Table 8-26. Sectoring Plan for Economic Impact Analysis

Industrial Sector	BEA I-O Code Numbers
1. Agric., forestry, fisheries	1.0100 - 4.0002
2. Mining	5.0000 - 10.0000
3. M & R construction: buildings	12.0201
4. Other construction	11.0101 - 12.0216, except 12.0201
5. Fresh/frozen packaged fish	14.1200
6. Petroleum Refining	31.0101
7. Boat building/repair	61.0200
8. Other manufacturing	13.0100 - 64.1200, except 14.1200, 31.0101, and 61.0200
9. Passenger transp. and services	65.0200, 65.0400, 65.0500, and 65.0702
10. Freight transp./warehousing	65.0300 and 65.0701
11. Comm. (except rad. and TV) utilities	66.0000, and 68.0100- 68.0302
12. Other transp. and communications	65.0100, 65.0600, and 67.000
13. Wholesale trade	69.0100
14. Retail trade	69.0200
15. Banking and credit agencies	70.0100 and 70.0200
16. Insurance carriers and services	70.0400 and 70.0500
17. Real estate (except owner-occupied)	71.0200
18. Other financial and real estate	70.3000 and 71.0100
19. Hotels and lodging places	72.0100
20. Miscellaneous repair shops	73.0101
21. Equipment rental	73.0107
22. Other business services	73.0105 and 73.0109
23. Advertising	73.0200
24. Eating and drinking places	74.0000
25. Auto repair shops and services	75.0002
26. Other amusement and recreation services	76.0206
27. Other services	72.0201 - 77.0900, except 72.0100, 73.0101, 73.0107, 73.0105, 73.0101, 73.0200, 74.0000, 75.0002, and 76.0206
28. Government and special industries	78.0100 - 83.0000
29. Households	85.0000 and 91.0000

second-round purchases by guides and other businesses:

- Real estate (BEA sector 71.0200),
- Banking/credit agencies (70.0100, 70.0200),
- Equipment rentals (73.0107),
- Utilities (66.0000, 68.0100-68.0302),
- Petroleum refining (31.0101),
- Maintenance/repair construction: Buildings (12.0201),
- Auto repair shops and services (75.0002),
- Miscellaneous repair shops (73.0101),
- Wholesale trade (69.0100),
- Retail trade (69.0200),
- Insurance (70.0400, 70.0500),
- Motor freight transportation and warehousing (65.0300, 65.0701),
- Management, consulting, and other business services (73.0105, 73.0109),
- Advertising (73.0200), and
- Labor services.

Counting the sectors for which angler expenditures are detailed, along with eight general industrial sectors, these categories fully account for the interindustry structures of the various regions. Thus, the input-output accounts for these regions are summarized by matrices of I-O coefficients with 29 rows and columns each.

To account for regional leakages, the coefficient matrices for the Alaska regions were further adjusted by reference to the business sector and guides surveys. The second-round expenditures that are made outside a region, particularly a region as remote as these, are important sources of economic leakages. These leakages are as important--if not more important--than the direct spending of anglers outside the region. Whereas RIMS explicitly is designed to estimate these leakages--based on the availability of local goods and services as reflected in the County Business Patterns--the business and guides surveys are considered more reliable for two reasons: (1) the aggregate industrial sectors covered in RIMS (e.g., "Amusement and Recreation Services") cannot as explicitly reflect the individual business types catering to sport anglers as can the survey data (e.g., "Guides"); consequently, the regional distribution of expenditures estimated from RIMS is significantly influenced by expenditures of businesses not catering to anglers; and (2) a tendency to "make do" with what is available, coupled with substantially higher prices for some items, characterize remote economies, and limit the use of nationally-based purchasing patterns, such as RIMS, to estimate regional patterns. Discrepancies were clearly evident between the RIMS estimates of these leakages and the survey results, for some business types more than others, in each of the Alaska regions modeled (Figures 8-3 to 8-6).

Ideally, the columns of I-O coefficients associated with the seven key input sectors would be derived entirely from the

FIGURE 8-3. COMPARISON OF EXPENDITURES BY INDUSTRY IN THE ANCHORAGE AREA: SURVEY DATA VS. RIMS MODEL

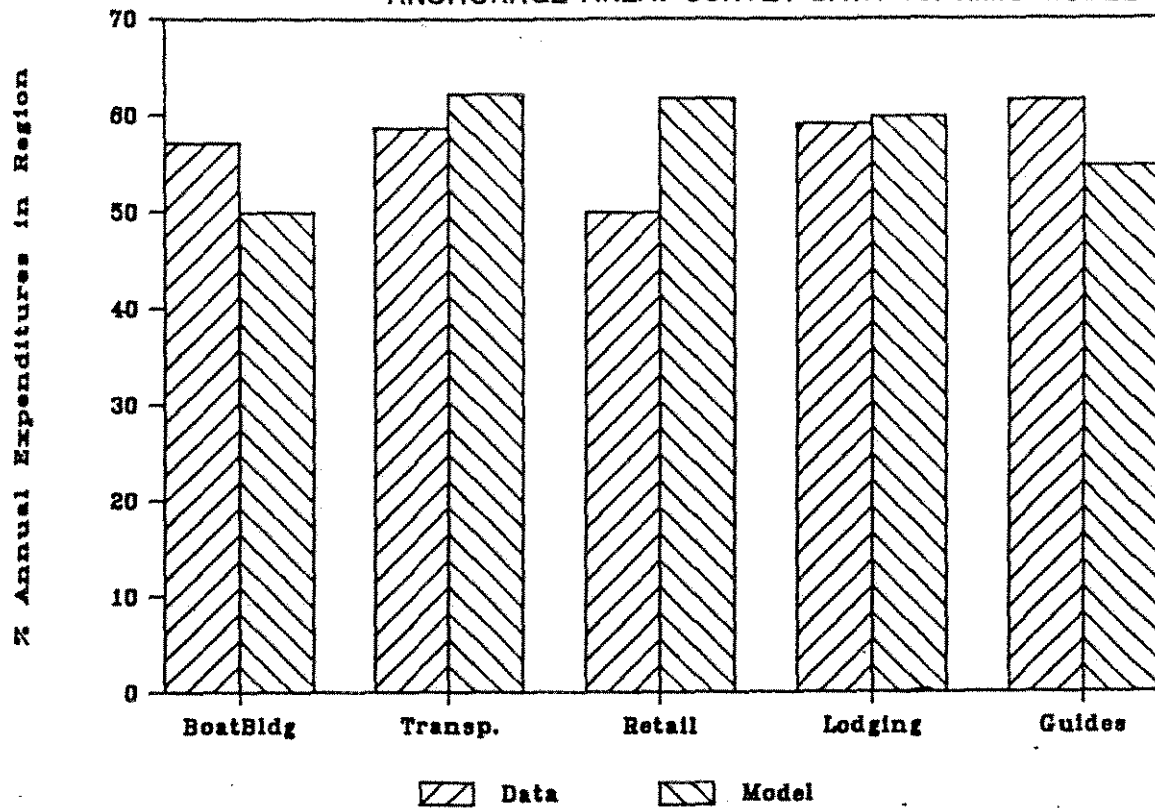


FIGURE 8-4. COMPARISON OF EXPENDITURES BY INDUSTRY IN THE KENAI PENINSULA: SURVEY DATA VS. RIMS MODEL

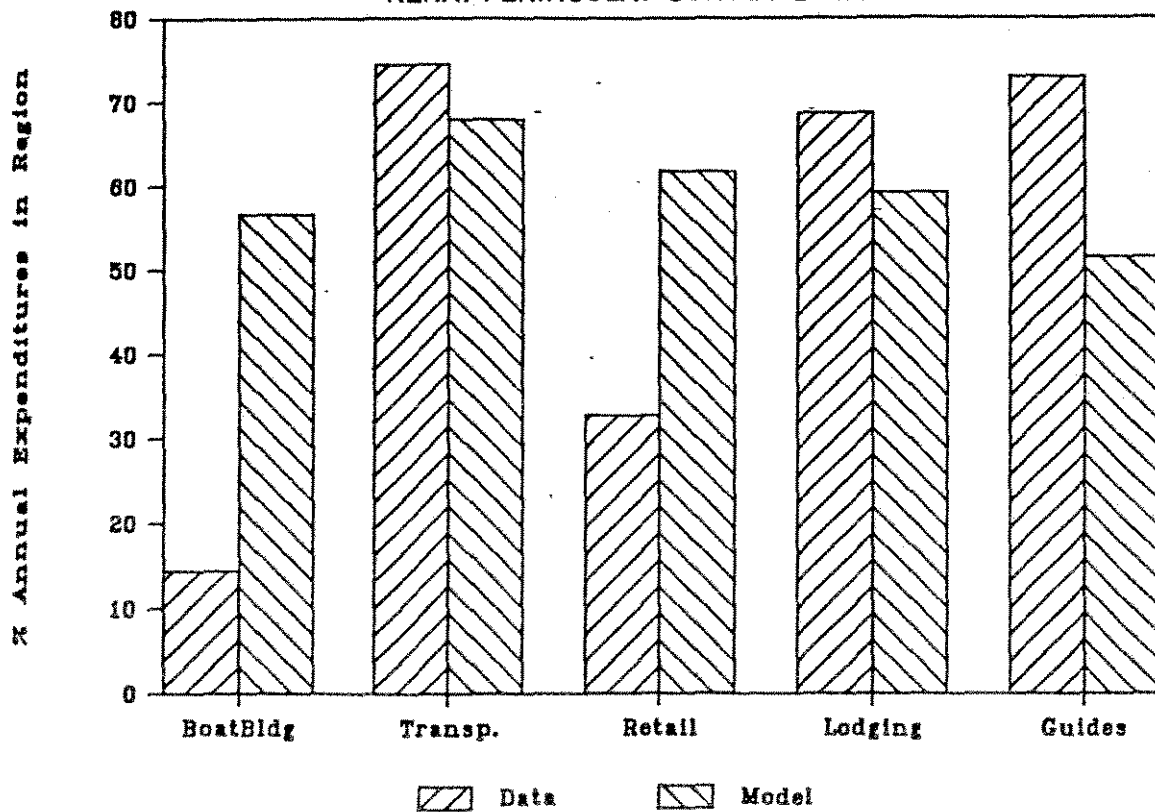


FIGURE 8-5. COMPARISON OF EXPENDITURES BY INDUSTRY IN THE ANCHORAGE AREA AND KENAI PENINSULA REGION: SURVEY DATA VS. RIMS MODEL

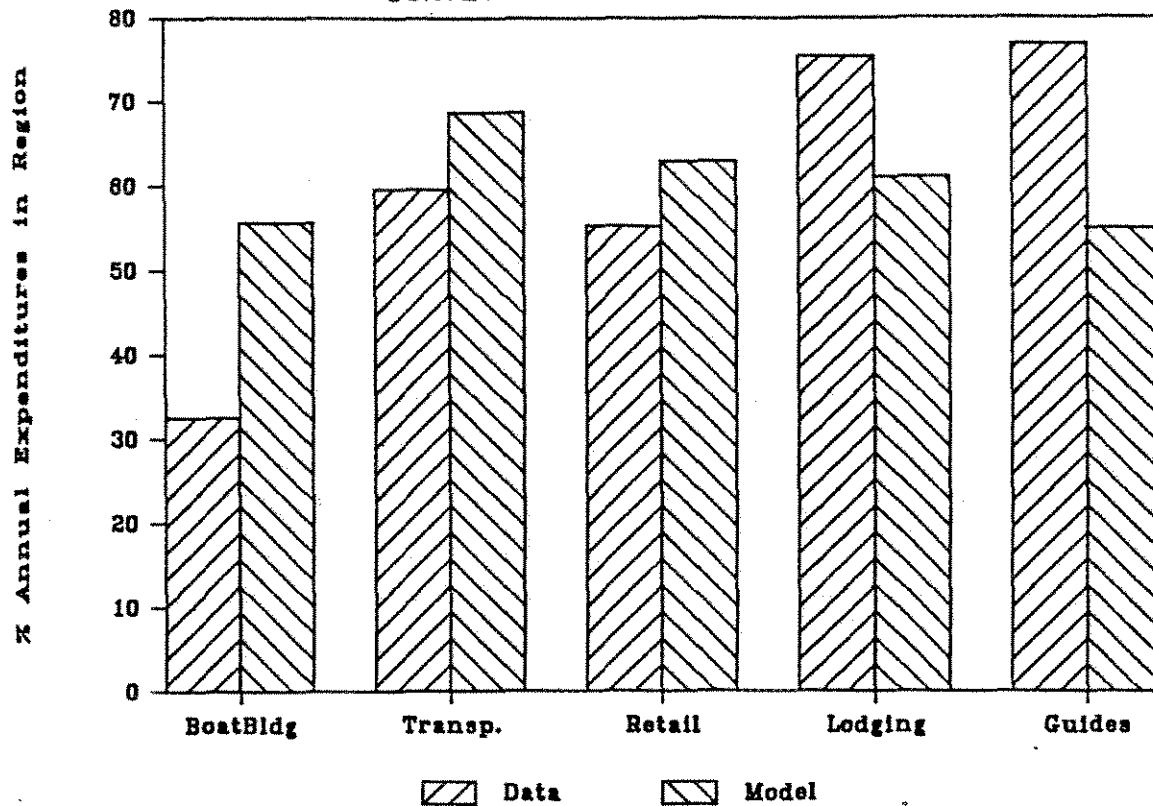
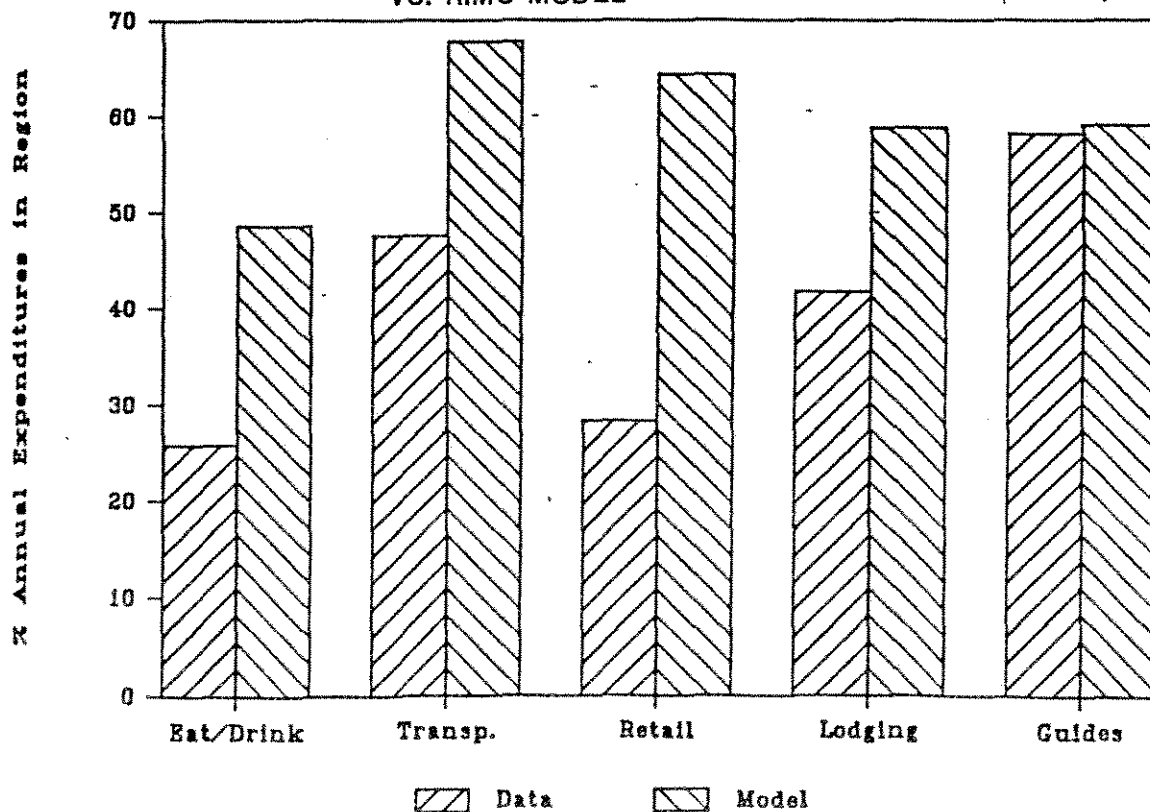


FIGURE 8-6. COMPARISON OF EXPENDITURES BY INDUSTRY IN THE FAIRBANKS/OTHER ALASKA REGION: SURVEY DATA VS. RIMS MODEL



survey data. Without similar survey data concerning the other twenty-two sectors (plus fish packing businesses which did not respond to the business survey), however, it is not possible to construct the entire matrices. The most important feature of the coefficients, from a regional economic impact modeling standpoint, has to do with the expected leakage of second (and later) round expenditures out of the region. To capture this feature accurately, therefore, the RIMS coefficients associated with six of the seven input sectors (fish packing sector excluded) were adjusted using the survey data. All coefficients of a selected column were adjusted upward or downward by a single factor, calculated as the following ratio:

$$\frac{\text{percent of in-region spending from survey data}}{\text{percent of in-region spending according to RIMS}}$$

These adjustment factors varied by sector and region (Table 8-27).

Following these adjustments, in the tradition of I-O modeling, the coefficients were subtracted from the identity matrix and the results inverted to become multiplier matrices. For the seven columns associated with angler spending, multipliers are aggregated to 9 major industrial sectors plus households. The resulting set of multipliers for each region (Tables 8-28 to 8-31) describe the total effect (direct, indirect and induced) of a unit increase in output by one of the seven key sectors, and this total effect is detailed in terms of the major sectors.

#### Economic Impact Estimation

Direct Effects. Employment and income impacts directly attributable to angler spending are estimated by reference to the businesses and guides survey data on sales, employment and payrolls. Angler expenditures in each of the three Alaska regions--sales by angler-serving firms--are translated into jobs and income according to the relationships revealed in the survey data concerning output-per-worker and worker earnings (Table 8-32). These jobs are not necessarily full-time jobs, as they are derived from the survey data and the sport fishing-related businesses surveyed employed varying degrees of part-time and temporary workers (see Chapter 3).

Two levels of angler spending are considered for each region in calculating direct effects: (1) total sport fishing-related spending, and (2) spending due solely to sport fishing at southcentral Alaska sites. Resident anglers reported their total sport fishing-related spending for the year and this spending, summed over the three resident angler areas and added to the nonresident spending, was used to calculate the first type of direct effects. This first type reflects the totality of sport fishing-related sales, employment and income in each Alaska region. The second type of direct effects only considers a portion of the resident angler spending--that portion for



Table 8-27. Factors Used to Adjust RIMS Coefficients to Account for Survey Data on Regional Spending Patterns

Industrial Sector	Anchorage Area	Kenai Peninsula	Anchorage Area + Kenai Peninsula	Fairbanks Area
Boat Building/Repair	1.14	0.26	0.58	*
Passenger Transportation	0.94	1.10	0.87	0.70
Retail Trade	0.81	0.53	0.88	0.44
Hotels/Lodging Places	0.99	1.16	1.23	0.71
Eating/Drinking Places	**	**	**	0.53
Guides (Amusement/ Recreation Services)	1.13	1.41	1.40	0.98

\* The boat building/repair sector is not explicitly represented in the Fairbanks model.

\*\* No eating and drinking places in either the Anchorage area or Kenai Peninsula responded to the business sector survey.

Table 8-28. Direct, Indirect and Induced Output Multipliers - Anchorage Area

Output Sector	Final Demand Sector*						
	1	2	3	4	5	6	7
Agric/Fisheries/Other	0.438	0.011	0.009	0.009	0.013	0.044	0.019
Mining	0.021	0.017	0.064	0.018	0.021	0.016	0.019
Construction	0.033	0.020	0.025	0.023	0.053	0.024	0.050
Manufacturing	1.060	1.061	0.102	0.047	0.052	0.092	0.054
Transp/Comm/Utilities	0.087	0.063	1.198	0.067	0.088	0.070	0.080
Trade	0.245	0.166	0.121	1.112	0.127	0.161	0.144
Finance/Insur/Real Estate	0.132	0.181	0.161	0.191	0.221	0.174	0.207
Services	0.155	0.194	0.201	0.182	1.234	1.186	1.279
Government	0.005	0.006	0.005	0.009	0.011	0.006	0.007
Households	<u>0.419</u>	<u>0.650</u>	<u>0.508</u>	<u>0.514</u>	<u>0.556</u>	<u>0.496</u>	<u>0.592</u>
Total	2.595	2.369	2.394	2.172	2.376	2.269	2.451

## \*Final Demand Sectors:

1. Fish packing/processing
2. Boat building/repair
3. Passenger transportation
4. Retail trade
5. Hotels/lodging places
6. Eating/drinking places
7. Amusement/recreation services (guides)

Table 8-29. Direct, Indirect and Induced Output Multipliers - Kenai Peninsula

Output Sector	Final Demand Sector*						
	1	2	3	4	5	6	7
Agric/Fisheries/Other	0.433	0.002	0.007	0.003	0.010	0.031	0.015
Mining	0.036	0.008	0.101	0.020	0.044	0.024	0.041
Construction	0.035	0.005	0.040	0.015	0.062	0.022	0.061
Manufacturing	1.069	1.033	0.149	0.036	0.071	0.065	0.079
Transp/Comm/Utilities	0.086	0.018	1.209	0.050	0.143	0.079	0.119
Trade	0.154	0.030	0.145	1.060	0.119	0.110	0.137
Finance/Insur/Real Estate	0.080	0.030	0.150	0.087	0.174	0.113	0.169
Services	0.094	0.031	0.163	0.074	1.166	1.104	1.204
Government	0.006	0.002	0.011	0.007	0.019	0.008	0.011
Households	<u>0.365</u>	<u>0.147</u>	<u>0.671</u>	<u>0.326</u>	<u>0.621</u>	<u>0.446</u>	<u>0.686</u>
Total	2.358	1.306	2.646	1.678	2.429	2.002	2.522

\*Final Demand Sectors:

1. Fish packing/processing
2. Boat building/repair
3. Passenger transportation
4. Retail trade
5. Hotels/lodging places
6. Eating/drinking places
7. Amusement/recreation services (guides)

Table 8-30. Direct, Indirect and Induced Output Multipliers -  
Combined Anchorage Area and Kenai Peninsula Region

Output Sector	Final Demand Sector*						
	1	2	3	4	5	6	7
Agric/Fisheries/Other	0.440	0.007	0.008	0.009	0.016	0.044	0.023
Mining	0.042	0.019	0.115	0.037	0.049	0.030	0.046
Construction	0.037	0.012	0.029	0.027	0.069	0.026	0.065
Manufacturing	1.083	1.078	0.174	0.076	0.097	0.113	0.099
Transp/Comm/Utilities	0.095	0.040	1.190	0.082	0.127	0.080	0.114
Trade	0.241	0.088	0.118	1.124	0.161	0.160	0.180
Finance/Insur/Real Estate	0.133	0.097	0.161	0.211	0.280	0.176	0.260
Services	0.156	0.104	0.192	0.199	1.293	1.186	1.344
Government	0.007	0.004	0.006	0.011	0.017	0.008	0.011
Households	<u>0.427</u>	<u>0.348</u>	<u>0.495</u>	<u>0.572</u>	<u>0.709</u>	<u>0.604</u>	<u>0.749</u>
Total	2.661	1.797	2.488	2.348	2.818	2.427	2.891

\*Final Demand Sectors:

1. Fish packing/processing
2. Boat building/repair
3. Passenger transportation
4. Retail trade
5. Hotels/lodging places
6. Eating/drinking places
7. Amusement/recreation services (guides)

Table 8-31. Direct, Indirect and Induced Output Multipliers - Fairbanks Area

Output Sector	Final Demand Sector*				
	3	4	5	6	7
Agric/Fisheries/Other	0.004	0.003	0.006	0.011	0.073
Mining	0.004	0.001	0.001	0.001	0.001
Construction	0.015	0.012	0.036	0.011	0.042
Manufacturing	0.118	0.029	0.039	0.021	0.049
Transp/Comm/Utilities	1.086	0.034	0.057	0.033	0.069
Trade	0.095	1.059	0.086	0.077	0.122
Finance/Insur/Real Estate	0.095	0.087	0.125	0.071	0.146
Services	0.123	0.084	1.133	1.073	1.193
Government	0.004	0.004	0.007	0.003	0.005
Households	<u>0.398</u>	<u>0.282</u>	<u>0.390</u>	<u>0.246</u>	<u>0.512</u>
TOTAL	1.942	1.595	1.880	1.547	2.212

3. Passenger transportation
4. Retail trade
5. Hotels/lodging places
6. Eating/drinking places
7. Amusement/recreation services (guides)

Note: Sectors 1 and 2, fish packing/processing and boat building/repair, respectively are not explicitly included in the Fairbanks I-O model due to missing or undisclosed county business patterns data on these industries in the region.

Table 8-32. Average Sales-Per-Worker and Earnings-Per-Worker for Sport Fishing-Related Businesses in Southcentral Alaska

Industrial Sector	Sales/Worker	Earnings/Worker
1. Fish Packing/Processing <sup>1</sup>	\$17,129	\$8,406
2. Boat Building/Repair	\$106,712	\$10,681
3. Passenger Transportation	\$27,655	\$10,089
4. Retail Trade	\$79,965	\$10,373
5. Hotels and Lodging Places	\$20,398	\$6,759
6. Eating and Drinking Places	\$43,000	\$8,650
7. Guides	\$15,095	\$3,883

<sup>1</sup> For the fish packing/processing sector, the sales-per-worker factor is derived from U. S. data by the Bureau of Labor Statistics, and the earnings-per-worker factor is the average of the other six sectors.

each resident angler group corresponding to the percentage of total fishing trips by the group to the southcentral Alaska sites (percentages reported above). All of the nonresident angler spending, already specific to southcentral Alaska sport fishing, is included with these resident angler portions in calculating this second type of direct effects. These latter spending totals, focusing exclusively on the impacts of southcentral Alaska sport fishing, are the ones used to estimate total economic impacts.

Total Impacts. The I-O models are used to estimate total sales (output) in each region resulting from angler spending (final demand). These total sales include the direct sales, plus indirect sales due to firms purchasing from other firms in the course of meeting their own demands, plus induced sales resulting from consumer spending by virtue of worker earnings. The total sales include not only the second-round indirect and induced effects, but also the next and later rounds, each of which is succeedingly less important. The time it takes for these total effects to be realized is indeterminate, but economic theory suggests they are achieved eventually.

Anchorage area and Kenai Peninsula impacts are calculated on the assumption that these regions have interacting economies. Total output for the two regions combined is derived using the sum of angler spending to the two regions together with the I-O model constructed for this two-region area. This combined total output is allocated proportionately, for each output sector, to the two regions on the basis of total output estimates calculated separately for each. These separately-estimated individual total outputs are derived using just the individual region I-O models and the angler spending affecting each single region.

Other Alaska total impacts result from the angler spending in other parts of Alaska coupled with the Fairbanks area I-O model (most of these other Alaska expenditures probably were made in the Anchorage area; almost no spending in the Juneau area was revealed in the survey data). Outside Alaska total impacts are calculated initially from the sum of Alaska and outside Alaska spending coupled with the United States I-O model. The total Anchorage area, Kenai Peninsula, and other Alaska impacts are subtracted from the output effects projected by this latter model to arrive at the total impact estimates for areas outside Alaska. These outside Alaska results, therefore, include the effects of leakages from the Alaska regional economies, second and later rounding indirect and induced sales outside the state resulting eventually from angler spending in the state.

Total output impacts are translated to employment and income impacts using another set of output-per-worker and earnings-per-worker relationships (Table 8-33). The output-per-worker factors are derived from U. S. level output and employment data prepared by the Bureau of Labor Statistics, the only

Table 8-33. Average U. S. Output-Per-Worker, and U. S. and State of Alaska Earnings-Per-Worker by Major Industrial Sector (1986 Dollars)

Output Sector	Output/Worker	Earnings/Worker	
		Alaska	U.S.
Agric/Fisheries/Other	\$64,431	\$5,094	\$10,405
Mining	\$325,071	\$59,574	\$28,571
Construction	\$99,941	\$46,255	\$21,173
Manufacturing	\$115,924	\$26,798	\$27,400
Transp/Comm/Utilities	\$121,763	\$37,314	\$30,224
Trade	\$40,404	\$20,562	\$14,688
Finance/Insur/Real Estate	\$150,819	\$26,756	\$17,756
Services	\$46,539	\$23,273	\$16,256
Government	\$43,183	\$31,407	\$19,695



consistent source of output data by industrial sector for all of the 9 major output sectors. These output sectors are so general as to negate even the partial use of the businesses and guides survey data for this purpose--the indirect and induced impacts span all sectors of the economy, not just those serving anglers. Total employment impacts thus calculated, furthermore, represent full-time-equivalent jobs, and thus are not in the same units as the direct employment effects discussed above. The earnings-per-worker factors are derived from industrial sector-specific income and employment data from the Bureau of Economic Analysis. Data on these variables for the State of Alaska are used to translate total employment estimates by sector to total income estimates for the Anchorage area, Kenai Peninsula, and other Alaska regions; data for the United States are used for this purpose in the case of outside Alaska impacts.

## Chapter 9

### CASE STUDY

#### Introduction

This case study uses the economic models described in Chapter 8 to analyze the impacts of closing the Kenai River to sport fishing for king salmon during the last week of July (week 13). The impacts include: 1) the loss of consumer's surplus (net willingness to pay), 2) the change in total sport fishing activity (number of trips) and the reallocation among alternative species and sites, and 3) the change in sport fishing expenditures. Because a temporal model was estimated only for resident anglers, this case study does not consider potential changes in economic values pertaining to nonresident sport fishing activity.

The resident angler model operates on a weekly basis and, at present, does not contain any explicit interactions among fishing decisions in different weeks. Consequently, while an event such as the closing of the Kenai River to sport fishing during a single week has a significant effect on angler behavior during that week, the model does not consider effects on sport fishing behavior during subsequent weeks.

#### Methodology and Results

##### Consumer's Surplus

The methodology for estimating the loss of consumer's surplus (net willingness to pay) has already been described in Chapter 8, and is based on equation (18b). This method yields an estimate of net willingness to pay per choice occasion during the week in which the closing occurs, which is then multiplied by the predicted number of choice occasions (fishing trips) during that week to obtain the aggregate net willingness to pay to avoid the closure. The associated loss in consumer's surplus from closing the Kenai River to king salmon sport fishing during week 13 is \$482,200 for resident anglers.

##### Sport Fishing Trips

Procedural Overview. The procedures for estimating the impact on the overall level and allocation of sport fishing activity by resident anglers are straightforward in principle

but computationally demanding in practice. In terms of the decision tree presented in Chapter 8 (Figure 8-1), the elimination of a given site (e.g.,  $i=1$ ) for subspecies  $r' =$  kings of macrospecies  $s' =$  salmon affects all the probabilities in the model--i.e., it affects  $\pi_{1st}$  for all  $i, r, s$  and it affects  $\pi_{1t}$ ,  $\pi_{2t}$ ,  $\pi_{3t}$ , and  $\pi_{Nt}$ . For the given species ( $r', s'$ ) it eliminates one term from the summation in the denominator in (6)--i.e., it increases the conditional probability  $\pi_{i|r's't}$  of visiting any other king salmon site. However, it also eliminates one term from the summation in (10); it reduces the inclusive value  $I_{r's't}$  associated with king salmon fishing, which in turn has two effects. One effect is to reduce the overall attractiveness of sport fishing during that week and, hence, the total number of fishing trips (via a reduction in  $I_{ft}$ ). The other effect is to reallocate the (reduced) number of trips to other subspecies of salmon (through the reduction in  $I_{r's't}$ ) and other macrospecies of fish (through the reduction in  $I_{s't}$ ).

It is relatively easy to estimate the reduction in the weekly number of fishing trips for resident anglers and the change in the conditional probabilities of visiting alternative sites, given that the angler is fishing for king salmon and that the Kenai River is closed. It is more difficult to estimate the reallocation of trips to other species and subspecies because it requires the calculation of  $\pi_{r's't}$  for all  $r$  and  $s$ , the calculation of  $\pi_{st}$  for all  $s$ , and thus the multiplication of all the terms on the right-hand side of (5). Programming these calculations for the elimination of king salmon fishing on the Kenai River in the last week of July requires virtually the same effort as constructing a general program to estimate the reallocation of fishing activity for any combination of changes in fishing quality and site availability for any subset of species and sites. To simplify these calculations for this case study, we used mean values in the sample rather than individual values reported by each respondent.

Application. The impact of closing the Kenai River on the allocation of king salmon fishing trips among the other sites is shown in Table 9-1. The first column gives the site selection probabilities for king salmon trips in week 13 under baseline condition (i.e., with the Kenai River open), evaluated for an individual with the average characteristics in the sample; the second column gives the new site selection probabilities after the two Kenai River sites have been eliminated from the choice set.

Next we consider the impact on the choice of subspecies for those who still engage in salmon fishing that week. The elimination of the Kenai River sites lowers the inclusive value associated with king salmon fishing in week 13 from 0.36186 to -0.50567. Using equation (9) this lowers the probability of selecting king salmon and raises the probability of choosing other subspecies of salmon, given that the individual takes a

Table 9-1. Probability of Taking a King Salmon Trip  
During Week 13 to Different Sites, When King  
Salmon is the Target Species

Site	Probability of Taking a Trip to Site with Kenai River Kings Available	Probability of Taking a Trip to Site without Kenai River Kings Available
1	.0118	.0351
2	.0170	.0455
3	.0039	.0097
16	.4565	--
17	.2037	--
19	.1106	.4492
22	.0450	.1338
23	.0090	.0285
24	.0195	.0566
25	.0091	.0278
26	.0084	.0249
27	.0133	.0366
28	.0747	.1231
29	.0176	.0292

salmon fishing trip. These changes are exhibited in the first four rows of Table 9-2.

The elimination of king salmon fishing at the Kenai River lowers the overall attractiveness of salmon fishing relative to the other macrospecies. The inclusive value for the salmon macrospecies in week 13 falls from 3.0754 to 2.9091. The consequent reduction in the probability of selecting salmon, and the increase in the probability of selecting other target species (or no target) for an angler making a trip in that week are shown in the middle four rows of Table 9-2.

The elimination of king salmon fishing at the Kenai River also lowers the overall attractiveness of any fishing in Alaska in week 13. The total inclusive value associated with fishing in that week,  $I_{13}$ , falls from 4.2451 to 4.174. The impact on the probability of taking one or more fishing trips in that week is shown in the last four rows of Table 9-2. The overall impact on the total number of fishing trips during week 13, obtained using the formula in equation (16), is approximately a 1.5 percent reduction. Thus, given our baseline estimate of 46,398 fishing trips in week 13, there would be a loss of about 696 fishing trips in total.

The predicted allocation of the remaining trips is based on the probabilities in the second column of Table 9-2. The total number of salmon trips is predicted to fall from 24,818 ( $=0.5349 \times 46,398$ ) to 22,878 ( $=0.5006 \times 45,702$ ) while the total number of king salmon trips falls from 6,041 ( $=0.2434 \times 24,818$ ) to 2,438 ( $=0.1066 \times 22,878$ ). The impacts on total fishing at each site are shown in Table 9-3.

It must be emphasized that all of the impacts in Tables 9-1 and 9-2 are based on the changes in the conditional probabilities evaluated for a single individual with the average characteristics of the entire sample. Although this approach provides a reasonable approximation, greater accuracy could be obtained by evaluating changes in the probabilities for all individuals in the sample because the probability functions are nonlinear and the mean of the probabilities is not identical to the probability evaluated at the mean. The latter approach, however, requires substantially more computation.

#### Angler Expenditures

The reduction in and reallocation of sport fishing trips from closure of the Kenai River to king salmon sport fishing in week 13 also would affect angler spending. Based on the predicted reduction of 696 trips and the reallocation of 45,702 trips to other sport fishing activities, as shown in Table 9-3, it is estimated that total annual spending by resident anglers associated with sport fishing in southcentral Alaska would be reduced from \$74,163,000 to \$74,062,300, a decrease of \$100,700 (0.14 percent). This reduction, which is shown by site in Table

Table 9-2. Choice Probabilities for Salmon Species,  
Type of Fishing, and Number of Fishing Trips With  
and Without Kenai River King Salmon Available

Choice Type	Probability with Kenai River Kings Available	Probability Without Kenai River Kings Available
<u>Salmon Species</u>		
kings	.2434	.1066
reds	.3397	.4011
silvers	.3277	.3861
pinks	.0892	.1054
<u>Type of Fishing</u>		
saltwater	.1042	.1119
salmon	.5349	.5006
fresh water	.2278	.2446
no target	.1332	.1430
<u>Number of Fishing Trips</u>		
0	.7083	.7123
1	.2614	.2581
2	.0269	.0263
3 or more	.0034	.0033

Table 9-3. Proportion of Annual Household Sport Fishing Trips by Site Occurring in Week 13 With and Without Kenai River King Salmon Available

Site	With Kenai River Kings Available		Without Kenai River Kings Available	
	Percent of Annual Trips (%)	Number of Trips	Percent of Annual Trips (%)	Number of Trips
1	0.62	288	0.85	388
2	2.49	1,155	2.69	1,229
3	3.11	1,443	3.70	1,691
4	3.94	1,828	4.05	1,851
5	1.45	673	1.54	704
6	0.62	288	0.66	302
7	4.98	2,311	5.17	2,363
8	0.83	385	0.88	402
9	2.49	1,155	2.81	1,284
10	0.41	190	0.46	210
11	2.70	1,253	2.95	1,348
12	3.53	1,638	3.71	1,696
13	0.62	288	0.67	306
14	3.94	1,828	3.95	1,805
15	3.73	1,731	3.80	1,737
16	10.58	4,909	2.99	1,366
17	7.26	3,368	6.54	2,989
18	4.36	2,023	4.86	2,221
19	3.53	1,638	6.06	2,770
20	3.32	1,540	3.59	1,641
21	3.94	1,828	4.21	1,924
22	2.28	1,058	2.59	1,184
23	6.85	3,178	7.95	3,633
24	6.64	3,081	6.61	3,021
25	1.87	868	2.21	1,010
26	2.28	1,058	2.44	1,115
27	0.21	97	0.42	192
28	8.93	4,143	9.27	4,237
29	2.49	1,155	2.37	1,083
	100.00	46,398	100.00	45,702

9-4, does not, however, reflect possible increases in angler spending in subsequent weeks due to increased sport fishing activity.



Table 9-4. Resident Angler Spending in Week 13 by Site in  
Southcentral Alaska with and without Kenai River  
King Salmon Available (000's of \$)

Site	With Kenai River Kings Available	Without Kenai River Kings Available	Difference
1	\$ 63.8	\$ 86.0	22.2
2	149.5	159.2	9.7
3	349.8	410.0	60.1
4	185.5	187.6	2.1
5	26.2	27.4	1.2
6	12.0	12.5	0.5
7	218.8	223.4	4.6
8	17.1	17.9	0.9
9	46.3	51.5	5.2
10	9.4	10.2	0.9
11	182.7	196.6	13.9
12	245.7	254.4	8.7
13	44.1	46.9	2.8
14	465.9	459.3	-6.5
15	230.3	231.0	0.7
16	739.2	206.0	-533.2
17	583.7	518.1	-65.5
18	304.7	335.7	30.0
19	167.5	283.3	115.7
20	255.3	271.7	16.4
21	202.0	212.4	10.4
22	334.2	373.6	39.4
23	1,097.3	1,256.6	159.3
24	642.1	630.3	-11.8
25	<u>70.9</u>	<u>82.6</u>	<u>11.8</u>
TOTAL	6,644.1	6,543.3	-100.7

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## Appendix A

### SURVEY FORMS



# Nonresident Angler Survey



## SECTION I

### RECENT TRIPS AND FISHING ACTIVITY

1. How many separate trips have members of your household (including yourself) made to Alaska each year since 1983? (For each year, please write in below the total number of trips in column (1) and the number of trips by purpose in columns (2), (3) and (4); for years in which NO trips were taken, please enter a "0" in column (1).)

Remember: A "household member" is anyone who lives in the same house or apartment with you.

Year	(1) TOTAL ALASKAN TRIPS	Alaskan Trips by Purpose		
		(2) Trips without fishing	(3) Trips primarily for fishing	(4) Trips primarily made for other purposes (business, hunting, sightseeing) but fished while there
1986 (to date)				
1985				
1984				
1983				

2. Excluding Alaska, has any member of your household purchased a NONRESIDENT fishing license in any other U.S. State or Canadian province since 1983? (Please circle the appropriate number.)

1 - Yes

2 - No

3 - Don't know

If YES, which states and/or provinces? \_\_\_\_\_

3. Has any member of your household purchased a NONRESIDENT fishing license in any other country since 1983?

1 - Yes

2 - No

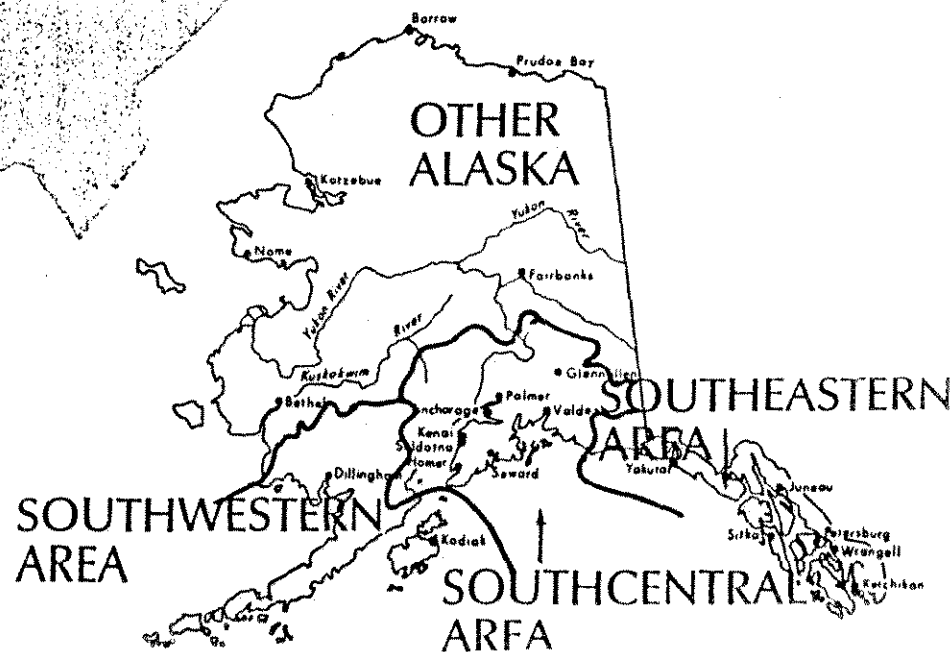
3 - Don't know

If YES, which countries? \_\_\_\_\_

4. Since 1983, how many days have you and/or other members of your household spent fishing in Alaska? (For each year, please write in below the total number of days spent fishing in column (1), and the number of fishing days by location in Alaska in columns (2), (3), (4) and (5). Please refer to the map below and, if necessary, to the more detailed maps enclosed.)

Note: If three members of your household fished on a given day, count that as three "fishing days." Also, please count a partial day of fishing as one "fishing day."

Year	(1) TOTAL ALASKAN FISHING DAYS	Fishing Days by Alaskan Location			
		(2) South- eastern Alaska	(3) South- central Alaska	(4) South- western Alaska	(5) Other Alaska
1986 (to date)					
1985					
1984					
1983					



## SECTION II

### ALASKAN FISHING AREAS

1. Below is a list of fishing areas in different regions of Alaska. These areas are also shown on the enclosed maps. For each of these areas, which one of the following three statements best describe how familiar your household is with the fishing in that area. Please use the following answer code and circle the appropriate number next to each area.

- ANSWER CODE: ① Members of my household have fished there in the past.  
 ② Members of my household have not fished there, but we know about the fishing there.  
 ③ Members of my household don't know about the fishing in the area.

	Have fished there	Have not fished there but know about fishing there	Don't know about the area		Have fished there	Have not fished there but know about fishing there	Don't know about the area		Have fished there	Have not fished there but know about fishing there	Don't know about the area
<b>SOUTHEASTERN ALASKA</b>				<b>SOUTHCENTRAL ALASKA</b>				<b>SOUTHWESTERN ALASKA</b>			
Ketchikan Area (saltwater, including Behm Canal, Tongass Narrows, and Bell Island)	1	2	3	Glennallen Area	1	2	3	Kodiak Area	1	2	3
Ketchikan Area (freshwater)	1	2	3	Prince William Sound Area (including Passage Canal and Valdez Bay)	1	2	3	Naknek Area (including Naknek River and Adak Area)	1	2	3
Prince of Wales Area	1	2	3	Knik Arm Drainage Area (including Little Susitna River and Big Lake)	1	2	3	Kvichak River Drainage Area (including Kvichak River and Lake Iliamna)	1	2	3
Kake / Petersburg / Wrangell / Stikine Area (saltwater, including Blind Slough / Wrangell Narrows)	1	2	3	Anchorage Area	1	2	3	Nushagak Area (including Wood River and Tikchik System)	1	2	3
Kake / Petersburg / Wrangell / Stikine Area (freshwater)	1	2	3	East Side Susitna Drainage Area (including Montana Creek and Willow Creek)	1	2	3				
Sitka Area (saltwater)	1	2	3	Westside Susitna Drainage Area (including Deshka River/ Kroto Creek, Lake Creek, and Alexander Creek)	1	2	3	<b>OTHER ALASKA</b>			
Sitka Area (freshwater)	1	2	3	Kenai Peninsula Area				Fairbanks Area	1	2	3
Juneau Area (saltwater: boat including Doty's Cove)	1	2	3	a) Kenai River (Cook Inlet to Soldotna Bridge)	1	2	3	Lower Yukon/Kuskokwim Area	1	2	3
Juneau Area (saltwater: shoreline)	1	2	3	b) Kenai River (Soldotna Bridge to Moose River)	1	2	3	Seward Peninsula/Norton Sound Area	1	2	3
Juneau Area (freshwater)	1	2	3	c) Kenai River (Moose River to Skilak Outlet)	1	2	3	Northwest Alaska Area	1	2	3
Haines-Skagway Area (saltwater)	1	2	3	d) Kenai River (Skilak Inlet to Kenai Lake)	1	2	3	South Slope Brooks Range Area	1	2	3
Haines-Skagway Area (freshwater)	1	2	3	e) Anchor River	1	2	3	North Slope Brooks Range Area	1	2	3
Glacier Bay Area	1	2	3	f) Ninilchik River	1	2	3				
Yakutat Area	1	2	3	g) Deep Creek (freshwater)	1	2	3				
				h) Russian River	1	2	3				
				i) Kasilof River	1	2	3				
				j) Deep Creek (saltwater)	1	2	3				
				k) Resurrection Bay (Seward)	1	2	3				
				l) Kachemak Bay (Homer)	1	2	3				
				m) Shoreline (Kasilof to Anchor Point: Razor Clams)	1	2	3				
				n) Other shoreline	1	2	3				

## SECTION III

### MOST RECENT TRIP TO ALASKA

1. Have you or any member of your household sportfished in Alaska in the last four years (1983-1986)?

1 - Yes

2 - No

3 - Don't know

If No, or Don't know, skip to Section IV.

The following questions refer to your most recent trip to Alaska in which one or more members of your household sportfished in Alaska. A trip begins when you enter the State of Alaska and ends when you leave the State. As before, a "household member" is anyone who lives in the same house or apartment with you.

2. When was this trip taken?

a. Date (or approximate date) arrived in Alaska \_\_\_\_\_  
(month/day/year)

b. Date (or approximate date) departed from Alaska \_\_\_\_\_  
(month/day/year)

3. How many members of your household (including yourself) went on this trip?  
\_\_\_\_\_ household members

4. Which of the following best describes the primary reason for taking this trip to Alaska? (Circle the one most appropriate number.)

- 1 - Went to Alaska primarily to fish
- 2 - Went to Alaska primarily to hunt—fished while there
- 3 - Went to Alaska primarily on business—fished while there
- 4 - Went to Alaska primarily to visit relatives/friends—fished while there
- 5 - Vacationed in Alaska primarily to do other things—fished while there

5. Did any member of your household conduct any business in Alaska while on this trip?

1 - Yes

2 - No

3 - Don't know

6. Which of the following sources of information were used to plan this trip to Alaska? (Circle as many as apply.)

- 1 - Travel/booking agent
- 2 - Friends/relatives
- 3 - Magazines/books
- 4 - Previous experience
- 5 - Other (please specify) \_\_\_\_\_

7. Which mode(s) of transportation were used to get to Alaska on this trip. (Circle the numbers next to all modes that were used. DO NOT include transportation after you arrived in Alaska.)

1 - Commercial airline

2 - Private airplane

3 - Ferry

4 - Private boat

5 - Cruise ship

6 - Railroad

7 - Camper/RV

8 - Truck

9 - Car

10 - Van

11 - Other

If a boat, plane or ferry was used, what city or place was your first point of entry in Alaska? \_\_\_\_\_

8. How many members of your household (including yourself) fished in Alaska during this trip? \_\_\_\_\_ household members

9. How important were each of the following to members of your household in making your decision about which particular fishing sites to visit on this MOST RECENT trip to Alaska? (Please circle the one most appropriate number next to each site characteristic.)

In deciding what fishing site(s) to visit during your last trip to Alaska . . . . .

	Extremely important	Very important	Somewhat important	Not at all important	Unsure
Availability of a package tour	1	2	3	4	5
Availability of a particular species (e.g., king salmon, rainbow trout)	1	2	3	4	5
Likelihood of catching the desired species	1	2	3	4	5
Likelihood of catching a trophy-sized fish	1	2	3	4	5
Ease of access to site (e.g., road)	1	2	3	4	5
Type of lodging and restaurant facilities available	1	2	3	4	5
Availability of guiding services	1	2	3	4	5
Availability of campground/cabin facilities	1	2	3	4	5
Degree of crowding expected at the fishing sites	1	2	3	4	5

10. In which AREA(S) and at what SITE(S) did members of your household fish during this trip? (Please use the enclosed maps to identify the appropriate AREA CODES (A-Z) and, if needed, to locate your fishing site. Please list the areas/sites in the sequence in which you visited them.)

AREA CODE  
FISHING SITE

EXAMPLES	AREA / SITE 1	AREA / SITE 2	AREA / SITE 3	AREA / SITE 4	AREA / SITE 5	AREA / SITE 6	AREA / SITE 7	AREA / SITE 8	AREA / SITE 9
P P L									
KIRAI RIVER (LOWER) OUT OF HOMER CAMP BELL CR									

Please answer Questions 11 through 16 for EACH fishing site identified in Question 10 above.

11. What MODE(S) OF TRANSPORTATION were used to get to this site from your previous nights stay? (Please use the transportation codes below.)

1,2	2	2									
-----	---	---	--	--	--	--	--	--	--	--	--

12. How many HOUSEHOLD MEMBERS FISHED at this site?

3	3	3									
---	---	---	--	--	--	--	--	--	--	--	--

13. How many DAYS did members of your household SPEND FISHING at this site?

2	1	1									
---	---	---	--	--	--	--	--	--	--	--	--

14. Were GUIDING SERVICES used to fish at this site? (Please answer YES or NO)

YES	YES	NO									
-----	-----	----	--	--	--	--	--	--	--	--	--

15. What was the TARGET SPECIES (i.e., the principal species which members of your household were trying to catch) at this site? (If there were NO target species, skip to Question 16.)

- a. TYPE OF SPECIES, using the species code below.

KS	HA	-									
----	----	---	--	--	--	--	--	--	--	--	--

- b. Approximate number of TARGET SPECIES CAUGHT (including those released) at this site by all members of your household.

2	4	-									
---	---	---	--	--	--	--	--	--	--	--	--

16. What OTHER SPECIES were caught at this site by any member of your household? (If NO other species were caught, skip to Question 17.)

- a. TYPE OF SPECIES, using the species code below.

-	RF	RT									
---	----	----	--	--	--	--	--	--	--	--	--

- b. Approximate number of OTHER SPECIES CAUGHT (including those released) at this site by all members of your household.

-	2	2									
---	---	---	--	--	--	--	--	--	--	--	--

#### TRANSPORTATION CODES:

- 1 = Airplane
- 2 = Car
- 3 = Boat
- 4 = Ferry
- 5 = Camper/RV
- 6 = Truck/Van
- 7 = Railroad
- 8 = Other

#### SPECIES CODES:

- KS = King Salmon (also known as Chinook Salmon)
- KI = Small King Salmon (also known as Jack Salmon)
- RS = Red Salmon (also known as Sockeye Salmon)
- SS = Silver Salmon (also known as Coho Salmon)
- PS = Pink Salmon (also known as Humpback Salmon)
- CS = Chum Salmon (also known as Dog Salmon)
- LL = Land-Locked Salmon
- SH = Steelhead Trout

- RT = Rainbow Trout
- CT = Cutthroat Trout
- BT = Brook Trout
- LT = Lake Trout
- DV = Dolly Varden
- AC = Arctic Char
- NP = Northern Pike
- GR = Arctic Grayling
- SF = Sheefish

- WF = Whitefish
- BB = Burbot
- SM = Smelt/Hooligan/Capelin
- RF = Rockfish/Sea Bass
- HA = Halibut
- OF = Other Fin Fish Species
- RC = Razor Clams
- OS = Other Shell Fish

If more than 9 sites were visited, how many sites in total were visited during this trip? \_\_\_\_\_ total sites

17. Did your household take home (out of Alaska) any fish that your household caught in Alaska on this most recent trip? 1 - Yes 2 - No 3 - Don't know

18. If your household purchased a package fishing tour for this trip, what services did it include? (Circle all numbers that apply.)

1 - Airplane services

3 - Boat services

5 - Lodging

7 - Fishing gear and equipment

2 - Guiding services

4 - Other transportation

6 - Meals

8 - Fish processing/packaging

19. If all your transportation costs were NOT part of a package deal, how much did your household spend on transportation to and from Alaska for this trip? (If this trip was part of a business trip, please write N/A.) \$ \_\_\_\_\_

20. Thinking about your household's total fishing-related expenditures made IN ALASKA on this trip, approximately how much did members of your household spend in each of the following types of businesses, and how much of these expenditures were made in the following locations:

Type of Business	APPROX. TOTAL AMOUNT SPENT FOR THIS TRIP	Where Money Was Spent			
		Anchorage Area	Kenai Penin.	Juneau Area	Other Alaska
Department/variety stores	\$	\$	\$	\$	\$
Sporting goods stores	\$	\$	\$	\$	\$
Air taxi operators	\$	\$	\$	\$	\$
Fishing camps and lodges	\$	\$	\$	\$	\$
Travel businesses (e.g., commercial airlines, travel agents, car rental)	\$	\$	\$	\$	\$
Guide businesses	\$	\$	\$	\$	\$
Trailer parks and campgrounds	\$	\$	\$	\$	\$
Hotels/motels	\$	\$	\$	\$	\$
Grocery stores	\$	\$	\$	\$	\$
Restaurants	\$	\$	\$	\$	\$
Gas stations	\$	\$	\$	\$	\$
Other types of businesses	\$	\$	\$	\$	\$

21. How satisfied was your household with its Alaskan fishing experience on this trip?

Very satisfied  
1

Satisfied  
2

Unsure  
3

Unsatisfied  
4

Very unsatisfied  
5

Don't know  
6

22. How likely would your household be to come back to Alaska within the next 3 years to go fishing?

Very likely  
1

Likely  
2

Unsure  
3

Unlikely  
4

Very unlikely  
5

Don't know  
6

23. What if the roundtrip transportation cost to Alaska had been \$150 more per person, would you still have taken this trip?

Definitely yes  
1

Yes  
2

Uncertain  
3

No  
4

Definitely no  
5

If the transportation cost had been \$300 more per person for this trip?

Definitely yes  
1

Yes  
2

Uncertain  
3

No  
4

Definitely no  
5

If the transportation cost had been \$600 more per person for this trip?

Definitely yes  
1

Yes  
2

Uncertain  
3

No  
4

Definitely no  
5

## SECTION IV

### HOUSEHOLD FISHING/DEMOGRAPHIC INFORMATION

1. Does any member of your household subscribe to a sportfishing magazine?

1 - Yes

2 - No

3 - Don't know

If YES which one(s)? \_\_\_\_\_

2. Overall, how would you rate the fishing skills of the most experienced angler in your household who has fished in Alaska? (Please circle one.)

Novice  
1

Intermediate  
2

Advanced  
3

Expert  
4

Can't Say  
5

The following information is needed for statistical purposes only and will be kept strictly confidential.

3. What is the highest level of education any member of your household has completed?

1 - Less than 8th grade

5 - Technical/secretarial school

2 - 8th grade

6 - Some college

3 - Some high school

7 - College degree

4 - High school graduate

8 - Post graduate study

4. Which one of the following best describes your personal employment status?

1 - Annually employed by someone else

5 - Unemployed and looking for work

2 - Seasonally employed by someone else

6 - Unemployed and not looking for work

3 - Self employed

7 - Retired

4 - Homemaker

8 - Other

5. Which category best describes your household's 1985 income before taxes?

1 - Less than \$5,000

6 - \$30,000-39,999

11 - \$80,000-89,999

2 - \$5,000-9,999

7 - \$40,000-49,999

12 - \$90,000-99,999

3 - \$10,000-14,999

8 - \$50,000-59,999

13 - \$100,000-200,000

4 - \$15,000-19,999

9 - \$60,000-69,999

14 - \$200,000-500,000

5 - \$20,000-29,999

10 - \$70,000-79,999

15 - Over \$500,000

## SECTION V

### ALASKA SPORTFISHING IMPROVEMENTS / OTHER COMMENTS

#### Improving Alaskan Sportfishing

We are interested in ways in which you think the Alaskan sportfishing experience could be improved. Suggestions which are specific will be more useful than those which are very general. Feel free to offer several suggestions.

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#### Other Comments

Please provide any other comments below.

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THANK YOU FOR YOUR ASSISTANCE

## MAILING INSTRUCTIONS / ENTRY BLANK

Thank you for completing this survey. To return this questionnaire, please fold along the fold marks on the back and affix the adhesive strip. Return postage is guaranteed.

If you would like to enter the prize drawing, fill out the information below. Upon checking for completeness of the questionnaire, this page will be detached from the survey and your name entered in the drawing. This will ensure confidentiality of your response.

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_







# Resident Angler Survey

## ALASKAN ANGLER SURVEY CARD

1. How many members of your household\* (including yourself) are:
  - 1) 18 years of age and under \_\_\_\_\_
  - 2) over 18 \_\_\_\_\_

\* (A "household member" includes anyone who lives in the same house or apartment with you.)
2. How many years has your household lived in Alaska? \_\_\_\_\_ years.
3. Did any member of your household fish – including ice fishing – in Alaska during any of the three preceding years (1983, 1984 or 1985)? (Please circle the appropriate number)
 

1 - Yes    2 - No    3 - Not sure

If YES, approximately how many fishing trips were taken in each year? (Please check the appropriate category for each year.)

	Number of Fishing Trips				
	None	1-4	5-10	11-20	over 20
1983	_____	_____	_____	_____	_____
1984	_____	_____	_____	_____	_____
1985	_____	_____	_____	_____	_____

\*(A "fishing trip" is defined as lasting from the time you left your home until you returned home.)
4. Did any member of your household do any ice fishing during this past winter (November through March)?
 

1 - Yes    2 - No    3 - Not sure
5. Does any member of your household expect to fish in Alaska between April and September of 1986?
 

1 - Yes    2 - No    3 - Not sure

If YES, roughly how many fishing trips in total do these members expect to take?

\_\_\_\_\_ 1-4 trips    \_\_\_\_\_ 5-10 trips

\_\_\_\_\_ 11-20 trips    \_\_\_\_\_ over 20 trips
6. If any member of your household fished in 1983, 1984, or 1985 but does not expect to fish in 1986, which reason(s) best describes why they do not expect to fish this year (Please circle the number of all appropriate categories)
  - 1 - will not be in Alaska during the fishing season
  - 2 - will be too busy to fish this year
  - 3 - fishing experience in previous year was bad
  - 4 - want to use the money for other things this year
7. What is the name of the household member (16 years or older) most likely to fish in 1986?

First Name \_\_\_\_\_

Last Name \_\_\_\_\_

Questionnaire I (QI)

# ALASKAN ANGLER SURVEY

## SECTION I

### HOUSEHOLD FISHING EXPERIENCE

1. For each member of your household (including yourself) please write down the approximate age, sex, and the number of years of fishing experience in Alaska.

Example—if there are three members of the household—a 27-year-old male with 11 years of fishing experience in Alaska, a 24-year-old female who has never fished in Alaska, and a 5-year-old female with no fishing experience—fill out the first three rows like this:

Approximate Age	Sex (M or F)	Number of Years Fishing Experience in Alaska
27	M	11
24	F	0
5	F	0

Fill in here for your household, putting yourself first:

	Approximate Age	Sex (M or F)	Number of Years Fishing Experience in Alaska
Yourself	_____	_____	_____
Member 2	_____	_____	_____
Member 3	_____	_____	_____
Member 4	_____	_____	_____
Member 5	_____	_____	_____
Member 6	_____	_____	_____
Member 7	_____	_____	_____
Member 8	_____	_____	_____
Member 9	_____	_____	_____
Member 10	_____	_____	_____

2. Below are some statements about fishing activity in Alaska. How well does each statement apply to your household? (Please circle the number that best describes how you agree or disagree with the statement.)

	Definitely Agree	Agree	No Opinion	Disagree	Definitely Disagree	Don't Know
a. Over the years, we have fished at many different places in Alaska.	1	2	3	4	5	6
b. We have a good idea which are the best fishing places in Alaska.	1	2	3	4	5	6
c. We are still looking for new places to fish in Alaska.	1	2	3	4	5	6
d. We usually fish in the same places from one year to another.	1	2	3	4	5	6

3. There are different things that people look for when deciding where to go fishing. Some of these are listed below. Overall, how desirable is each one to your household?

In deciding where to fish...

	Very Desirable	Desirable	No Opinion	Undesirable	Very Undesirable	Don't Know
a. Good chance to catch trophy-sized fish	1	2	3	4	5	6
b. Good chance to catch your limit	1	2	3	4	5	6
c. A wilderness area	1	2	3	4	5	6
d. A site of exceptional beauty	1	2	3	4	5	6
e. A site limited to fly fishing	1	2	3	4	5	6
f. A site with few other fishermen around	1	2	3	4	5	6
g. Not having to negotiate rapids or powerful currents	1	2	3	4	5	6
h. Not having to travel for a long time to the site	1	2	3	4	5	6
i. Site with fly-in access	1	2	3	4	5	6
j. Site with good boat access	1	2	3	4	5	6
k. Site with maintained road access	1	2	3	4	5	6

4. How well do the following statements apply to your household?

	Definitely Yes	Yes	Sometimes	No	Definitely No	Don't Know
a. When we go on a fishing trip in the summer, we usually first choose what species we want to fish for and then choose a site where that species is available.	1	2	3	4	5	6
b. When we go on a fishing trip in the summer, we usually first choose a site that we like and then fish for whatever species is available.	1	2	3	4	5	6
c. We usually go to a site near where we or friends own land or a cabin.	1	2	3	4	5	6
d. We usually go out of our way to avoid sites crowded with other fishermen.	1	2	3	4	5	6
e. We usually do catch-and-release fishing.	1	2	3	4	5	6
f. We usually take guided fishing trips.	1	2	3	4	5	6
g. We usually take float fishing trips.	1	2	3	4	5	6

5. How well does each of the following statements fit your household's situation this summer?

	Always	Usually	Sometimes	Seldom	Never	Don't Know
a. We have to work on weekdays during the summer.	1	2	3	4	5	6
b. We can take time off on the weekdays to go fishing.	1	2	3	4	5	6
c. We go fishing after work.	1	2	3	4	5	6
d. On weekends, we are busy with activities other than fishing.	1	2	3	4	5	6
e. When we go fishing it means giving up some possible income.	1	2	3	4	5	6
f. If we had more free time, we would take many more fishing trips.	1	2	3	4	5	6

6. Does any member of your household subscribe to a sportsfishing or outdoor magazine?

1 - Yes

2 - No

3 - Don't know

If Yes, which one(s)?

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7. Overall, how would you rate the fishing skills of the most experienced angler in your household?

1 - Novice

3 - Advanced

2 - Intermediate

4 - Expert

5 - Can't say

8. Does any member of your household hold an airplane pilot's license?

1 - Yes

2 - No

3 - Don't know

9. Is any member of your household a hunter?

1 - Yes

2 - No

3 - Don't know

If Yes, would you say that, overall, this member(s) of your household:

1 - Hunts occasionally

2 - Hunts quite a bit

3 - Hunts very frequently

10. Does any member of your household belong to a fishing club/organization, a flying club/organization, a hunting club/organization, and/or an environmental association?

Fishing club/organization

1 - Yes

2 - No

3 - Don't know

Flying club/organization

1 - Yes

2 - No

3 - Don't know

Hunting club/organization

1 - Yes

2 - No

3 - Don't know

Environmental association

1 - Yes

2 - No

3 - Don't know

11. Below is a list of many fishing areas/sites in different regions of Alaska. These sites are also shown on the maps on the inside cover. For each of these sites, which of the following statements best describes your household's situation. Please use the following answer code and circle the appropriate number for each area/site.

ANSWER CODE: (1) Members of my household go there often to fish. (2) Members of my household go there occasionally to fish, or might go there in the near future. (3) Members of my household don't know the area, or never go there to fish.

SOUTHCENTRAL ALASKA				SOUTHCENTRAL ALASKA				SOUTHWESTERN ALASKA			
	OFTEN	SELDOM	NEVER		OFTEN	SELDOM	NEVER		OFTEN	SELDOM	NEVER
<b>Glennallen Area</b>				<b>West Side Susitna Drainage Area</b>				<b>Kodiak Area</b>			
Gulkana River (Paxson-Sourdough)	1	2	3	Deshka River-Kroto Creek	1	2	3	Freshwater sites	1	2	3
Gulkana River (Sourdough-Highway)	1	2	3	Lake Creek	1	2	3	Saltwater sites	1	2	3
Gulkana River (Other)	1	2	3	Alexander Creek	1	2	3	<b>Naknek Area</b>			
Tyone, Susitna, Louise Lakes	1	2	3	Talachulitna River	1	2	3	Naknek River	1	2	3
Other freshwater sites	1	2	3	Chuitna River	1	2	3	Other freshwater sites	1	2	3
<b>Prince William Sound</b>				Theodore, Lewis, and Ivan Rivers	1	2	3	Saltwater sites	1	2	3
Valdez Bay	1	2	3	Other freshwater sites	1	2	3	<b>Kvichak River Drainage Area</b>			
Passage Canal (Whittier)	1	2	3	Saltwater sites	1	2	3	Lake Iliamna and tributaries	1	2	3
Other saltwater sites	1	2	3					Other freshwater sites	1	2	3
Freshwater sites	1	2	3	<b>Kenai Peninsula Area</b>				<b>Nushagak Area</b>			
<b>Knik Arm Drainage Area</b>				Kenai River (Cook Inlet to				Wood River/Tikchik System	1	2	3
Little Susitna River	1	2	3	Soldotna Bridge)	1	2	3	Other freshwater sites	1	2	3
Knik River	1	2	3	Kenai River (Soldotna Bridge to				Saltwater sites	1	2	3
Wasilla and Cottonwood Creeks	1	2	3	Moose River)	1	2	3	<b>SOUTHEASTERN ALASKA</b>			
Big Lake	1	2	3	Kenai River (Moose River to				Ketchikan Area	1	2	3
Kepler Complex	1	2	3	Skilak Outlet)	1	2	3	Prince of Wales Area	1	2	3
Finger Lake	1	2	3	Kenai River (Skilak Inlet to				Kake/Petersburg/Wrangell/			
Wasilla Lake	1	2	3	Kenai Lake)	1	2	3	Stikine Area	1	2	3
Other freshwater sites	1	2	3	Skilak Lake	1	2	3	Sitka Area	1	2	3
Saltwater sites	1	2	3	Kenai Lake	1	2	3	Juneau Area	1	2	3
<b>Anchorage Area</b>				Russian River	1	2	3	Haines-Skagway Area	1	2	3
Anchorage Area Lakes	1	2	3	Kasilof River	1	2	3	Glacier Bay Area	1	2	3
Bird Creek	1	2	3	Ninilchik River	1	2	3	Yakutat Area	1	2	3
Campbell Creek	1	2	3	Anchor River	1	2	3	<b>OTHER ALASKA</b>			
Twentymile River	1	2	3	Deep Creek (freshwater)	1	2	3	Fairbanks Area	1	2	3
Other freshwater sites	1	2	3	Other freshwater sites	1	2	3	Lower Yukon/Kuskokwim Area	1	2	3
Saltwater sites	1	2	3	Deep Creek (saltwater)	1	2	3	Seward Peninsula/Norton			
<b>East Side Susitna Drainage Area</b>				Kachemak Bay (Homer)	1	2	3	Sound Area	1	2	3
Clear Creek	1	2	3	Resurrection Bay (Seward)	1	2	3	Northwest Alaska Area	1	2	3
Montana Creek	1	2	3	Shoreline (Kasilof to Anchor Point:				South Slope Brooks Range Area	1	2	3
Caswell Creek	1	2	3	Razor Clams)	1	2	3	North Slope Brooks Range Area	1	2	3
Willow Creek/Little Willow Creek	1	2	3	Other shoreline sites	1	2	3				
Other freshwater sites	1	2	3	Other saltwater sites	1	2	3				

12. Does any member of your household own or have regular access to a privately-owned cabin in Alaska? 1 - Yes 2 - No

If Yes, please list the area/site(s) FROM ABOVE which are nearest to the cabin:

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## SECTION II WINTER FISHING IN ALASKA

1. Did any members of your household (including yourself) go fishing in Alaska during this past winter—between November 1, 1985 and April 30, 1986?  
(Note: This includes ice fishing trips.)

- 1 - Yes  
2 - No  
3 - Don't know

If No, or Don't know, skip to Section III.

2. How many members of your household (including yourself) participated in some fishing in Alaska between November 1, 1985, and April 30, 1986?  
\_\_\_\_\_ household members

3. Please list each lake (or stream) where anyone in your household (including yourself) went fishing during this time period. If the site is unnamed, please identify the area. Also, please identify the number of trips, the number of person-days (each day a household member fishes at a site is one person-day), and the total number of fish caught by household members at each of these sites.

Example: Members of the household visited two sites during the winter. Two trips were made to Jewel Lake and one trip was made to an unnamed lake in the Knik Arm Area. On one of the trips to Jewel Lake, one household member went and on the other trip two household members went. Each trip to Jewel Lake was a one day trip, so a total of three "person-days" were spent at Jewel Lake. Three members of the household went to the unnamed lake and spent 2 days there. This is 6 person-days (3 x 2).

Examples:

<u>Site name/area</u>	<u>Approx. number of trips</u>	<u>Approx. person-days at site</u>	<u>Approx. total number fish caught</u>
Jewel Lake	2	3	10
Unnamed lake/Knik Arm Area	1	6	15

Please fill in below:

<u>Site name/area</u>	<u>Approx. number of trips</u>	<u>Approx. person-days at site</u>	<u>Approx. total number fish caught</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

4. Approximately how much money did members of your household (including yourself) spend on fishing between November 1, 1985 and April 30, 1986 for:

a. Equipment/tackle	\$ _____
b. Gasoline/other travel expenses	\$ _____
c. Food/lodging	\$ _____
d. Other	\$ _____
<b>TOTAL AMOUNT SPENT</b>	<b>\$ _____</b>



## SECTION III

### 1986 SUMMER FISHING IN ALASKA - MAY, JUNE AND JULY

In this section, we need some specific information about your household's fishing trips in Alaska during MAY, JUNE and JULY.

If NO fishing trips were taken during these months, Skip to Section IV.

This section is in three parts:

- A Calendar for recording the DATES during MAY, JUNE and JULY in which members of your household fished.
- A Trip Log for recording information about the NUMBER OF PERSONS, SITES VISITED, CATCH and CROWDING CONDITIONS on each trip.
- A Site Record for recording some INFORMATION ABOUT TRAVEL to the sites that members of your household visited and TYPICAL EXPENDITURES associated with these visits.

### Calendars 1986

#### Calendar Instructions:

1. DRAW A LINE in each day of the calendar in which you or any other member of your household went fishing in Alaska. If the trip lasted one or more nights, continue the line for each day of the trip.
2. NUMBER EACH TRIP separately by writing the trip number above the line and circling it.

EXAMPLE: Members of the Bass household took three fishing trips between May and July. All three trips were taken in July including a DAY TRIP on July 1, a 3-DAY TRIP on July 4, 5 and 6, and an OVERNIGHT TRIP on July 11. Only the July calendar would be filled out and it would be completed as follows:

SUN	MON	TUE	WED	THUR	FRI	SAT
		1 ①	2	3	4 ②	5
6	7	8	9	10	11 ③	12

				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

SUN	MON	TUE	WED	THUR	FRI	SAT
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Area Code	Name of Area/Site	Area Code	Name of Area/Site
<b>SOUTHCENTRAL ALASKA</b>		<b>Kenai Peninsula Area (Cont'd)</b>	
	<b>Glennallen Area</b>	P-4	Kenai River (Skilak Inlet to Kenai Lake)
I-1	Gulkana River (Paxson-Sourdough)	P-5	Skilak Lake
I-2	Gulkana River (Sourdough-Highway)	P-6	Kenai Lake
I-3	Gulkana River (Other)	P-7	Russian River
I-4	Tyone, Susitna, Louise Lakes	P-8	Kasilof River
I-5	Other freshwater sites*	P-9	Ninichik River
	<b>Prince William Sound</b>	P-10	Anchor River
J-1	Valdez Bay	P-11	Deep Creek (freshwater)
J-2	Passage Canal (Whittier)	P-12	Other freshwater sites*
J-3	Other saltwater sites*	P-13	Deep Creek (saltwater)
J-4	Freshwater sites*	P-14	Kachemak Bay (Homer)
	<b>Knik Arm Drainage Area</b>	P-15	Resurrection Bay (Seward)
K-1	Cliffie Susitna River	P-16	Shoreline (Kasilof to Anchor Point: Razor Clams)
K-2	Knik River	P-17	Other shoreline sites*
K-3	Wasilla and Cottonwood Creeks	P-18	Other saltwater sites*
K-4	Big Lake		
K-5	Kepler Complex	<b>SOUTHWESTERN ALASKA</b>	
K-6	Finger Lake		
K-7	Wasilla Lake	Q-1	Kodiak Area
K-8	Other freshwater sites*	Q-2	Freshwater sites*
K-9	Saltwater sites*		
	<b>Anchorage Area</b>	R-1	Naknek River
L-1	Anchorage Area Lakes	R-2	Other freshwater sites*
L-2	Bird Creek	R-3	Saltwater sites*
L-3	Campbell Creek		
L-4	Twentymile River		
L-5	Other freshwater sites*	S-1	<b>Kvichak River Drainage Area</b>
L-6	Saltwater sites*	S-2	Lake Iliamna and tributaries
	<b>East Side Susitna Drainage Area</b>		Other freshwater sites*
M-1	Clear Creek		
M-2	Montana Creek		
M-3	Caswell Creek		
M-4	Willow Creek/Little Willow Creek		
M-5	Other freshwater sites*		
	<b>SOUTHCENTRAL ALASKA</b>		
	<b>West Side Susitna Drainage Area</b>		
N-1	Deshka River-Kroto Creek		
N-2	Lake Creek		
N-3	Alexander Creek		
N-4	Talachulitna River		
N-5	Chitina River		
N-6	Theodore, Lewis, and Ivan Rivers		
N-7	Other freshwater sites*		
N-8	Saltwater sites*		
	<b>Kenai Peninsula Area</b>		
P-1	Kenai River (Cook Inlet to Soldotna Bridge)		
P-2	Kenai River (Soldotna Bridge to Moose River)		
P-3	Kenai River (Moose River to Skilak Outlet)		

\*In addition to site codes, please specify site.



\* An additional TRIP LOG is provided on page 9.

Write in trip # (from calendar) here

1. What was the **DAY** and **APPROXIMATE TIME** of **DEPARTURE** on this trip?
2. What was the **DAY** and **APPROXIMATE TIME** of **RETURN** on this trip?
3. What was the **primary MEANS OF TRANSPORTATION** used on this trip? (use the **Transportation Codes** listed below.)
4. How many **HOUSEHOLD MEMBERS** went on the trip (include yourself and other household members who went along but did not fish? **Do not include people who went along but were NOT household members.**
5. How many **HOUSEHOLD MEMBERS** (including yourself) actually **FISHED** on this trip?

Please answer Questions 6 thru 11 for EACH site visited on a trip; if more than 1 site was visited on any trip, use an additional column for each site and begin the next trip in the next "completely blank" column (see Example - Trip #2)

6. At what SITE(S) did members of your household fish on this trip? Please use the Site Code listed on the "flap" above. (These site codes are needed because some sites have similar names.) If more than one site was visited on any trip, please separately list each site visited on that trip, as shown in the example (Trip #2).
7. At this site, where did members of your household FISH? FISH Bank Only = "1", Boat/Floating Platform Only = "2", Both Bank and Boat/Floating Platform = "3".
8. What was the approximate number of HOURS SPENT FISHING at this site by members of your household during this trip.....
9. What was the TARGET SPECIES (i.e., the principal species which members of your household were trying to catch) at this site on this trip? (If there was NO "Target Species," skip to Question 10.)
  - a. TYPE OF SPECIES using the Species Code below.
  - b. Approximate number of TARGET SPECIES CAUGHT at this site by all members of your household. If none were caught, please write "0".
10. What OTHER SPECIES were caught at this site by all members of your household? (If no other species were caught, skip to Question 11.)
  - a. TYPE OF SPECIES using the Species Code below.
  - b. Approximate number of OTHER SPECIES CAUGHT by all members of your household.
11. What was the degree of CROWDING on this occasion at this site? Very Crowded = "1"; Somewhat Crowded = "2"; Not Crowded = "3"; Wilderness Conditions = "4"; Unsure = "5".

**TRANSPORTATION CODES:**

- 1 = just walked/bicycle    4 = truck/van    7 = other boat  
2 = motor bike/ATV    5 = camper/recreation vehicle    8 = airplane  
3 = car    6 = motor boat    9 = other

**SPECIES CODE:**

- |                        |                    |                         |                      |                    |                      |                             |                             |                       |
|------------------------|--------------------|-------------------------|----------------------|--------------------|----------------------|-----------------------------|-----------------------------|-----------------------|
| KS - King Salmon       | SS - Silver Salmon | LL - Land-Locked Salmon | CT - Cutthroat Trout | DV - Dolly Varden  | GR - Arctic Grayling | BB - Burbot                 | HA - Halibut                | QS - Other Shell Fish |
| RI - Small King Salmon | P5 - Pink Salmon   | ST - Steelhead Trout    | BT - Brook Trout     | AC - Arctic Char   | SF - Sheefish        | SM - Smelt/Hoodlcan/Capelin | QF - Other Fin Fish Species |                       |
| RS - Red Salmon        | C5 - Chum Salmon   | RT - Rainbow Trout      | LT - Lake Trout *    | NO - Northern Pike | WF - Whitefish       | RF - Rockfish/Sage Bass     | RC - Razor Clams            |                       |

# Site Record

INSTRUCTIONS: Fill out ONE column in the Site Record below for each site that appears in the Trip Log. If a site was visited more than once, fill out only ONE record for this site. Write the Site Code number at the head of the column.

EXAMPLE: Members of your household visited K-1 twice and N-2 once between May and July. Fill out ONE record for site K-1 and ONE record for site N-2.

	EXAMPLE	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6	SITE 7	SITE 8	SITE 9	SITE 10
SITE VISITED (please use site codes)	K-1	N-2									
1. What was the approximate ONE-WAY DISTANCE of this site from your home, in miles?	70	20									
2. Where did members of your household USUALLY STAY at this site? If they usually did not stay overnight, please write N/A; otherwise please use the OVERNIGHT ACCOMMODATIONS CODE below.	2	N/A									

3. What were the approximate TRIP EXPENDITURES made by all members of your household in visiting this site? If there was more than one trip to the site, please estimate the average per trip or per day (as indicated below) cost for all trips to the site. IF THERE WERE NO EXPENDITURES IN ONE OR MORE OF THESE CATEGORIES, PLEASE PUT "0" IN THE SPACE. Your best estimate is needed for the following types of expenditures:

a. TRANSPORTATION EXPENSES to and from the site, per trip. The total transportation expenses for all the household members who went to the site, including:

	EXAMPLE	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6	SITE 7	SITE 8	SITE 9	SITE 10
Motor vehicle expenses (e.g., gasoline, oil, parking, etc.)	\$20	\$10									
Airplane expenses (e.g., airline tickets, plane rental, fuel, landing fees, etc.)	\$0	\$0									
Boat expenses (e.g., gasoline, oil, etc.)	\$0	\$0									
Other expenses (e.g., bus or train tickets)	\$0	\$0									

b. ON-SITE FISHING EXPENSES, per day. The total on-site fishing expenses per day for all the household members who went fishing at the site, including:

	EXAMPLE	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6	SITE 7	SITE 8	SITE 9	SITE 10
Consumable tackle (e.g., fishing line, lures, etc.) and bait	\$15	\$15									
On-site boating costs (e.g., gasoline, oil, rental fees, dock fees)	\$5	\$5									
Guide fees	\$0	\$0									

c. FOOD, BEVERAGES, AND LODGING EXPENSES, per day. The average expenditures per day for food and lodging enroute to the site and at the site, including:

	EXAMPLE	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6	SITE 7	SITE 8	SITE 9	SITE 10
Food and beverages, including alcoholic beverages - (if food and beverages were included with lodging, put all expenditures in the "lodging" category.)	\$30	\$10									
Lodging (e.g., lodges, hotels, motels, campgrounds, etc.)	\$0	\$0									

## OVERNIGHT ACCOMMODATIONS CODE:

1 = cabin/residence owned by household or friends  
2 = camper/RV  
3 = commercial lodge

5 = hotel, motel, or rented cabin  
6 = commercial campground  
7 = state, federal, or other improved campground

8 = unimproved campground  
9 = boat  
10 = other

Example: The Bass household

1	2	3
7/1 7AM	7/4 8AM	7/11 3PM
7/1 8PM	7/6 6PM	7/12 7PM

3	5	3
---	---	---

2	4	1
---	---	---

1	2	1
---	---	---

P-9	P-10	P-12 STARISK CR.	P-14
-----	------	------------------	------

1	3	1	2
---	---	---	---

4	12	5	7
---	----	---	---

SS	PS	DV	
0	2	1	

RT	SH		HA
1	2		1

2	1	3	4
---	---	---	---

NOTE: 2 sites were visited on Trip #2, so 2 columns are used to answer Questions 6 through 11. Trip #3 starts in the next COMPLETELY BLANK column.

## SECTION IV DEMOGRAPHIC INFORMATION

The following information is needed for statistical purposes and will be kept strictly confidential. (Please circle:)

1. Which one of the following best describes your personal employment status?

- 1 - Annually employed by someone else    5 - Unemployed and looking for work  
2 - Seasonally employed by someone else    6 - Unemployed and not looking for work  
3 - Self employed    7 - Retired  
4 - Homemaker    8 - Other

2. Which category best describes your household's 1985 income before taxes?

- |                       |                      |                        |
|-----------------------|----------------------|------------------------|
| 1 - Less than \$5,000 | 6 - \$30,000-39,999  | 11 - \$80,000-89,999   |
| 2 - \$5,000-9,999     | 7 - \$40,000-49,999  | 12 - \$90,000-99,999   |
| 3 - \$10,000-14,999   | 8 - \$50,000-59,999  | 13 - \$100,000-200,000 |
| 4 - \$15,000-19,999   | 9 - \$60,000-69,999  | 14 - \$200,000-500,000 |
| 5 - \$20,000-29,999   | 10 - \$70,000-79,999 | 15 - Over \$500,000    |

3. What is the highest level of education any member of your household has completed?

- |                          |                                  |
|--------------------------|----------------------------------|
| 1 - Less than 8th grade  | 5 - Technical/secretarial school |
| 2 - 8th grade            | 6 - Some college                 |
| 3 - Some high school     | 7 - College degree               |
| 4 - High school graduate | 8 - Post graduate study          |

4. What is the longest any member of your household has been a resident of Alaska?  
\_\_\_\_\_ years

5. In what ways do you feel sportfishing in Alaska could be improved?

(Recommendations which are specific will be more useful than those which are general.)

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# Trip Log (Con't)

Write in Trip # (from calendar) here

- What was the DAY and APPROXIMATE TIME of DEPARTURE on this trip?
- What was the DAY and APPROXIMATE TIME of RETURN on this trip?
- What was the primary MEANS OF TRANSPORTATION used on this trip (use the Transportation Codes listed below.)
- How many HOUSEHOLD MEMBERS went on the trip (include yourself and other household members who went along but did not fish)? Do not include people who went along but were NOT household members.
- How many HOUSEHOLD MEMBERS (including yourself) actually FISHED on this trip?

Please answer Questions 6 thru 11 for EACH site visited on a trip; if more than 1 site was visited on any trip, use an additional column for each site and begin the next trip in the next "completely blank" column (see Example - Trip #2).

- At what SITE(S) did members of your household fish on this trip? Please use the Site Codes listed on the "flap" on page 5. (These site codes are needed because some sites have similar names.) If more than one site was visited on any trip, please separately list each site visited on that trip, as shown in the example on page 6 (Trip #2).
- At this site, where did members of your household FISH FROM? Bank Only = "1"; Boat/Floatplane Only = "2"; Both Bank and Boat/Floatplane = "3".
- What was the approximate number of HOURS SPENT FISHING at this site by members of your household during this trip?
- What was the TARGET SPECIES (i.e., the principal species which members of your household were trying to catch) at this site on this trip? (If there was NO "Target Species," skip to Question 10.)
  - TYPE OF SPECIES using the Species Code below.
  - Approximate number of TARGET SPECIES CAUGHT at this site by all members of your household. If none were caught, please write "0".
- What OTHER SPECIES were caught at this site by all members of your household? (If no other species were caught, skip to Question 11.)
  - TYPE OF SPECIES using the Species Code below.
  - Approximate number of OTHER SPECIES CAUGHT by all members of your household.
- What was the degree of CROWDING on this occasion at this site? Very Crowded = "1"; Somewhat Crowded = "2"; Not Crowded = "3"; Wilderness Conditions = "4"; Unsure = "5"

## TRANSPORTATION CODES:

- |                               |                |
|-------------------------------|----------------|
| 1 = just walked/bicycle       | 6 = motor boat |
| 2 = motor bike/ATV            | 7 = other boat |
| 3 = car                       | 8 = airplane   |
| 4 = truck/van                 | 9 = other      |
| 5 = camper/recreation vehicle |                |

## SPECIES CODE:

- |                        |                         |                    |                             |                             |
|------------------------|-------------------------|--------------------|-----------------------------|-----------------------------|
| KS - King Salmon       | CS - Chum Salmon        | BT - Brook Trout   | CR - Arctic Grayling        | RF - Rockfish/Sea Bass      |
| KI - Small King Salmon | LL - Land-Locked Salmon | LT - Lake Trout    | SF - Sheefish               | HA - Halibut                |
| RS - Red Salmon        | SH - Steelhead Trout    | DV - Dolly Varden  | WF - Whitefish              | OF - Other Fin Fish Species |
| SS - Silver Salmon     | RT - Rainbow Trout      | AC - Arctic Char   | BB - Burbot                 | RC - Razor Clams            |
| PS - Pink Salmon       | CT - Cutthroat Trout    | NO - Northern Pike | SM - Smelt/Hooligan/Capelin | OS - Other Shell Fish       |

## MAILING INSTRUCTIONS / ENTRY BLANK

Thank you for completing this survey. To return this questionnaire, please fold along the fold marks on the back and affix the adhesive strip. Return postage is guaranteed.

If you would like to enter the prize drawing, fill out the information below. Upon checking for completeness of the questionnaire, this page will be detached from the survey and your name entered in the drawing. This will ensure confidentiality of your response.

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



Questionnaire II (QII)

# ALASKAN ANGLER SURVEY

PART 2

# SECTION I 1986 SUMMER FISHING IN ALASKA - AUGUST AND SEPTEMBER

1. Did any member of your household sport fish during August or September of this year? (please circle)

1 - Yes    2 - No                         If NO fishing trips were taken during these months, skip to Section II.

2. Below is a list of fishing areas/sites in different regions of Alaska. Please circle the Site Codes preceding each area/site in which a member of your household fished during August or September of this year.

Site Code	Name of Area/Site	Site Code	Name of Area/Site
<b>SOUTHCENTRAL ALASKA</b>			
	Glennallen Area	P-3	Kenai Peninsula Area (Cont'd)
I-1	Gulkana River (Passon-Sourdough)		Kenai River (Moose River to Skilak Outlet)
I-2	Gulkana River (Sourdough-Highway)	P-4	Kenai River (Skilak Inlet to Kenai Lake)
I-3	Gulkana River (Other)	P-5	Skilak Lake
I-4	Lyone, Susitna, Louise Lakes	P-6	Kenai Lake
I-5	Other freshwater sites	P-7	Russian River
	Prince William Sound	P-8	Kasilof River
I-1	Valdez Bay	P-9	Ninilchik River
I-2	Passage Canal (Whittier)	P-10	Anchor River
I-3	Other saltwater sites	P-11	Deep Creek (freshwater)
I-4	Other freshwater sites	P-12	Other freshwater sites
	Knik Arm Drainage Area	P-13	Deep Creek (saltwater)
K-1	Little Susitna River	P-14	Kachemak Bay (Homer)
K-2	Knik River	P-15	Resurrection Bay (Seward)
K-3	Wasilla and Cottonwood Creeks	P-16	Shoreline (Kasilof to Anchor Point: Razor Clams)
K-4	Big Lake	P-17	Other shoreline sites
K-5	Kepler Complex	P-18	Other saltwater sites
K-6	Finger Lake		<b>SOUTHWESTERN ALASKA</b>
K-7	Wasilla Lake		Kodiak Area
K-8	Other freshwater sites	Q-1	Freshwater sites
K-9	Other saltwater sites	Q-2	Saltwater sites
	Anchorage Area		Naknek Area
I-1	Anchorage Area Lakes	R-1	Naknek River
I-2	Bird Creek	R-2	Other freshwater sites
I-3	Campbell Creek	R-3	Saltwater sites
I-4	Twentymile River		Kvichak River Drainage Area
I-5	Other freshwater sites	S-1	Lake Ilanina and Induljaras
I-6	Other saltwater sites	S-2	Other freshwater sites
	East Side Susitna Drainage Area		Nushagak Area
M-1	Clear Creek	I-1	Woon River/Taktik System
M-2	Mountain Creek	I-2	Other freshwater sites
M-3	Casswell Creek	I-3	Saltwater sites
M-4	Willow Creek/Little Willow Creek		<b>SOUTHEASTERN ALASKA</b>
M-5	Other freshwater sites		A Ketchikan Area
	<b>SOUTHCENTRAL ALASKA</b>		B Prince of Wales Area
N-1	West Side Susitna Drainage Area		C Kake/Petersburg/Wrangell/Stikine Area
N-2	Deshka River-Kruto Creek		D Sitka Area
N-3	Lake Creek		E Juneau Area
N-4	Alexander Creek	E-1	Saltwater sites
N-5	Tahabultra River	E-2	Freshwater sites
N-6	Chudina River	F	Haines-Skagway Area
N-7	Thesofre, Lewis, and Ivan Rivers	G	Glacier Bay Area
N-8	Other freshwater sites	H	Yakutat Area
	Saltwater sites		<b>OTHER ALASKA</b>
	Kenai Peninsula Area	U	Fairbanks Area
P-1	Kenai River (Cook Inlet to Seldotna Bridge)	V	Lower Yukon/Kuskokwim Area
P-2	Kenai River (Seldotna Bridge to Moose River)	W	Seward Peninsula/Norton Sound Area
		X	Northwest Alaska Area
		Y	South Slope Brooks Range Area
		Z	North Slope Brooks Range Area

3. On the calendars below:

- a. DRAW A LINE in each day in which you or any other member of your household went fishing in Alaska. If the trip lasted one or more nights, continue the line for each day of the trip; and
- b. NUMBER EACH TRIP separately by writing the trip number above the line and circling it. EXAMPLE: Members of the Bass household took 2 trips during August and September. Both trips were taken in September, including a DAY TRIP on September 3 and a 3-DAY TRIP on September 5, 6 and 7. Only the September calendar would be filled out and it would be completed as follows:

SUN	MON	TUES	WED	THURS	FRI	SAT
	1	2	3 ①	4	5	6 ②
7	8	9	10	11	12	13

	SUN	MON	TUES	WED	THURS	FRI	SAT
						1	2
3	4	5	6	7	8	9	
10	11	12	13	14	15	16	
17	18	19	20	21	22	23	
24	25	26	27	28	29	30	
31							

	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

**Trip Log** Trip Log Instructions: For EACH trip identified on the Calendar, please provide your best estimate of the information requested in Questions 4 through 14. If more than one site was visited on any trip, please use a separate column (as shown for Trip #2 in the example below) for EACH site visited on that trip WHEN COMPLETING QUESTIONS 9 THROUGH 14.

EXAMPLE: The Bass household

Write in Trip # (from calendar) here

4. What was the DAY and APPROXIMATE TIME of DEPARTURE on this trip?

day approx. time

9/3 9/5  
8am 6pm

5. What was the DAY and APPROXIMATE TIME of RETURN on this trip?

day approx. time

9/3 9/4  
6pm 8pm

6. What was the primary MODE OF TRANSPORTATION used on this trip? (use the transportation codes listed below.)

3 5

7. How many HOUSEHOLD MEMBERS went on this trip (include yourself and other household members who went along but did not fish? Exclude adults people who went along but were NOT household members.

2 4

8. How many HOUSEHOLD MEMBERS (including yourself) actually FISHED on this trip?

1 2

Please answer Questions 9 thru 14 for EACH site visited on a trip; if more than 1 site was visited on any trip, use an additional column for each site and begin the next trip in the next "completely blank" column (see Example - Trip #2).

9. At what SITE(s) did members of your household fish on this trip? Please use the site codes listed above. (If these site codes are needed because some sites have similar names, if more than one site was visited on any trip, please list in a separate column each site visited on that trip, as shown in the example Trip #2).

K5 P1 P14

10. At this site, where did members of your household FISH? (Bank Only = "1"; Boat/Kayak/Plane Only = "2"; Both Bank and Boat/Kayak/Plane = "3").

2 3 2

11. What was the approximate number of HOURS SPENT FISHING at this site by members of your household during this trip?

6 8 5

12. What was the TARGET SPECIES (i.e., the principal species which members of your household were trying to catch) at this site on this trip? (If there was NOT "Target Species," skip to Question 13.)

a. TYPE OF SPECIES using the Species Code below.

GR SS HA

b. Approximate number of TARGET SPECIES CAUGHT at this site by all members of your household. If none were caught, please write "0".

1 2

13. What OTHER SPECIES were caught at this site by all members of your household? (If no other species were caught, skip to Question 14.)

a. TYPE OF SPECIES using the Species Code below.

LL RT RF

b. Approximate number of OTHER SPECIES CAUGHT by all members of your household.

1 3 2

14. What was the degree of CROWDING on this occasion at this site? Very Crowded = "1"; Somewhat Crowded = "2"; Not Crowded = "3"; Wilderness Conditions = "4"; Unsure = "5".

2 1 3

#### TRANSPORTATION CODES:

1 = just walked/bicycle 4 = truck/van  
2 = motor bike/ATV 5 = camper/recreation vehicle  
3 = car 6 = motor boat 7 = other boat  
8 = airplane 9 = other

#### SPECIES CODE:

KS - King Salmon SS - Silver Salmon LL - Land-Locked Salmon CT - Cutthroat Trout DV - Dolly Varden GR - Arctic Grayling BB - Burbot HA - Halibut  
KI - Small King Salmon PS - Pink Salmon SH - Steelhead Trout AC - Arctic Char SM - Smelt/Hoodigan/Capelin OF - Other Fin Fish Species  
RS - Red Salmon CS - Chum Salmon RT - Rainbow Trout LT - Lake Trout NO - Northern Pike WF - Whitefish RF - Rockfish/Sea Bass RC - Razor Clams  
OS - Other Shell Fish



## Site Record

**INSTRUCTIONS:** Fill out ONE column in the Site Record below for each separate site that appears in the Trip Log. If a site was visited more than once, fill out only ONE record for this site. Write the Site Code number at the head of the column.

Members of your household visited K-1 twice and N-2 once during August and September. Fill out ONE record for site K-1 and ONE record for site N-2.

	EXAMPLE	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6	SITE 7	SITE 8	SITE 9	SITE 10
SITE VISITED (please use site codes)	K-1 N-2										
1. What was the approximate ONE-WAY DISTANCE of this site from your home, in miles?	70 20										
2. Where did members of your household USUALLY STAY at this site? If they usually did not stay overnight, please write N/A; otherwise please use the OVERNIGHT ACCOMMODATIONS CODE below.	2 N/A										

3. What were the approximate TRIP EXPENDITURES made by all members of your household in visiting this site? If there was more than one trip to the site, please estimate the average per trip or per day (as indicated below) cost for all trips to the site. IF THERE WERE NO EXPENDITURES IN ONE OR MORE OF THESE CATEGORIES, PLEASE PUT "0" IN THE SPACE. Your best estimate is needed for the following types of expenditures:

a. **TRANSPORTATION EXPENSES** to and from the site, per trip. The total transportation expenses for all the household members who went to the site, including:

Motor vehicle expenses (e.g., gasoline, oil, parking, etc.)

Airplane expenses (e.g., airline tickets, plane rental, fuel, landing fees, etc.)

Boat expenses (e.g., gasoline, oil, etc.)

Other expenses (e.g., bus or train tickets)

\$ 20	\$ 10	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
\$ 0	\$ 0	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
\$ 0	\$ 0										
\$ 0	\$ 0	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$

b. **ON-SITE FISHING EXPENSES**, per day. The total on-site fishing expenses per day for all the household members who went fishing at the site, including:

Consumable tackle (e.g., fishing line, lures, etc.) and bait

On-site boating costs (e.g., gasoline, oil, rental fees, dock fees)

Guide fees

\$ 15	\$ 15	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
\$ 5	\$ 5	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
\$ 0	\$ 0	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$

c. **FOOD, BEVERAGES, AND LODGING EXPENSES**, per day. The average expenditures per day for food and lodging enroute to the site and at the site, including:

Food and beverages, including alcoholic beverages - (If food and beverages were included with lodging, put all expenditures in the "lodging category.")

Lodging (e.g., lodges, hotels, motels, campgrounds, etc.)

\$ 30	\$ 10	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
\$ 0	\$ 0	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$

### OVERNIGHT ACCOMMODATIONS CODE:

1 = cabin/residence owned by household or friends

2 = camper/RV

3 = commercial lodge

5 = hotel, motel, or rented cabin

6 = commercial campground

7 = state, federal, or other improved campground

8 = unimproved campground

9 = boat

10 = other

Version A  
SECTION II

FISHING-RELATED EQUIPMENT OWNERSHIP AND EXPENDITURES

1. Which of the following items does your household own (including part ownership)? (Please circle as many as apply.)

GROUP A		GROUP B			
01 - plane	05 - snow machine	08 - tent/sleeping bags	12 - fishing rod/poles	16 - fish freezer	20 - books on Alaskan fishing
02 - boat	06 - ATV	09 - tackle (reels, lures, spinners, etc.)	13 - dip net	17 - backpacks	
03 - cabin	07 - improved campsites	10 - trolling equipment	14 - sonar/fish finders	18 - campstove	
04 - camper/RV		11 - ice fishing equipment	15 - fish smoker/processor	19 - waders/hipboots	

If your household owns any item(s) in GROUP A above (e.g., plane, ATV, etc.), please give a brief description, the year bought, the approximate cost when bought, and the percentage of use which is related to fishing:

Description of Item In Group A		Year Bought	Approx. Cost When Bought	Percentage of Use Related to Fishing
EXAMPLES: 30 FT. BOAT		1975	\$ 20,000	100 %
TWIN ENGINE PLANE		1978	\$ 75,000	15 %
CABIN		1972	\$ 15,000	60 %
			\$ _____	_____ %
			\$ _____	_____ %
			\$ _____	_____ %
			\$ _____	_____ %
			\$ _____	_____ %
			\$ _____	_____ %
			\$ _____	_____ %
			\$ _____	_____ %
			\$ _____	_____ %

2. Thinking about your household's total fishing-related expenditures made over the past year (Oct. 1985 - Sept. 1986) what was the approximate amount of money spent in the following categories. Also, please ESTIMATE as best you can how much was spent in the locations identified below.

Fishing-related Expenditures	APPROXIMATE TOTAL AMOUNT OF PURCHASES (Oct. 1985-Sept. 1986)	Where the money was spent				
		Anchorage Area	Kenai Penin.	Juneau Area	Fairbanks & Other AK	Outside AK
EXAMPLE: Food and beverages	\$ 350	\$ 200	\$ 100	\$ _____	\$ 50	\$ _____
Food and beverages	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Hotels/lodges/campgrounds	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Cabin/campsite improvements	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Tackle/gear/clothing	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Equipment rental	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Fish processing	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Licenses	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Guide/access fees	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Motor vehicle-related expenses	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Boat-related expenses	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Plane-related expenses	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Insurance	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Package fishing trips	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Other expenses	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____

Version B  
SECTION II

FISHING-RELATED EQUIPMENT OWNERSHIP AND EXPENDITURES

1. Which of the following items does your household own (including part ownership)? (Please circle as many as apply.)

GROUP A

01 - plane  
02 - boat  
03 - cabin  
04 - camper/RV  
05 - snow machine  
06 - ATV  
07 - improved campsites

GROUP B

08 - tent/sleeping bag  
09 - tackle (reels, lures, spinners, etc.)  
10 - trolling equipment  
11 - ice fishing equipment  
12 - fishing rod/poles  
13 - dip net  
14 - sonar/fish finders  
15 - fish smoker/processor  
16 - fish freezer  
17 - backpacks  
18 - campstove  
19 - waders/hipboots  
20 - books on Alaskan fishing

If your household owns any item(s) in GROUP A above (e.g., plane, ATV, etc.), please give a brief description, the year bought, the approximate cost when bought, and the percentage of use which is related to fishing:

EXAMPLES:	Description of Item In Group A	Year Bought	Approx. Cost When Bought	Percentage of Use Related to Fishing
	30 FT. BOAT	1975	\$ 20,000	100 %
	TWIN ENGINE PLANE	1978	\$ 75,000	15 %
	CABIN	1972	\$ 15,000	60 %
			\$	%
			\$	%
			\$	%
			\$	%
			\$	%
			\$	%
			\$	%
			\$	%

2. Thinking about your HOUSEHOLD'S total fishing-related expenditures IN ALASKA made over the past year (Oct. 1985 - Sept. 1986), what is the approximate amount of money spent in each of the following types of businesses. Also, please estimate as best you can how much was spent in the different Alaskan locations below.

Type of Business in Alaska	APPROXIMATE TOTAL AMOUNT OF PURCHASES (Oct. 1985-Sept. 1986)	Where the money was spent			
		Anchorage Area	Kenai Penin.	Juneau Area	Fairbanks & Other AK
EXAMPLE: Restaurants	\$ 350	\$ 200	\$ 100	\$	\$ 50
Department/sporting good stores	\$	\$	\$	\$	\$
Lodging places	\$	\$	\$	\$	\$
Mail order catalogues	\$	\$	\$	\$	\$
Retail food and liquor stores	\$	\$	\$	\$	\$
Restaurants	\$	\$	\$	\$	\$
Service stations	\$	\$	\$	\$	\$
Transportation (e.g. air taxi operators, travel agencies, air lines, etc.) not including guide business	\$	\$	\$	\$	\$
Guide businesses	\$	\$	\$	\$	\$
Fish packing/processing businesses	\$	\$	\$	\$	\$
Marine boats and accessory stores	\$	\$	\$	\$	\$
Other businesses	\$	\$	\$	\$	\$

## SECTION III

### SPORT FISHING FOR KING SALMON ON THE KENAI RIVER

Currently, an Alaskan resident with a valid fishing license can fish on the Kenai River on any day it is open to king salmon fishing and keep up to five Kenai kings over the entire year (with a limit of one per day)—there is no limit on the number caught and released. At present there is no charge for Kenai king salmon kept. If these same rules are maintained, and thinking ahead to next year:

What is the approximate number of days you expect to fish for Kenai king salmon next year? (Put 0 if none; if uncertain, please give best guess.)

about \_\_\_\_\_ days

If your fishing goes as planned, how many Kenai king salmon do you expect to catch and keep next year? (Put 0 if none; if uncertain, please give best guess.)

about \_\_\_\_\_ Kenai kings

Some people in the last survey suggested that one way to improve conditions on the Kenai River would be to start charging a fee for catching and keeping Kenai king salmon (using the money collected to improve the king salmon fishery). Please tell us what you would do in the following three situations:

#### Situation 1

Suppose that when you purchased your fishing license at the beginning of the season you had to get a Kenai king salmon stamp which allowed you to catch and keep a specified maximum number of Kenai kings. If the fees for the stamps, which allow different numbers of kings to be kept, cost the following amount (in addition to the standard Alaskan resident fishing license fee) which one would you buy?

#### Choose one option

- ☐ No Extra Fee/Maximum 1 Kenai king allowed to be kept
- ☐ \$10/Maximum 2 Kenai kings allowed to be kept
- ☐ \$25/Maximum 3 Kenai kings allowed to be kept
- ☐ \$50/Maximum 5 Kenai kings allowed to be kept
- ☐ \$250/Maximum 10 Kenai kings allowed to be kept
- ☐ Would not fish for Kenai kings so no stamp needed

#### Situation 2

Here is a different situation. Now assume that special Kenai king salmon stamps cost the amounts listed below. Given the alternatives, which one would you buy?

#### Types of King Salmon Stamps (choose one)

- ☐ \$10/Maximum 1 Kenai king allowed
- ☐ \$50/Maximum 2 Kenai king allowed
- ☐ \$100/Maximum 3 Kenai king allowed
- ☐ \$500/Maximum 5 Kenai king allowed
- ☐ \$5,000/Maximum 10 Kenai king allowed
- ☐ Would not fish for Kenai kings so no stamp needed

#### Situation 3

Now we would like your opinion on what the Kenai king salmon stamps should cost Alaskan residents. Please indicate below how much you think the fee should be for each type of stamp. (Feel free to put in zero if you think there should be no special Kenai king salmon stamp and write in NOT ALLOWED if you think that no one should be permitted to catch and keep that number of Kenai kings.)

#### Stamp Would Allow

#### Fee Should Be

Maximum of 1 Kenai king to be kept	\$ _____
Maximum of 2 Kenai king to be kept	\$ _____
Maximum of 3 Kenai king to be kept	\$ _____
Maximum of 5 Kenai king to be kept	\$ _____
Maximum of 10 Kenai king to be kept	\$ _____

If this set of stamp fees was put into effect next year, which one would you obtain?

- ☐ Stamp allowing a maximum of 1 Kenai king to be kept
- ☐ Stamp allowing a maximum of 2 Kenai king to be kept
- ☐ Stamp allowing a maximum of 3 Kenai king to be kept
- ☐ Stamp allowing a maximum of 5 Kenai king to be kept
- ☐ Stamp allowing a maximum of 10 Kenai king to be kept

## MAILING INSTRUCTIONS / ENTRY BLANK

Thank you for completing this survey. To return this questionnaire, please fold along the fold marks on the back and affix the adhesive strip. Return postage is guaranteed.


If you would like to enter the prize drawing, fill out the information below. Upon checking for completeness of the questionnaire, this page will be detached from the survey and your name entered in the drawing. This will ensure confidentiality of your response.

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



Combination Questionnaire (Combo)

# ALASKAN ANGLER SURVEY



## SECTION I HOUSEHOLD FISHING EXPERIENCE

1. For each member of your household (including yourself) please write down the approximate age, sex, and the number of years of fishing experience in Alaska.

Example: if there are three members of the household—a 27-year-old male with 11 years of fishing experience in Alaska, a 24-year-old female who has never fished in Alaska, and a 5-year-old female with no fishing experience—fill out the first three rows like this:

Approximate Age	Sex (M or F)	Number of Years Fishing Experience in Alaska
27	M	11
24	F	0
5	F	0

Fill in here for your household, putting yourself first:

	Approximate Age	Sex (M or F)	Number of Years Fishing Experience in Alaska
Yourself	_____	_____	_____
Member 2	_____	_____	_____
Member 3	_____	_____	_____
Member 4	_____	_____	_____
Member 5	_____	_____	_____
Member 6	_____	_____	_____
Member 7	_____	_____	_____
Member 8	_____	_____	_____
Member 9	_____	_____	_____
Member 10	_____	_____	_____

2. Below are some statements about fishing activity in Alaska. How well does each statement apply to your household? (Please circle the number that best describes how you agree or disagree with the statement.)

	Definitely Agree	Agree	No Opinion	Disagree	Definitely Disagree	Don't Know
a. Over the years, we have fished at many different places in Alaska.	1	2	3	4	5	6
b. We have a good idea which are the best fishing places in Alaska.	1	2	3	4	5	6
c. We are still looking for new places to fish in Alaska.	1	2	3	4	5	6
d. We usually fish in the same places from one year to another.	1	2	3	4	5	6

3. There are different things that people look for when deciding where to go fishing. Some of these are listed below. Overall, how desirable is each one to your household?

In deciding where to fish...

	Very Desirable	Desirable	No Opinion	Undesirable	Very Undesirable	Don't Know
a. Good chance to catch trophy-sized fish	1	2	3	4	5	6
b. Good chance to catch your limit	1	2	3	4	5	6
c. A wilderness area	1	2	3	4	5	6
d. A site of exceptional beauty	1	2	3	4	5	6
e. A site limited to fly fishing	1	2	3	4	5	6
f. A site with few other fishermen around	1	2	3	4	5	6
g. Not having to negotiate rapids or powerful currents	1	2	3	4	5	6
h. Not having to travel for a long time to the site	1	2	3	4	5	6
i. Site with fly-in access	1	2	3	4	5	6
j. Site with good boat access	1	2	3	4	5	6
k. Site with maintained road access	1	2	3	4	5	6

4. How well do the following statements apply to your household?

	Definitely Yes	Yes	Sometimes	No	Definitely No	Don't Know
a. When we go on a fishing trip in the summer, we usually first choose what species we want to fish for and then choose a site where that species is available.	1	2	3	4	5	6
b. When we go on a fishing trip in the summer, we usually first choose a site that we like and then fish for whatever species is available.	1	2	3	4	5	6
c. We usually go to a site near where we or friends own land or a cabin.	1	2	3	4	5	6
d. We usually go out of our way to avoid sites crowded with other fishermen.	1	2	3	4	5	6
e. We usually do catch-and-release fishing.	1	2	3	4	5	6
f. We usually take guided fishing trips.	1	2	3	4	5	6
g. We usually take float fishing trips.	1	2	3	4	5	6

5. How well does each of the following statements fit your household's situation this summer?

	Always	Usually	Sometimes	Seldom	Never	Don't know
a. We have to work on weekdays during the summer.	1	2	3	4	5	6
b. We can take time off on the weekdays to go fishing.	1	2	3	4	5	6
c. We go fishing after work.	1	2	3	4	5	6
d. On weekends, we are busy with activities other than fishing.	1	2	3	4	5	6
e. When we go fishing it means giving up some possible income.	1	2	3	4	5	6
f. If we had more free time, we would take many more fishing trips.	1	2	3	4	5	6

6. Does any member of your household subscribe to a sportsfishing or outdoor magazine?

- 1 - Yes  
2 - No  
3 - Don't know

If Yes, which one(s)?

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7. Overall, how would you rate the fishing skills of the most experienced angler in your household?

- 1 - Novice                      3 - Advanced  
2 - Intermediate            4 - Expert  
5 - Can't say

8. Does any member of your household hold an airplane pilot's license?

- 1 - Yes  
2 - No  
3 - Don't know

9. Is any member of your household a hunter?

- 1 - Yes  
2 - No  
3 - Don't know

If Yes, would you say that, overall, this member(s) of your household:

- 1 - Hunts occasionally  
2 - Hunts quite a bit  
3 - Hunts very frequently

10. Does any member of your household belong to a fishing club/organization, a flying club/organization, a hunting club/organization, and/or an environmental association?

Fishing club/organization	1 - Yes	2 - No	3 - Don't know
Flying club/organization	1 - Yes	2 - No	3 - Don't know
Hunting club/organization	1 - Yes	2 - No	3 - Don't know
Environmental association	1 - Yes	2 - No	3 - Don't know



## SECTION II

### 1986 SUMMER FISHING IN ALASKA - MAY THROUGH SEPTEMBER

1. Did any member of your household sport fish in Alaska between May and September of this year? (please circle)

1 - Yes 2 - No

If NO fishing trips were taken during these months, skip to Section III.

2. Below is a list of fishing areas/sites in different regions of Alaska. (These sites are shown on the maps on the inside cover.) Please circle the Site Codes preceding each area/site in which a member of your household fished between May and September of this year.

Site Code	Name of Area/Site	Site Code	Name of Area/Site
<b>SOUTHCENTRAL ALASKA</b>			
I-1	Glennallen Area	P-3	Kenai Peninsula Area (Cont'd)
I-2	Gulkana River (Passon-Sourdough)	P-4	Kenai River (Moose River to Skilak Outlet)
I-3	Gulkana River (Sourdough-Highway)	P-5	Kenai River (Skilak Inlet to Kenai Lake)
I-4	Gulkana River (Other)	P-6	Skilak Lake
I-5	Byone, Susitna, Louisa Lakes	P-7	Kenai Lake
	Other freshwater sites	P-8	Russian River
	Prince William Sound	P-9	Kasilof River
J-1	Valdez Bay	P-10	Ninichik River
J-2	Passage Canal (Whittier)	P-11	Anchor River
J-3	Other saltwater sites	P-12	Deep Creek (freshwater)
J-4	Freshwater sites	P-13	Other freshwater sites
K-1	Knik Arm Drainage Area	P-14	Deep Creek (saltwater)
K-2	Little Susitna River	P-15	Kachemak Bay (Homer)
K-3	Knik River	P-16	Resurrection Bay (Seward)
K-4	Wayila and Cottonwood Creeks	P-17	Shoreline (Kasilof to Anchor Point: Razor Clams)
K-5	Big Lake	P-18	Other shoreline sites
K-6	Kepler Complex		Other saltwater sites
K-7	Finger Lake	<b>SOUTHWESTERN ALASKA</b>	
K-8	Wasilla Lake	Q-1	Kodiak Area
K-9	Other freshwater sites	Q-2	Freshwater sites
	Saltwater sites		Saltwater sites
L-1	Anchorage Area	R-1	Naknek Area
L-2	Anchorage Area Lakes	R-2	Naknek River
L-3	Bird Creek	R-3	Other freshwater sites
L-4	Campbell Creek		Saltwater sites
L-5	Twentymile River	S-1	Kvichak River Drainage Area
L-6	Other freshwater sites	S-2	Lake Iliamna and tributaries
	Saltwater sites		Other freshwater sites
M-1	East Side Susitna Drainage Area		Nushagak Area
M-2	Clear Creek	T-1	Wood River/Tikchik System
M-3	Montana Creek	T-2	Other freshwater sites
M-4	Casswell Creek	T-3	Other freshwater sites
M-5	Willow Creek/Little Willow Creek		Saltwater sites
	Other freshwater sites	<b>SOUTHEASTERN ALASKA</b>	
		A	Ketchikan Area
		B	Prince of Wales Area
		C	Kake/Petersburg/Wrangell
		D	Sitka Area
N-1	West Side Susitna Drainage Area	E-1	Sitka Area
N-2	Deshka River-Kruto Creek	E-2	Juneau Area
N-3	Lake Creek	F	Saltwater sites
N-4	Alexander Creek	G	Saltwater sites
N-5	Talar Susitna River	H	Haines-Skagway Area
N-6	Chusina River		Glacier Bay Area
N-7	Theodore, Lewis, and Ivan Rivers		Yakutat Area
N-8	Other freshwater sites	<b>OTHER ALASKA</b>	
	Saltwater sites	U	Fairbanks Area
P-1	Kenai Peninsula Area	V	Lower Yukon/Kuskokwim Area
P-2	Kenai River (Moose River to Seldovia Bridge)	W	Seward Peninsula/Norton Sound Area
	Kenai River (Seldovia Bridge to Moose River)	X	Northwest Alaska Area
		Y	South Slope Brooks Range Area
		Z	North Slope Brooks Range Area

3. Does any member of your household own or have regular access to a privately-owned cabin in Alaska?

1 - Yes 2 - No

If Yes, please list the area/site(s) FROM QUESTION 2 which are nearest to the cabin: \_\_\_\_\_

4. On the calendars below:

a. DRAW A LINE in each day in which you or any other member of your household went fishing in Alaska. If the trip lasted one or more nights, continue the line for each day of the trip; and

b. NUMBER EACH TRIP separately by writing the trip number above the line and circling it.

EXAMPLE: Members of the Bass household took 2 trips between May and September. Both trips were taken in September, including a DAY TRIP on September 3 and a 3-DAY TRIP on September 5, 6 and 7. Only the September calendar would be filled out and it would be completed as follows: ■

SUN	MON	TUES	WED	THURS	FRI	SAT
	1	2	3 <u>1</u>	4	5 <u>2</u>	6
7	8	9	10	11	12	13

SUN	MON	TUES	WED	THURS	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					
1	2	3	4	5		
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

SUN	MON	TUES	WED	THURS	FRI	SAT
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						
1	2	3	4	5	6	
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

# Trip Log

INSTRUCTIONS: For EACH trip identified on the Calendars above, please provide your best estimate of the information requested in Questions 5 through 15. If more than one site was visited on any trip, please use a separate column (as shown for Trip #2 in the example below) for EACH site visited on that trip WHEN COMPLETING QUESTIONS 10 THROUGH 15.

EXAMPLE: The Bass household

\*An additional TRIP LOG is provided on page 9.\*

Write in Trip # (from calendar) here:

5. What was the DAY and APPROXIMATE TIME of DEPARTURE on this trip?

6. What was the DAY and APPROXIMATE TIME of RETURN on this trip?

7. What was the primary MEANS OF TRANSPORTATION used on this trip (use the transportation codes listed below)?

8. How many HOUSEHOLD MEMBERS went on the trip (include yourself and other household members who went along but did not fish! Do not include people who went along but were NOT household members.)

9. How many HOUSEHOLD MEMBERS (including yourself) actually FISHED on this trip?

Fill in answer Questions 10 through 15 for EACH site visited on a trip; if more than 1 site was visited on any trip, use an additional column for each site and begin the next trip in the next "completely blank" column (see Example - Trip #2).

10. At what SITE(s) did members of your household fish on this trip? Please use the Site Codes listed above. (These site codes are provided because some sites have similar names; if more than one site was visited on any trip, please list in a separate column each site visited on that trip, as shown in the example (Trip #2)).

11. At this site, where did members of your household FISH FROM? Bank Only = "1"; Boat/Footplane Only = "2"; Both Bank and Boat/Footplane = "3".

12. What was the approximate number of HOURS SPENT FISHING at this site by members of your household during this trip?

13. What was the TARGET SPECIES i.e., the principal species which members of your household were trying to catch at this site on this trip? (If there was NO "Target Species," skip to Question 14.)

a. TYPE OF SPECIES using the Species Code below.

b. Approximate number of TARGET SPECIES CAUGHT at this site by all members of your household. If none were caught, please write "0".

14. What OTHER SPECIES were caught at this site by all members of your household? (If no other species were caught, skip to Question 15.)

a. TYPE OF SPECIES using the Species Code below.

b. Approximate number of OTHER SPECIES CAUGHT by all members of your household.

15. What was the degree of CROWDING on this or any other at this site? Very Crowded = "1"; Somewhat Crowded = "2"; Not Crowded = "3"; Wilderness Conditions = "4"; Unsure = "5".

## TRANSPORTATION CODES:

1 = just walked/bicycle 4 = truck/van  
2 = motor bike/ATV 5 = camper/recreation vehicle  
3 = car 6 = motor boat  
7 = other boat 8 = airplane  
9 = other

## SPECIES CODES:

KS - King Salmon SS - Silver Salmon SH - Land-Locked Salmon CT - Cutthroat Trout DV - Dolly Varden GR - Arctic Grayling BB - Burbot HA - Halibut  
KI - Small King Salmon PS - Pink Salmon SI - Steelhead Trout AC - Arctic Char SM - Smelt/Hoodigan/Capelin OF - Other Fin Fish Species  
RS - Red Salmon CS - Chum Salmon RT - Rainbow Trout LT - Lake Trout NO - Northern Pike WI - Whitefish RI - Rockfish/Sea Bass RC - Razor Clams  
OS - Other Shell Fish

# Site Record

**INSTRUCTIONS:** Fill out ONE column in the Site Record below for each separate site that appears in the Trip Log. If a site was visited more than once, fill out only ONE record for this site. Write the Site Code number at the head of the column.

**EXAMPLE:** Members of your household visited K-1 twice and N-2 once between May and September. Fill out ONE record for site K-1 and ONE record for site N-2.

	EXAMPLE	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6	SITE 7	SITE 8	SITE 9	SITE 10
SITE VISITED (please use site codes)	K-1   N-2										
1. What was the approximate ONE-WAY DISTANCE of this site from your home, in miles?	70   20										
2. Where did members of your household USUALLY STAY at this site? If they usually did not stay overnight, please write N/A; otherwise please use the OVERNIGHT ACCOMMODATIONS CODE below.	2   N/A										

3. What were the approximate TRIP EXPENDITURES made by all members of your household in visiting this site? If there was more than one trip to the site, please estimate the average per trip or per day (as indicated below) cost for all trips to the site. IF THERE WERE NO EXPENDITURES IN ONE OR MORE OF THESE CATEGORIES, PLEASE PUT "0" IN THE SPACE. Your best estimate is needed for the following types of expenditures:

a. **TRANSPORTATION EXPENSES** to and from the site, per trip. The total transportation expenses for all the household members who went to the site, including:

Motor vehicle expenses (e.g., gasoline, oil, parking, etc.)

Airplane expenses (e.g., airline tickets, plane rental, fuel, landing fees, etc.)

Boat expenses (e.g., gasoline, oil, etc.)

Other expenses (e.g., bus or train tickets)

\$ 20   \$ 10	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
\$ 0   \$ 0	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
\$ 0   \$ 0	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
\$ 0   \$ 0	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$

b. **ON-SITE FISHING EXPENSES**, per day. The total on-site fishing expenses per day for all the household members who went fishing at the site, including:

Consumable tackle (e.g., fishing line, lures, etc.) and bait

On-site boating costs (e.g., gasoline, oil, rental fees, dock fees)

Guide fees

\$ 15   \$ 15	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
\$ 5   \$ 5	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
\$ 0   \$ 0	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$

c. **FOOD, BEVERAGES, AND LODGING EXPENSES**, per day. The average expenditures per day for food and lodging enroute to the site and at the site, including:

Food and beverages, including alcoholic beverages - (If food and beverages were included with lodging, put all expenditures in the "lodging category.")

Lodging (e.g., lodges, hotels, motels, campgrounds, etc.)

\$ 30   \$ 10	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
\$ 0   \$ 0	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$

## OVERNIGHT ACCOMMODATIONS CODE:

- 1 = cabin/residence owned by household or friends
- 2 = camper/RV
- 3 = commercial lodge

- 5 = hotel, motel, or rented cabin
- 6 = commercial campground
- 7 = state, federal, or other improved campground

- 8 = unimproved campground
- 9 = boat
- 10 = other

## FISHING-RELATED EQUIPMENT OWNERSHIP AND EXPENDITURES

- 

If your household owns any item(s) in GROUP A above (e.g., plane, ATV, etc.), please give a brief description, the year bought, the approximate cost when bought, and the percentage of use which is related to fishing:

**EXAMPLES:**

- 2.

6

## SECTION V

### SPORT FISHING FOR KING SALMON ON THE KENAI RIVER

Currently, an Alaskan resident with a valid fishing license can fish on the Kenai River on any day it is open to king salmon fishing and keep up to five Kenai kings over the entire year (with a limit of one per day)—there is no limit on the number caught and released. At present there is no charge for Kenai king salmon kept. If these same rules are maintained, and thinking ahead to next year:

What is the approximate number of days you expect to fish for Kenai king salmon next year? (Put 0 if none; if uncertain, please give best guess.)

about \_\_\_\_\_ days

If your fishing goes as planned, how many Kenai king salmon do you expect to catch and keep next year? (Put 0 if none; if uncertain, please give best guess.)

about \_\_\_\_\_ Kenai kings

Some people in the last survey suggested that one way to improve conditions on the Kenai River would be to start charging a fee for catching and keeping Kenai king salmon (using the money collected to improve the king salmon fishery). Please tell us what you would do in the following three situations:

#### Situation 1

Suppose that when you purchased your fishing license at the beginning of the season you had to get a Kenai king salmon stamp which allowed you to catch and keep a specified maximum number of Kenai kings. If the fees for the stamps, which allow different numbers of kings to be kept, cost the following amount (in addition to the standard Alaskan resident fishing license fee) which one would you buy?

#### Choose one option

- ☐ No Extra Fee/Maximum 1 Kenai king allowed to be kept
- ☐ \$10/Maximum 2 Kenai kings allowed to be kept
- ☐ \$25/Maximum 3 Kenai kings allowed to be kept
- ☐ \$50/Maximum 5 Kenai kings allowed to be kept
- ☐ \$250/Maximum 10 Kenai kings allowed to be kept
- ☐ Would not fish for Kenai kings so no stamp needed

#### Situation 2

Here is a different situation. Now assume that special Kenai king salmon stamps cost the amounts listed below. Given the alternatives, which one would you buy?

#### Types of King Salmon Stamps (choose one)

- ☐ \$10/Maximum 1 Kenai king allowed
- ☐ \$50/Maximum 2 Kenai king allowed
- ☐ \$100/Maximum 3 Kenai king allowed
- ☐ \$500/Maximum 5 Kenai king allowed
- ☐ \$5,000/Maximum 10 Kenai king allowed
- ☐ Would not fish for Kenai kings so no stamp needed

#### Situation 3

Now we would like your opinion on what the Kenai king salmon stamps should cost Alaskan residents. Please indicate below how much you think the fee should be for each type of stamp. (Feel free to put in zero if you think there should be no special Kenai king salmon stamp and write in NOT ALLOWED if you think that no one should be permitted to catch and keep that number of Kenai kings.)

#### Stamp Would Allow

#### Fee Should Be

Maximum of 1 Kenai king to be kept	\$ _____
Maximum of 2 Kenai king to be kept	\$ _____
Maximum of 3 Kenai king to be kept	\$ _____
Maximum of 5 Kenai king to be kept	\$ _____
Maximum of 10 Kenai king to be kept	\$ _____

If this set of stamp fees was put into effect next year, which one would you obtain?

- ☐ Stamp allowing a maximum of 1 Kenai king to be kept
- ☐ Stamp allowing a maximum of 2 Kenai king to be kept
- ☐ Stamp allowing a maximum of 3 Kenai king to be kept
- ☐ Stamp allowing a maximum of 5 Kenai king to be kept
- ☐ Stamp allowing a maximum of 10 Kenai king to be kept

## SECTION V

### DEMOGRAPHIC INFORMATION

The following information is needed for statistical purposes and will be kept strictly confidential. (Please circle.)

1. Which one of the following best describes your personal employment status?
- |   |   |
|---|---|
| 1 - Annually employed by someone else   | 5 - Unemployed and looking for work     |
| 2 - Seasonally employed by someone else | 6 - Unemployed and not looking for work |
| 3 - Self employed                       | 7 - Retired                             |
| 4 - Homemaker                           | 8 - Other                               |

2. Which category best describes your household's 1985 income before taxes?

1 - Less than \$5,000	6 - \$30,000-39,999	11 - \$80,000-89,999
2 - \$5,000-9,999	7 - \$40,000-49,999	12 - \$90,000-99,999
3 - \$10,000-14,999	8 - \$50,000-59,999	13 - \$100,000-200,000
4 - \$15,000-19,999	9 - \$60,000-69,999	14 - \$200,000-500,000
5 - \$20,000-29,999	10 - \$70,000-79,999	15 - Over \$500,000

3. What is the highest level of education any member of your household has completed?

1 - Less than 8th grade	5 - Technical/secretarial school
2 - 8th grade	6 - Some college
3 - Some high school	7 - College degree
4 - High school graduate	8 - Post graduate study

4. What is the longest any member of your household has been a resident of Alaska?  
\_\_\_\_\_ years

5. In what ways do you feel sportfishing in Alaska could be improved?

(Recommendations which are specific will be more useful than those which are general.)

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper appears slightly aged or off-white. There is no handwriting or other markings on the page.

A-39

# Trip Log (Con't)

EXAMPLE: The Bass Household

Write in trip # (from calendar) here:

3. What was the DAY and APPROXIMATE TIME of DEPARTURE on this trip?

Day  
Time

4. What was the DAY and APPROXIMATE TIME of RETURN on this trip?

Day  
Time

5. What was the primary MEANS OF TRANSPORTATION used on this trip? (use the Transportation Codes listed below.)

6. How many HOUSEHOLD MEMBERS went on the trip (include yourself and other household members who went along but did not fish? Do not include people who went along but were NOT household members.)

7. How many HOUSEHOLD MEMBERS (including yourself) actually FISHED on this trip?

If you visited more than one site on a trip, use an additional column for each site and begin the next trip in the next "completely blank" column (see Example: Trip #2).

8. At what SITE(s) did members of your household fish on this trip? Please use the Site Codes listed on page 1. (If these site codes are needed but some sites have similar names, if more than one site was visited on any trip, please separately list each site visited on that trip, as shown in the example on page 4 (Trip #2).)

9. At this site, where did members of your household FISH? (Bank Only = "1", Boat Footplate Only = "2", Both Bank and Boat Footplate = "3".)

10. What was the approximate number of HOURS SPENT FISHING at this site by members of your household during this trip?

11. What was the TARGET SPECIES (i.e., the principal species which members of your household were trying to catch) at this site on this trip? If there was NO "Target Species," skip to Question 14.)

a. TYPE OF SPECIES using the Species Code below.

b. Approximate number of TARGET SPECIES CAUGHT at this site by all members of your household. If none were caught, please write "0".

12. What OTHER SPECIES were caught at this site by all members of your household? If no other species were caught, skip to Question 15.)

a. TYPE OF SPECIES using the Species Code below.

b. Approximate number of OTHER SPECIES CAUGHT by all members of your household.

13. What was the degree of CROWDING on this occasion at this site? Very Crowded = "1", Somewhat Crowded = "2", Not Crowded = "3", Wilderness Conditions = "4", Unsure = "5".

## TRANSPORTATION CODES:

1 = just walked by site 4 = truck/van

2 = motor lake/ATV 5 = car/pier/traiton vehicle

3 = car 6 = motor boat

7 = other boat

8 = airplane

9 = other

## SPECIES CODES:

KS - King Salmon

RI - Small King Salmon

RS - Red Salmon

SS - Silver Salmon

PS - Pink Salmon

CS - Chum Salmon

LL - Land-Locked Salmon

SH - Steelhead Trout

RT - Rainbow Trout

CT - Cutthroat Trout

BT - Brook Trout

LT - Lake Trout

DV - Dolly Varden

AC - Arctic Char

NQ - Northern Pike

GR - Arctic Grayling

SI - Shinerfish

WI - Whitefish

BB - Burbot

SM - Smelt/Ikooligan/Capelin

RF - Rockfish/Sea Bass

HA - Halibut

OF - Other Fin Fish Species

RC - Razor Clam

OS - Other Shell Fish

## MAILING INSTRUCTIONS / ENTRY BLANK

Thank you for completing this survey. To return this questionnaire, please fold along the fold marks on the back and affix the adhesive strip. Return postage is guaranteed.

If you would like to enter the prize drawing, fill out the information below. Upon checking for completeness of the questionnaire, this page will be detached from the survey and your name entered in the drawing. This will ensure confidentiality of your response.

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



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# Sport Fishing-Related Business Survey

# ALASKA DEPARTMENT OF FISH AND GAME

## SOUTHCENTRAL ALASKA SPORTFISHING ECONOMIC STUDY

### Business Sector Survey Card

Business Name \_\_\_\_\_

Contact Person: \_\_\_\_\_

Address: \_\_\_\_\_ Phone # \_\_\_\_\_

- A-43
1. Please indicate which one of the following categories best describes your business: (Circle the number by the most appropriate category.)
    - 01 variety/department store
    - 02 general sporting goods store
    - 03 specialty fishing store
    - 04 hotel/motel
    - 05 eating/drinking establishment
    - 06 trailer park/campground
    - 07 transportation services (e.g., boat, air taxi operators, etc.)
    - 08 fish packing/processing business
    - 09 fishing lodge/camp
    - 10 travel/booking agent
    - 11 marine/boat and accessories business
    - 12 guide business
    - 13 retail food and liquor stores
    - 14 other (please specify) \_\_\_\_\_
  2. If the category that best describes your business is GUIDE BUSINESS, what percentage of your gross annual revenues come from providing guiding services to SPORTFISHERMEN? \_\_\_\_\_ %
  3. Which ONE of the following statements best describes the seasonal characteristics of your business operation:
    - 01 The business operates year-round, but at a MUCH HIGHER level during the fishing season.
    - 02 The business operates year-round at approximately the SAME level.
    - 03 The business operates year-round, but at a LOWER level during the fishing season.
    - 04 The business operates ONLY during the fishing season.
    - 05 Other. (Please describe.) \_\_\_\_\_
  4. Which category best describes your 1985 gross revenues from this business?
    - 01 less than \$49,999
    - 02 \$50,000 - \$99,999
    - 03 \$100,000 - \$249,999
    - 04 \$250,000 - \$499,999
    - 05 \$500,000 - \$1,000,000
    - 06 over \$1,000,000
  5. Approximately what percentage of your business's gross annual income comes from sales or services related to sportfishing activities (for example, mounting fish; transporting clients to fishing areas; booking fishing trips; selling tackle, gear, fuel, or food for fishing expeditions; selling wholesale/retail sporting goods used on fishing trips, etc.)? \_\_\_\_\_ %
  6. Do you sell fishing licenses?
    - 01 Yes
    - 02 No

**SOUTHCENTRAL**

**ALASKA**

**SPORTFISHING**

**ECONOMIC**

**STUDY**

**BUSINESS SECTOR SURVEY**



# INSTRUCTIONS

This questionnaire has 5 sections:

- I. General Business Information
- II. Capital Equipment
- III. Labor Services
- IV. Annual Operational Expenditures
- V. Annual Sales

Most of the questions in this survey pertain to your business operations, including expenditures and sales, during the 1985/86 sport fishing season (OCTOBER 1985-SEPTEMBER 1986). Information over several years, however, is requested on purchases of major capital items used in your business (Section II).

To estimate the impacts of sport fishing on the economy, the economic model used in this study requires relatively detailed data. As a result, many of the questions request fairly detailed information.

We realize that detailed records may not be readily available to precisely answer all questions. What we are looking for, however, is your best estimate rather than leaving the question blank.

If you have any questions about the survey, please don't hesitate to call Ms. M.A. Higgins at 561-0093 in Anchorage, between 8:00 a.m. and 5:00 p.m., Monday through Friday.

**SPORT FISHING IS AN IMPORTANT ECONOMIC ACTIVITY IN  
SOUTHCENTRAL ALASKA. ONLY WITH YOUR PARTICIPATION CAN ITS  
ECONOMIC IMPORTANCE BE FULLY UNDERSTOOD.**

## SECTION I

### GENERAL BUSINESS INFORMATION

The following questions ask about the type of business you operate and the kinds of goods and services you offer to anglers.

1. Please indicate which one of the following categories BEST describes your business: (Circle the number preceding the most appropriate category.)

- |   |  |
|---|--|
| 01 variety/department store                                       | 08 fishing packing/processing business   |
| 02 general sporting goods   | 09 fishing lodge/camp                    |
| 03 specialty fishing store  | 10 travel/booking agent                  |
| 04 hotel/motel  | 11 marine/boats and accessories business |
| 05 eating/drinking establishment                                  | 12 guide business                        |
| 06 trailer park/campground  | 13 retail food and liquor store          |
| 07 transportation services (e.g., boat, air taxi operators, etc.) |  |

14 other (please specify) \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

2. Please indicate ALL of the following types of goods and services which your business provides to sport fishermen: (Circle the number next to each appropriate category.)

- |                                      |                                 |
|--------------------------------------|---------------------------------|
| 01 boating equipment and accessories | 08 boat/airplane transportation |
| 02 hiking and camping supplies       | 09 other transportation         |
| 03 clothing                          | 10 fish packing/processing      |
| 04 food and beverages                | 11 fish mounting/taxidermy      |
| 05 lodging                           | 12 fishing equipment rental     |
| 06 fishing gear and equipment        | 13 motor fuel                   |
| 07 guiding services                  |                                 |

14 other (please specify) \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

## SECTION II CAPITAL EQUIPMENT

To better understand the impact of sport fishing on Alaska's economy, we need to know about purchases of capital equipment used in your business. We are interested in purchases of major equipment made for your business during the last 10 years and still in use. Each item must have an initial cost of \$500 or more, and a useful life greater than 1 year. These items include the following:

- A. Transportation-related Equipment—including boats, motors, vehicles, travel trailers, airplanes, ATVs, etc.
- B. Other Equipment—including nontransportation-related motorized equipment, office equipment, furniture, etc.

For each item, we are interested in: (1) the approximate initial cost; (2) the year in which this item was purchased; (3) the purchase location; (4) the approximate year you expect to replace the item; and (5) the percent of use related to your business.

If you have purchased FISHING EQUIPMENT/GEAR over the last 5 years that you still use in your business, we are also interested in some information about this equipment, requested in Section C below.

### A. TRANSPORTATION-RELATED EQUIPMENT

Item	(1) Approximate Initial Cost	(2) Year Purchased (1977-1986)	(3) Purchase Location (please check)					(4) Approximate Year of Expected Replacement	(5) % of Use Related to Your Business
			Anchorage Area	Kenai Penin.	Juneau Area	Fairbanks and Other AK	Outside AK		
EXAMPLE: TRUCK	\$ 9,000	1982	X					1988	60 %
1. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %
2. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %
3. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %
4. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %
5. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %
6. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %
7. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %
8. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %
9. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %
10. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %

## B. OTHER EQUIPMENT

Item	(1) Approximate Initial Cost	(2) Year Purchased (1977-1986)	(3) Purchase Location (please check)					(4) Approximate Year of Expected Replacement	(5) % of Use Related to Your Business
			Anchorage Area	Kenai Penin.	Juneau Area	Fairbanks and Other AK	Outside AK		
EXAMPLE: OFFICE EQUIPMENT	\$1,500	1983				X		1987	100 %
1. _____	\$ _____								____ %
2. _____	\$ _____								____ %
3. _____	\$ _____								____ %
4. _____	\$ _____								____ %
5. _____	\$ _____								____ %
6. _____	\$ _____								____ %
7. _____	\$ _____								____ %
8. _____	\$ _____								____ %
9. _____	\$ _____								____ %
10. _____	\$ _____								____ %

## C. FISHING GEAR/EQUIPMENT

21. Approximately how much have you spent in total over the last 5 years on sportfishing gear and equipment which is still used to service sport fishing clientele? \$ \_\_\_\_\_
22. What is the average age of this equipment? \_\_\_\_\_ years
23. What percent of this equipment/gear was purchased in the following locations?

Location	% of Total Purchases
Anchorage Area	_____ %
Kenai Peninsula	_____ %
Juneau Area	_____ %
Fairbanks and Other Alaska	_____ %
Outside Alaska	_____ %



### SECTION III

#### LABOR SERVICES

To understand the impact of sport fishing on Alaska's economy, it is very important to estimate the number of persons whose jobs depend on sport fishing activity. Please answer the following questions as best you can.

1. How many persons (other than subcontractors and yourself) did you employ between October 1985 and September 1986? \_\_\_\_\_ persons
2. What was the approximate total payroll during this period? \$ \_\_\_\_\_
3. Considering part-time employment, how many person-months did the employees reported in Question 1 represent? \_\_\_\_\_ person-months

EXAMPLE: 1 full-time employee for 3 months ( $1 \times 3 = 3$ )  
and 3 part-time employees at 20 hrs./wk. for 2 months ( $3 \times \frac{1}{2} \times 2 = 3$ )  
is equivalent to 6 ( $3 + 3$ ) person-months.

4. Approximately what percentage of the person-months reported in Question 3 was sport fishing-related? \_\_\_\_\_ %

### SECTION IV

#### ANNUAL OPERATIONAL EXPENDITURES

To estimate the economic impact of sport fishing, we need to know about non-labor expenses that you incur in the normal day-to-day operation of your business.

We are interested in the approximate annual amount spent in the following expenditure categories and an estimate of the amount spent in the geographical areas identified below. (What we are interested in is where you send your payment check.) Please include only those expenditures that are directly related to your business, and that were made between October 1985 and September 1986. Leave all the unrelated categories blank.

We realize it may be difficult for you to precisely estimate total expenditures and where they were made. It is very important for the economic model, however, that you make a best estimate about these questions, even if you are uncertain.

An example is provided below.

**APPROXIMATE  
TOTAL DOLLARS  
SPENT BETWEEN  
OCT. 1985  
& SEPT. 1986** =

**Expenditure  
Category**

**Where the Payment Was Sent**

		<b>Anchorage Area</b>	<b>Kenai Penin.</b>	<b>Juneau Area</b>	<b>Fairbanks &amp; Other Alaska</b>	<b>Outside Alaska</b>
<b>EXAMPLE</b> Annual property expenses (mortgage payments to an Anchorage bank).	\$ 8,000	\$ 8,000	\$	\$	\$	\$
1. Annual property expenses (excluding maintenance and taxes, which are asked elsewhere)						
a. Annual rental/lease payments	\$	\$	\$	\$	\$	\$
b. Annual mortgage payments	\$	\$	\$	\$	\$	\$
2. Other annual rental/lease costs (e.g., boats, aircraft, other motor vehicles, equipment, etc.)	\$	\$	\$	\$	\$	\$
3. Utilities (e.g., gas, electricity, telephone, etc.)	\$	\$	\$	\$	\$	\$
4. Motor fuel, oil, other petroleum products <sup>1</sup>	\$	\$	\$	\$	\$	\$
5. Maintenance/repairs						
a. Real property/improvements	\$	\$	\$	\$	\$	\$
b. Vehicles/equipment (e.g., boats, aircraft)	\$	\$	\$	\$	\$	\$
6. Supplies and goods for resale (e.g., fishing supplies, food and beverages, tackle, fishing gear/equipment)	\$	\$	\$	\$	\$	\$
7. Office supplies	\$	\$	\$	\$	\$	\$
8. Insurance	\$	\$	\$	\$	\$	\$
9. Transportation and freight (e.g., airport tie-down fees, boat dock fees, air freight)	\$	\$	\$	\$	\$	\$
10. Taxes, licenses and permits						
a. Federal	\$	\$	\$	\$	\$	\$
b. State	\$	\$	\$	\$	\$	\$
c. Local (sales, property, etc.)	\$	\$	\$	\$	\$	\$
d. Other (e.g., native corp.)	\$	\$	\$	\$	\$	\$
11. Professional services (e.g., accountants, attorneys, commissions etc.)	\$	\$	\$	\$	\$	\$
12. Advertising/PR	\$	\$	\$	\$	\$	\$
13. Other expenditures, excluding labor (please specify)						
a. _____	\$	\$	\$	\$	\$	\$
b. _____	\$	\$	\$	\$	\$	\$

## SECTION V ANNUAL SALES

The following questions ask about business sales during the period October 1985 through September 1986. **THE DATA WILL ONLY BE USED IN AN AGGREGATE FORM AND ALL INFORMATION WILL BE CONSIDERED STRICTLY CONFIDENTIAL.**

1. What were the APPROXIMATE gross sales of this business during the period October 1985 through September 1986? \$ \_\_\_\_\_
2. Of the amount you recorded in Question 1, approximately what percentage was generated from the sales of sport fishing products and services? \_\_\_\_\_ %

Of these sport fishing-related revenues, approximately what proportion was generated in each of the following categories:

- |     |  |  |
|-----|--|--|
| (a) | Fishing tackle/bait                          | _____ %                                      |
| (b) | Other fishing gear                           | _____ %                                      |
| (c) | Food and beverages                           | _____ %                                      |
| (d) | Lodging including meal packages              | _____ %                                      |
| (e) | Equipment rental                             | _____ %                                      |
| (f) | Transportation (other than guiding services) | _____ %                                      |
| (g) | Guiding activities                           | _____ %                                      |
| (h) | Other (please specify)                       |  |
|     | (e.g., entertainment for fishing parties;    |  |
|     | commissions on guiding services and travel)  |  |
|     | _____  | _____ %                                      |
|     | _____  | _____ %                                      |
|     | _____  | _____ %                                      |
|     |  | = 100% of sport fishing-<br>related revenues |

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## GENERAL COMMENTS

Please provide any comments in the space below.

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## OPTIONAL

Thank you for completing this survey. If you would like to receive a copy of the "Executive Summary" of the findings of the study, put a check in the following box and fill out the information below. After data verification is complete, this form will be detached from your survey to protect the confidentiality of your response. You may be recontacted, however, for data verification purposes.

☐

I would like to receive my copy of the "Executive Summary" of the study findings.

BUSINESS NAME: \_\_\_\_\_

CONTACT PERSON: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

PHONE NUMBER: \_\_\_\_\_

**THANK YOU VERY MUCH  
FOR YOUR ASSISTANCE**





# Sport Fishing Guide Survey

## GUIDE SERVICES SURVEY

Contact Person \_\_\_\_\_

Permanent Business Address \_\_\_\_\_

\_\_\_\_\_ Phone Number (      ) \_\_\_\_\_

1. Which of the following categories best describes your type of business operation? (please circle one answer)

1 - Owner of a guide/charter service

2 - Subcontractor that works for other guide/charter operations

3 - Other (please specify) \_\_\_\_\_

2. Did you provide guide services in 1985?

1- Yes    2 - No

If YES, approximately what percentage of your 1985 annual revenues came from providing guide services to SPORTFISHERMEN? \_\_\_\_\_ %

3. Have you provided (or do you expect to provide) sport-fishing guide services during 1986?

1 - Yes    2 - No

If NO, this completes the survey - please drop this card in the nearest mailbox.

4. In what month in 1986 did you (or do you expect to) end your guide services to SPORTFISHERMEN? \_\_\_\_\_

5. Do you live in Alaska year round?    1 - Yes    2 - No

THANK YOU FOR YOUR PARTICIPATION.



# **SOUTHCENTRAL ALASKA SPORTFISHING ECONOMIC STUDY**

**GUIDE SECTOR SURVEY**



## INSTRUCTIONS

This questionnaire has 5 sections:

- I. Guiding Activity (October 1985 - September 1986)
- II. Capital Equipment
- III. Labor Services
- IV. Annual Operational Expenditures
- V. Annual Sales

Most of the questions in this survey pertain to your business operations, including expenditures and sales, during the 1985/86 sport fishing season (OCTOBER 1985-SEPTEMBER 1986). Information over several years, however, is requested on purchases of major capital items used in your business (Section II).

To estimate the impacts of sport fishing on the economy, the economic model used in this study requires relatively detailed data. As a result, many of the questions request fairly detailed information.

We realize that detailed records may not be readily available to precisely answer all questions. What we are looking for, however, is your best estimate rather than leaving the question blank.

If you have any questions about the survey, please don't hesitate to call Ms. M.A. Higgins at 561-0093 in Anchorage, between 8:00 a.m. and 5:00 p.m., Monday through Friday.

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ECONOMIC IMPORTANCE BE FULLY UNDERSTOOD.**

## SECTION I

### GUIDING ACTIVITY (OCTOBER 1985–SEPTEMBER 1986)

1. Which of the following types of guiding services did you provide in the period of October 1985 through September 1986? (please check)

☐ Sport fishing - saltwater      ☐ Sightseeing  
☐ Sport fishing - freshwater      ☐ Hunting  
☐ Other (please specify) \_\_\_\_\_

2. Approximately what percentage of your guiding activities between October 1985 and September 1986 were as a sport fishing guide?  
 \_\_\_\_\_%

3. Which of the following **SPORT FISHING** guide activities in Alaska did you engage in between October 1985 and September 1986?  
☐ Airplane      ☐ River guide (powerboat)  
☐ Charter boat (saltwater)      ☐ Other (e.g. river rafting, please specify) \_\_\_\_\_

4. What percentage of your **SPORT FISHING** guide activities in Alaska between October 1985 and September 1986 occurred in the following areas? (Please refer to map on the back cover.)

\_\_\_\_\_ % Glennallen  
 \_\_\_\_\_ % Prince William Sound  
 \_\_\_\_\_ % Knik Arm Drainage  
 \_\_\_\_\_ % Anchorage  
 \_\_\_\_\_ % East Susitna Drainage  
 \_\_\_\_\_ % West Side Cook Inlet/West Susitna Drainage  
 \_\_\_\_\_ % Kenai Peninsula  
 \_\_\_\_\_ % Other Alaska  
 \_\_\_\_\_ = 100%

5. Approximately how many days per month during the 1986 summer sport fishing season (May through September) did you provide guiding or other services to paying sport fishing clientele?

Month	Approximate Number of Days of Sport Fishing Guiding Service
May	_____ days
June	_____ days
July	_____ days
August	_____ days
September	_____ days

6. Which of the following services did you offer your **SPORT FISHING** clientele during the 1986 summer sport fishing season?

#### TRANSPORTATION

☐ Boats      ☐ Auto/truck/bus  
☐ Personally owned aircraft      ☐ Airport pickup  
☐ Charter aircraft      ☐ ATV  
☐ Other (please specify) \_\_\_\_\_

#### ACCOMMODATIONS

☐ Lodge      ☐ Meals  
☐ Cabins      ☐ RV parking  
☐ Base camp      ☐ Hotel  
☐ Temporary camps/trailers  
☐ Other (please specify) \_\_\_\_\_

#### OTHER SERVICES

☐ Fishing tackle      ☐ Fish prep/shipping  
☐ Other fishing gear      ☐ Fish smoking  
☐ Bait      ☐ Fish mounting/taxidermy  
☐ Ice/freezing      ☐ Fishing license  
☐ Other (please specify) \_\_\_\_\_

7. On average, how many trips did you make per day during the 1986 summer sport fishing season with your boats, aircraft or other modes transporting clients in conjunction with **SPORT FISHING** guide activities? (If you did not provide one or more of these services, please write in N/A.)  
 \_\_\_\_\_ Average number of boat trips per day  
 \_\_\_\_\_ Average number of aircraft trips per day  
 \_\_\_\_\_ Average number of trips per day by other transportation modes

8. What was your average charge per person per trip for the following guiding services? (If you did not provide one or more of these services, please write in N/A.)

\$ \_\_\_\_\_ Accompanied day trips—together with your clients—to your camp/other location.  
 \$ \_\_\_\_\_ Accompanied multiple day trips—together with your clients—to your camp/other location  
 \$ \_\_\_\_\_ Unaccompanied (i.e., drop-off service) trips to client selected location  
 \$ \_\_\_\_\_ Unaccompanied day trips to your camp/other location  
 \$ \_\_\_\_\_ Unaccompanied multiple day trips to your camp/other location

## SECTION II CAPITAL EQUIPMENT

To better understand the impact of sport fishing on Alaska's economy, we need to know about purchases of capital equipment used in your business. We are interested in purchases of major equipment made for your business during the last 10 years and still in use. Each item must have an initial cost of \$500 or more, and a useful life greater than 1 year. These items include the following:

- A. Transportation-related Equipment—including boats, motors, vehicles, travel trailers, airplanes, ATVs, etc.
- B. Other Equipment—including nontransportation-related motorized equipment, office equipment, furniture, etc.

For each item, we are interested in: (1) the approximate initial cost; (2) the year in which this item was purchased; (3) the purchase location; (4) the approximate year you expect to replace the item; and (5) the percent of use related to your business.

If you have purchased FISHING EQUIPMENT/GEAR over the last 5 years that you still use in your business, we are also interested in some information about this equipment, requested in Section C below.

### A. TRANSPORTATION-RELATED EQUIPMENT

Item	(1) Approximate Initial Cost	(2) Year Purchased (1977-1986)	(3) Purchase Location (please check)					(4) Approximate Year of Expected Replacement	(5) % of Use Related to Your Business
			Anchorage Area	Kenai Penin.	Juneau Area	Fairbanks and Other AK	Outside AK		
EXAMPLE: TRUCK	\$9,000	1982	X					1988	60 %
1. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %
2. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %
3. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %
4. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %
5. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %
6. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %
7. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %
8. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %
9. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %
10. _____	\$ _____	_____	_____	_____	_____	_____	_____	_____	_____ %

## B. OTHER EQUIPMENT

Item	(1) Approximate Initial Cost	(2) Year Purchased (1977-1986)	(3) Purchase Location (please check)					(4) Approximate Year of Expected Replacement	(5) % of Use Related to Your Business
			Anchorage Area	Kenai Penin.	Juneau Area	Fairbanks and Other AK	Outside AK		
EXAMPLE: <u>OFFICE EQUIPMENT</u>	<u>\$1,500</u>	<u>1983</u>				<u>X</u>		<u>1987</u>	<u>100</u> %
1. _____	\$ _____								_____ %
2. _____	\$ _____								_____ %
3. _____	\$ _____								_____ %
4. _____	\$ _____								_____ %
5. _____	\$ _____								_____ %
6. _____	\$ _____								_____ %
7. _____	\$ _____								_____ %
8. _____	\$ _____								_____ %
9. _____	\$ _____								_____ %
10. _____	\$ _____								_____ %

## C. FISHING GEAR/EQUIPMENT

21. Approximately how much have you spent in total over the last 5 years on sportfishing gear and equipment which is still used to service sport fishing clientele? \$ \_\_\_\_\_
22. What is the average age of this equipment? \_\_\_\_\_ years
23. What percent of this equipment/gear was purchased in the following locations?

Location	% of Total Purchases
Anchorage Area	_____ %
Kenai Peninsula	_____ %
Juneau Area	_____ %
Fairbanks and Other Alaska	_____ %
Outside Alaska	_____ %

100%

### SECTION III LABOR SERVICES

To understand the impact of sport fishing on Alaska's economy, it is very important to estimate the number of persons whose jobs depend on sport fishing activity. Please answer the following questions as best you can.

1. How many persons (other than subcontractors and yourself) did you employ between October 1985 and September 1986? \_\_\_\_\_ persons
2. What was the approximate total payroll during this period? \$ \_\_\_\_\_
3. Considering part-time employment, how many person-months did the employees reported in Question 1 represent? \_\_\_\_\_ person-months

EXAMPLE: 1 full-time employee for 3 months ( $1 \times 3 = 3$ )  
and 3 part-time employees at 20 hrs./wk. for 2 months ( $3 \times \frac{1}{2} \times 2 = 3$ )  
is equivalent to 6 ( $3 + 3$ ) person-months.

4. Approximately what percentage of the person-months reported in Question 3 was sport fishing-related? \_\_\_\_\_ %

### SECTION IV

#### ANNUAL OPERATIONAL EXPENDITURES

To estimate the economic impact of sport fishing, we need to know about non-labor expenses that you incur in the normal day-to-day operation of your business.

We are interested in the approximate annual amount spent in the following expenditure categories and an estimate of the amount spent in the geographical areas identified below. (What we are interested in is where you send your payment check.) Please include only those expenditures that are directly related to your business, and that were made between October 1985 and September 1986. Leave all the unrelated categories blank.

We realize it may be difficult for you to precisely estimate total expenditures and where they were made. It is very important for the economic model, however, that you make a best estimate about these questions, even if you are uncertain.

An example is provided below.

Expenditure  
Category

APPROXIMATE  
TOTAL DOLLARS  
SPENT BETWEEN  
OCT. 1985  
& SEPT. 1986

Where the Payment Was Sent

		Anchorage Area	Kenai Penin.	Juneau Area	Fairbanks & Other Alaska	Outside Alaska
<b>EXAMPLE</b> Annual property expenses (mortgage payments to an Anchorage bank).	\$ 8,000	\$ 8,000	\$	\$	\$	\$
1. Annual property expenses (excluding maintenance and taxes, which are asked elsewhere)						
a. Annual rental/lease payments	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
b. Annual mortgage payments	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
2. Other annual rental/lease costs (e.g., boats, aircraft, other motor vehicles, equipment, etc.)	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
3. Utilities (e.g., gas, electricity, telephone, etc.)	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
4. Motor fuel, oil, other petroleum products	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
5. Maintenance/repairs						
a. Real property/improvements	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
b. Vehicles/equipment (e.g., boats, aircraft)	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
6. Supplies and goods for resale (e.g., fishing supplies, food and beverages, tackle, fishing gear/equipment)	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
7. Office supplies	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
8. Insurance	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
9. Transportation and freight (e.g., airport tie- down fees, boat dock fees, air freight)	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
10. Taxes, licenses and permits						
a. Federal	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
b. State	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
c. Local (sales, property, etc.)	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
d. Other (e.g., native corp.)	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
11. Professional services (e.g., accountants, attorneys, commissions etc.)	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
12. Advertising/PR	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
13. Other expenditures, excluding labor (please specify)						
a. _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
b. _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____

## SECTION V

### ANNUAL SALES

The following questions ask about business sales during the period October 1985 through September 1986. **THE DATA WILL ONLY BE USED IN AN AGGREGATE FORM AND ALL INFORMATION WILL BE CONSIDERED STRICTLY CONFIDENTIAL.**

1. What were the APPROXIMATE gross sales of this business during the period October 1985 through September 1986? \$ \_\_\_\_\_
2. Of the amount you recorded in Question 1, approximately what percentage was generated from the sales of sport fishing products and services? \_\_\_\_\_%
3. Of your sport fishing-related revenues between October 1985 and September 1986, approximately what percentage was generated from "package deals"? \_\_\_\_\_%

Of the non-package revenues related to sport fishing, approximately what proportion was generated in each of the following categories:

- |     |  |         |
|-----|--|---------|
| (a) | Fishing tackle/bait                          | _____ % |
| (b) | Other fishing gear                           | _____ % |
| (c) | Food and beverages                           | _____ % |
| (d) | Lodging including meal packages              | _____ % |
| (e) | Equipment rental                             | _____ % |
| (f) | Transportation (other than guiding services) | _____ % |
| (g) | Guiding activities                           | _____ % |
| (h) | Other (please specify)                       |         |
|     | (e.g., entertainment for fishing parties;    |         |
|     | commissions on guiding services and travel)  |         |
|     | _____  | _____ % |
|     | _____  | _____ % |
|     | _____  | _____ % |

= 100% of non-package  
revenues related to sport fishing








1

Thank you for completing this survey. If you would like to receive a copy of the "Executive Summary" of the findings of the study, put a check in the following box and fill out the information below. After data verification is complete, this form will be detached from your survey to protect the confidentiality of your response. You may be recontacted, however, for data verification purposes.

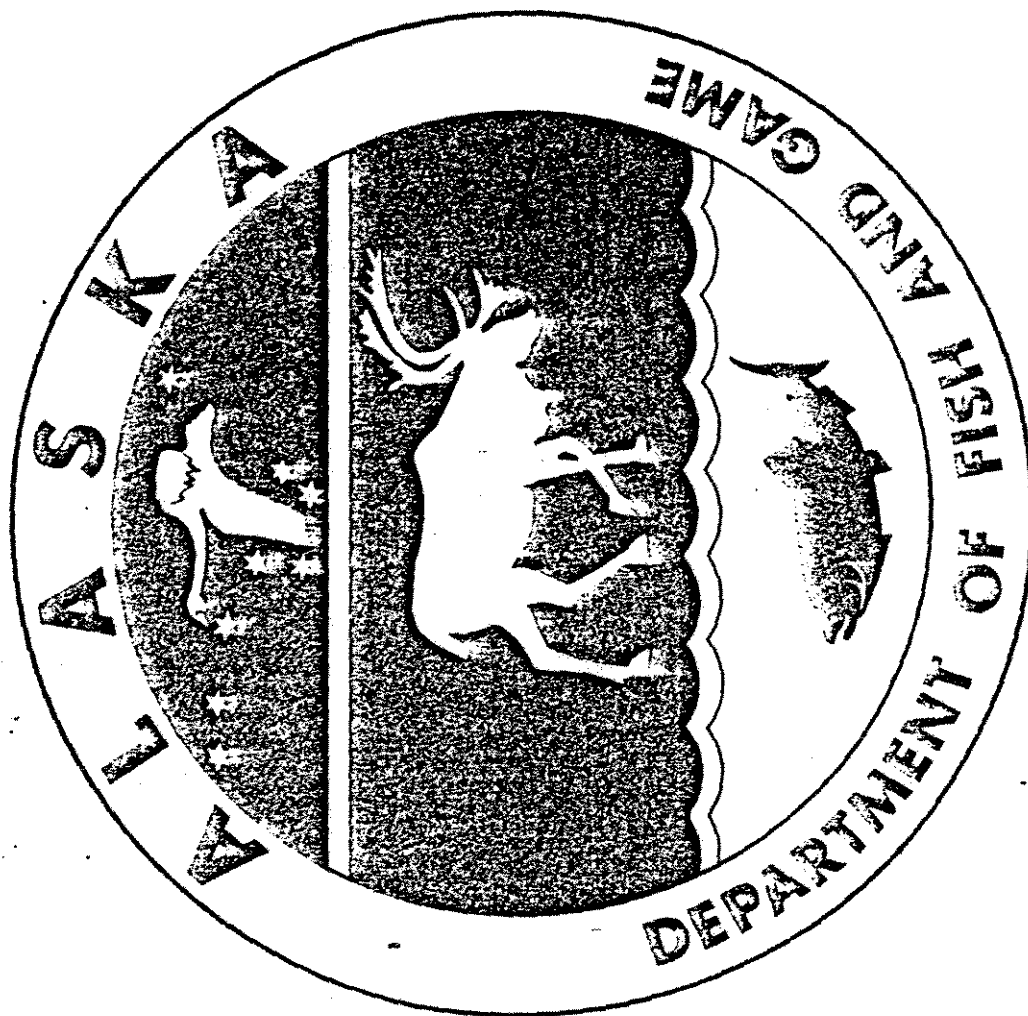
BUSINESS NAME: \_\_\_\_\_

CONTACT PERSON: \_\_\_\_\_

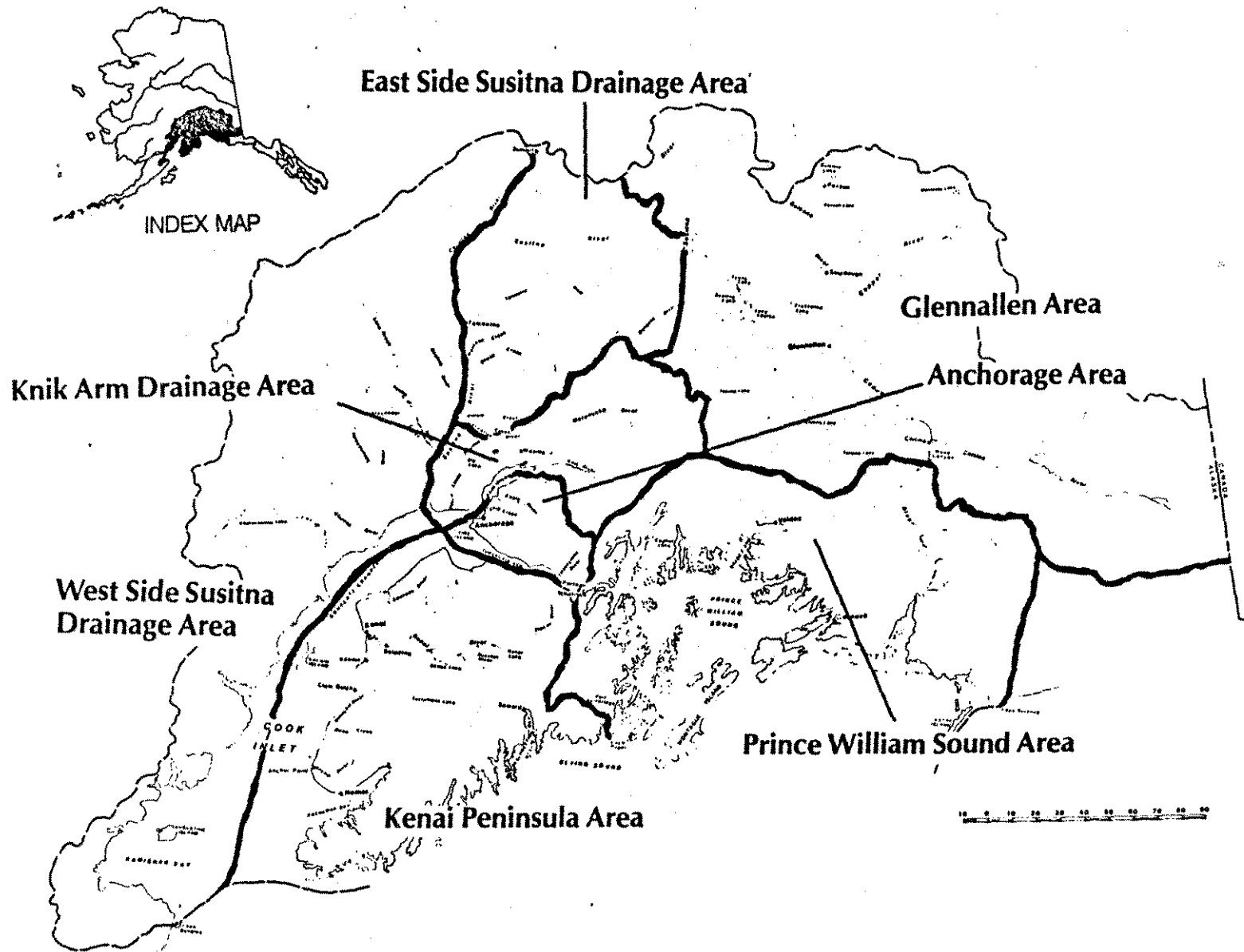
ADDRESS: \_\_\_\_\_

PHONE NUMBER: \_\_\_\_\_

THANK YOU VERY MUCH  
FOR YOUR ASSISTANCE



# Southcentral Alaska



Appendix B

RESIDENT AND NONRESIDENT ANGLER  
SPENDING PROFILES

**RESIDENT ANGLER SPENDING  
PROFILES**



List of Southcentral Alaska Sport Fishing Sites

Area Code	Name of Area/Site	Area Code	Name of Area/Site
	<u>Glennallen Area (I)</u>		<u>East Side Susitna Drainage Area (M)</u>
I-1	Gulkana River (Paxson-Sourdough)	M-1	Clear Creek
I-2	Gulkana River (Sourdough-Highway)	M-2	Montana Creek
I-3	Gulkana River (Other)	M-3	Caswell Creek
I-4	Tyone, Susitna, Louise Lakes	M-4	Willow Creek/Little Willow Creek
I-5	Other freshwater sites		<u>West Side Cook Inlet/West Side Susitna Drainage Area (N)</u>
	<u>Prince William Sound (J)</u>	N-1	Deshka River-Kroto Creek
J-1	Valdez Bay	N-2	Lake Creek
J-2	Passage Canal (Whittier)	N-3	Alexander Creek
J-3	Other saltwater sites	N-4	Talachulitna River
J-4	Freshwater sites	N-5	Chuitna River
	<u>Knik Arm Drainage Area (K)</u>	N-6	Theodore, Lewis, and Ivan Rivers
K-1	Little Susitna River	N-7	Other freshwater sites
K-2	Knik River	N-8	Saltwater sites
K-3	Wasilla and Cottonwood Creeks		<u>Kenai Peninsula Area (P)</u>
K-4	Big Lake	P-1	Kenai River (Cook Inlet to Soldotna Bridge)
K-5	Kepler Complex	P-2	Kenai River (Soldotna Bridge to Moose River)
K-6	Finger Lake	P-3	Kenai River (Moose River to Skilak Outlet)
K-7	Wasilla Lake	P-4	Kenai River (Skilak Inlet to Kenai Lake)
K-8	Other freshwater sites	P-5	Skilak Lake
K-9	Saltwater sites	P-6	Kenai Lake
	<u>Anchorage Area (L)</u>	P-7	Russian River
L-1	Anchorage Area Lakes	P-8	Kasilof River
L-2	Bird Creek	P-9	Ninilchik River
L-3	Campbell Creek	P-10	Anchor River
L-4	Twentymile River	P-11	Deep Creek (freshwater)
L-5	Other freshwater sites	P-12	Other freshwater sites
L-6	Saltwater sites	P-13	Deep Creek (saltwater)
		P-14	Kachemak Bay (Homer)

# Southcentral Alaska Resident Angler Spending Profile\*

All Sites  
All Species

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	395	2,057	420
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$15.01	\$28.03	\$46.47
Airplane	6.73	20.22	20.71
Boat	8.92	7.14	13.06
Other	4.51	2.24	5.19
Onsite Fishing <sup>6</sup>			
Consumable Tackle	7.75	9.84	12.22
Onsite boating costs	3.20	5.09	7.22
Guide fees	2.76	8.62	6.43
Food and Beverages <sup>7</sup>	15.18	26.87	36.46
Lodging Expenses <sup>8</sup>	1.20	9.18	6.70

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.



# Southcentral Alaska Resident Angler Spending Profile\*

All Sites  
Target Species: King Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	60	347	33
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$14.50	\$29.83	\$67.00
Airplane	0.33	19.38	0
Boat	1.68	7.69	6.64
Other	0.50	1.12	0
Onsite Fishing <sup>6</sup>			
Consumable Tackle	16.68	10.22	22.88
Onsite boating costs	2.78	4.07	6.30
Guide fees	3.33	10.63	24.40
Food and Beverages <sup>7</sup>	14.37	28.24	43.88
Lodging Expenses <sup>8</sup>	0.17	4.45	6.70

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for each site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile \*

All Sites  
Target Species: Halibut

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	47	182	31
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$17.89	\$45.40	\$95.74
Airplane	0	11.31	8.06
Boat	19.06	27.18	60.32
Other	0.11	6.76	1.29
Onsite Fishing <sup>6</sup>			
Consumable Tackle	8.55	10.98	21.61
Onsite boating costs	5.21	25.47	29.87
Guide fees	7.02	43.03	15.97
Food and Beverages <sup>7</sup>	18.94	41.21	69.19
Lodging Expenses <sup>8</sup>	0.34	15.73	29.81

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for each site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile \*

All Sites  
Target Species: Razor Clams

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	12	27	0
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$8.58	\$46.67	n/a
Airplane	2.50	0.74	n/a
Boat	0	0.74	n/a
Other	0	0	n/a
Onsite Fishing <sup>6</sup>			
Consumable Tackle	0.83	4.93	n/a
Onsite boating costs	0.42	0	n/a
Guide fees	0	0	n/a
Food and Beverages <sup>7</sup>	7.00	32.78	n/a
Lodging Expenses <sup>8</sup>	0	0	n/a

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for each site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

Southcentral Alaska Resident Angler Spending Profile \*

Fishing Site: Gulkana River (I-1, I-2, I-3)  
All Species

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	1	23	46
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$50.00	\$40.57	\$47.24
Airplane	0	2.17	0
Boat	0	1.39	9.22
Other	0	0	5.43
Onsite Fishing <sup>6</sup>			
Consumable Tackle	6.00	11.13	11.30
Onsite boating costs	0	3.70	3.37
Guide fees	0	2.17	0.98
Food and Beverages <sup>7</sup>	50.00	34.57	41.85
Lodging Expenses <sup>8</sup>	0	3.70	1.52

Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile \*

Fishing Site: Gulkana River (I-1, I-2, I-3)  
Target Species: Arctic Grayling

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	0	7	12
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	n/a	\$51.42	\$43.45
Airplane	n/a	0	0
Boat	n/a	0	9.09
Other	n/a	0	21.81
Onsite Fishing <sup>6</sup>			
Consumable Tackle	n/a	4.71	6.36
Onsite boating costs	n/a	7.14	0.91
Guide fees	n/a	0	0
Food and Beverages <sup>7</sup>	n/a	40.42	41.36
Lodging Expenses <sup>8</sup>	n/a	5.71	0

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile \*

Fishing Site: Little Susitna River (K-1)  
Target Species: King Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	1	30	0
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$ 0	\$17.37	n/a
Airplane	20.00	0	n/a
Boat	0	2.70	n/a
Other	0	1.25	n/a
Onsite Fishing <sup>6</sup>			
Consumable Tackle	0	7.96	n/a
Onsite boating costs	0	0.21	n/a
Guide fees	0	0	n/a
Food and Beverages <sup>7</sup>	0	10.66	n/a
Lodging Expenses <sup>8</sup>	0	0.21	n/a

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

Southcentral Alaska Resident Angler Spending Profile\*

Fishing Site: Little Susitna River (K-1)  
Target Species: Silver Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	0	20	1
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	n/a	\$12.81	0
Airplane	n/a	0	0
Boat	n/a	4.81	0
Other	n/a	0	0
Onsite Fishing <sup>6</sup>			
Consumable Tackle	n/a	8.69	0
Onsite boating costs	n/a	1.13	0
Guide fees	n/a	0	0
Food and Beverages <sup>7</sup>	n/a	17.25	0
Lodging Expenses <sup>8</sup>	n/a	0.63	0

Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile \*

Fishing Site: Kepler Complex (K-5)  
Target Species: Rainbow Trout & Landlocked Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	0	22	0
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	n/a	\$ 6.95	n/a
Airplane	n/a	0	n/a
Boat	n/a	1.16	n/a
Other	n/a	0	n/a
Onsite Fishing <sup>6</sup>			
Consumable Tackle	n/a	4.37	n/a
Onsite boating costs	n/a	0.89	n/a
Guide fees			
Food and Beverages <sup>7</sup>	n/a	33.95	n/a
Lodging Expenses <sup>8</sup>	n/a	0.26	n/a

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.



# Southcentral Alaska Resident Angler Spending Profile

Fishing Site: Anchorage Area Lakes (L-1)  
Target Species: Rainbow Trout & Landlocked Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	1	22	3
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$35.00	\$3.19	\$62.00
Airplane	0	0	0
Boat	0	0.05	0
Other	300.00	0.05	0
Onsite Fishing <sup>6</sup>			
Consumable Tackle	0	1.67	55.00
Onsite boating costs	0	0.10	0
Guide fees	0	0	0
Food and Beverages <sup>7</sup>	100.00	3.57	50.00
Lodging Expenses <sup>8</sup>	100.00	0	6.00

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile\*

Fishing Site: Eastside Susitna Roadside Streams  
(M-2, M-3, M-4)

Target Species: King Salmon

	Kenai Anglers <sup>1</sup>	Anchorage Anglers <sup>2</sup>	Fairbanks Anglers <sup>3</sup>
Sample Size <sup>4</sup>	0	50	1
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	na	\$17.10	35.00
Airplane	na	0	0
Boat	na	3.56	0
Other	na	0.10	0
Onsite Fishing <sup>6</sup>			
Consumable Tackle	na	8.98	20.00
Onsite boating costs	na	0.60	0
Guide fees	na	0	0
Food and Beverages <sup>7</sup>	na	19.66	15.00
Lodging Expenses <sup>8</sup>	na	0.24	0

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile\*

Fishing Site: Eastside Susitna Roadside Streams  
(M2, M3, M4)  
Target Species: Silver Salmon

	Kenai <sup>1</sup> Anglers	Anchorage <sup>2</sup> Anglers	Fairbanks <sup>3</sup> Anglers
Sample Size <sup>4</sup>	0	18	1
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	na	\$17.11	30.00
Airplane	na	0	0
Boat	na	0	0
Other	na	0	0
Onsite Fishing <sup>6</sup>			
Consumable Tackle	na	11.00	25.00
Onsite boating costs	na	4.44	0
Guide fees	na	3.33	0
Food and Beverages <sup>7</sup>	na	19.61	50.00
Lodging Expenses <sup>8</sup>	na	1.11	12.00

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile \*

Fishing Site: Lake Creek (N-2)  
All Species

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	1	31	2
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$ 0	\$25.52	\$19.00
Airplane	40.00	65.81	0
Boat	0	12.61	1.50
Other	0	1.61	0
Onsite Fishing <sup>6</sup>			
Consumable Tackle	10.00	23.94	6.50
Onsite boating costs	0	4.52	0
Guide fees	0	0	0
Food and Beverages <sup>7</sup>	10.00	23.29	11.00
Lodging Expenses <sup>8</sup>	0	31.16	0

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile\*

Fishing Site: Lake Creek (N-2)  
Target Species: King Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	0	10	0
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	n/a	\$13.50	n/a
Airplane	n/a	58.00	n/a
Boat	n/a	19.60	n/a
Other	n/a	0	n/a
Onsite Fishing <sup>6</sup>			
Consumable Tackle	n/a	13.50	n/a
Onsite boating costs	n/a	10.50	n/a
Guide fees	n/a	0	n/a
Food and Beverages <sup>7</sup>	n/a	26.00	n/a
Lodging Expenses <sup>8</sup>	n/a	26.00	n/a

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

Southcentral Alaska Resident Angler Spending Profile \*

Fishing Site: Lake Creek (N-2)  
Target Species: Silver Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	1	7	0
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	0	\$72.67	n/a
Airplane	\$40.00	20.00	n/a
Boat	0	5.00	n/a
Other	0	0	n/a
Onsite Fishing <sup>6</sup>			
Consumable Tackle	10.00	50.17	n/a
Onsite boating costs	0	0.83	n/a
Guide fees	0	0	n/a
Food and Beverages <sup>7</sup>	10.00	12.50	n/a
Lodging Expenses <sup>8</sup>	0	0	n/a

Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile

Fishing Site: West Side Cook Inlet/West Side  
Susitna Streams (in part)\*\*  
Target Species: King Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	0	86	2
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	n/a	\$13.76	\$60.00
Airplane	n/a	60.56	0
Boat	n/a	10.04	35.00
Other	n/a	1.40	0
Onsite Fishing <sup>6</sup>			
Consumable Tackle	n/a	12.97	0
Onsite boating costs	n/a	2.22	0
Guide fees	n/a	2.21	50.00
Food and Beverages <sup>7</sup>	n/a	21.35	50.00
Lodging Expenses <sup>8</sup>	n/a	0.59	0

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

\*\* Includes Deshka River/Kroto Creek (N-1), Alexander Creek (N-3), Talachulitna River (N-4), Chuitna River (N-5), Theodore, Lewis, and Ivan Rivers (N-6).

# Southcentral Alaska Resident Angler Spending Profile

Fishing Site: West Side Cook Inlet/West Side  
Susitna Streams (in part)\*\*  
Target Species: Silver Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	0	14	1
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	n/a	\$10.10	\$20.00
Airplane	n/a	60.00	0
Boat	n/a	8.00	0
Other	n/a	2.50	0
Onsite Fishing <sup>6</sup>			
Consumable Tackle	n/a	155.50	45.00
Onsite boating costs	n/a	1.50	0
Guide fees	n/a	36.40	0
Food and Beverages <sup>7</sup>	n/a	23.10	10.00
Lodging Expenses <sup>8</sup>	n/a	10.00	0

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

\*\* Includes Deshka River/Kroto Creek (N-1), Alexander Creek (N-3), Talachulitna River (N-4), Chuitna River (N-5), Theodore, Lewis, and Ivan Rivers (N-6).



Southcentral Alaska Resident Angler Spending Profile \*

Fishing Site: Other Area N (West Side  
Cook Inlet/West Side Susitna)

Target Species: King Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	1	3	0
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	0	0	n/a
Airplane	0	\$70.00	n/a
Boat	0	0	n/a
Other	0	0	n/a
Onsite Fishing <sup>6</sup>			
Consumable Tackle	0	10.00	n/a
Onsite boating costs	0	0	n/a
Guide fees	0	0	n/a
Food and Beverages <sup>7</sup>	0	8.00	n/a
Lodging Expenses <sup>8</sup>	0	0	n/a

Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile \*

Fishing Site: Other Area N (West Side  
Cook Inlet/West Side Susitna)  
Target Species: Silver Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	4	15	0
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$ 2.33	\$11.75	n/a
Airplane	23.33	45.00	n/a
Boat	0	0	n/a
Other	0	0	n/a
Onsite Fishing <sup>6</sup>			
Consumable Tackle	5.00	4.00	n/a
Onsite boating costs	0	0	n/a
Guide fees	0	3.33	n/a
Food and Beverages <sup>7</sup>	4.33	19.17	n/a
Lodging Expenses <sup>8</sup>	0	0	n/a

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

Southcentral Alaska Resident Angler Spending Profile\*

Fishing Site: Kenai River (P-1)  
All Species

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	59	101	7
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$10.76	\$42.50	\$30.71
Airplane	0	7.51	0
Boat	6.61	14.70	0
Other	0.08	1.66	31.14
Onsite Fishing <sup>6</sup>			
Consumable Tackle	7.02	11.77	7.29
Onsite boating costs	6.27	8.03	2.86
Guide fees	1.69	30.64	105.29
Food and Beverages <sup>7</sup>	9.53	43.63	105.29
Lodging Expenses <sup>8</sup>	1.54	20.59	30.71

Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile\*

Fishing Site: Kenai River (P-1)  
Target Species: King Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	18	55	4
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$8.22	\$38.00	\$105.00
Airplane	0	7.08	0
Boat	4.06	9.17	0
Other	0	2.81	0
Onsite Fishing <sup>6</sup>			
Consumable Tackle	6.28	8.79	8.75
Onsite boating costs	4.22	9.79	5.00
Guide fees	0	39.58	141.25
Food and Beverages <sup>7</sup>	6.61	39.65	82.50
Lodging Expenses <sup>8</sup>	0.56	12.56	28.25

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile \*

Fishing Site: Kenai River (P-1)

Target Species: Silver Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	12	19	1
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$12.82	\$47.13	\$10.00
Airplane	0	0	0
Boat	1.18	5.80	0
Other	0	0.87	0
Onsite Fishing <sup>6</sup>			
Consumable Tackle	5.18	8.07	0
Onsite boating costs	0	2.00	0
Guide fees	0	16.67	0
Food and Beverages <sup>7</sup>	2.18	41.40	7.00
Lodging Expenses <sup>8</sup>	0	6.67	0

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile \*

Fishing Site: Kenai River (P-1)  
Target Species: Red Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	3	2	0
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$2.33	\$20.00	n/a
Airplane	0	50.00	n/a
Boat	0	0	n/a
Other	1.67	0	n/a
Onsite Fishing <sup>6</sup>			
Consumable Tackle	5.00	7.50	n/a
Onsite boating costs	0.67	0	n/a
Guide fees	0	0	n/a
Food and Beverages <sup>7</sup>	3.33	27.50	n/a
Lodging Expenses <sup>8</sup>	0	0	n/a

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile \*

Fishing Site: Kenai River (P-2, P-3, & P-4)

Target Species: King Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	5	28	1
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$10.75	\$41.36	\$100.00
Airplane	0	6.36	0
Boat	3.75	7.00	0
Other	0	5.68	0
Onsite Fishing <sup>6</sup>			
Consumable Tackle	3.75	8.18	0
Onsite boating costs	6.25	6.14	0
Guide fees	50.00	27.73	100.00
Food and Beverages <sup>7</sup>	6.25	38.27	150.00
Lodging Expenses <sup>8</sup>	0	8.77	12.00

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile\*

Fishing Site: Kenai River (P-2, P-3, & P-4)  
Target Species: Silver Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	9	22	2
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$2.50	\$38.11	0
Airplane	0	1.58	280.00
Boat	0.63	3.79	0
Other	0	0	110.00
Onsite Fishing <sup>6</sup>			
Consumable Tackle	2.88	8.16	30.00
Onsite boating costs	0	2.79	0
Guide fees	0	4.79	80.00
Food and Beverages <sup>7</sup>	2.25	25.68	60.00
Lodging Expenses <sup>8</sup>	0	1.32	85.00

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.



# Southcentral Alaska Resident Angler Spending Profile

Fishing Site: Kenai River (P-2, P-3, & P-4)  
Target Species: Red Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	5	35	1
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$ 8.20	\$30.71	0
Airplane	0	0	0
Boat	2.00	1.94	0
Other	0	1.19	0
Onsite Fishing <sup>6</sup>			
Consumable Tackle	2.80	7.94	0
Onsite boating costs	0	0.35	0
Guide fees	0	0	0
Food and Beverages <sup>7</sup>	5.80	25.06	0
Lodging Expenses <sup>8</sup>	0.40	4.52	0

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile\*

Fishing Site: Kenai River (P-2, P-3, & P-4)  
Target Species: Rainbow Trout

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	2	17	0
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$12.50	\$33.67	n/a
Airplane	0	0	n/a
Boat	10.00	3.67	n/a
Other	0	1.33	n/a
Onsite Fishing <sup>6</sup>			
Consumable Tackle	17.50	11.00	n/a
Onsite boating costs	15.00	0.33	n/a
Guide fees	0	0	n/a
Food and Beverages <sup>7</sup>	27.50	25.33	n/a
Lodging Expenses <sup>8</sup>	0	1.53	n/a

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile\*

Fishing Site: Russian River (P-7)  
Target Species: Red Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	7	65	5
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$12.50	\$27.36	\$82.00
Airplane	0	1.72	0
Boat	0	0.34	0
Other	0	2.93	34.00
Onsite Fishing <sup>6</sup>			
Consumable Tackle	4.50	8.90	70.00
Onsite boating costs	0	0.94	0
Guide fees	0	3.36	0
Food and Beverages <sup>7</sup>	5.67	19.79	81.00
Lodging Expenses <sup>8</sup>	0.83	5.36	15.80

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile\*

Fishing Site: Lower Kenai Peninsula Streams  
(P-9, P-10, P-11)

Target Species: All Species

	Kenai Anglers <sup>1</sup>	Anchorage Anglers <sup>2</sup>	Fairbanks Anglers <sup>3</sup>
Sample Size <sup>4</sup>	39	90	6
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$ 9.08	\$52.02	\$86.17
Airplane	0	1.48	0
Boat	0.77	2.70	16.67
Other	0	5.64	6.67
Onsite Fishing <sup>6</sup>			
Consumable Tackle	18.97	9.22	15.00
Onsite boating costs	0.08	1.39	3.33
Guide fees	0	1.33	15.00
Food and Beverages <sup>7</sup>	18.15	32.89	34.17
Lodging Expenses <sup>8</sup>	0	3.42	8.00

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

Southcentral Alaska Resident Angler Spending Profile\*

Fishing Site: Lower Kenai Peninsula Streams

(P-9, P-10, & P-11)

Target Species: King Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	16	40	3
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$14.00	\$45.83	\$100.00
Airplane	0	0.27	0
Boat	0	1.43	0
Other	0	0	0
Onsite Fishing <sup>6</sup>			
Consumable Tackle	46.43	9.10	20.00
Onsite boating costs	0	0.83	0
Guide fees	0	4.00	0
Food and Beverages <sup>7</sup>	33.79	33.33	40.00
Lodging Expenses <sup>8</sup>	0	1.03	0

Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile\*

Fishing Site: Deep Creek Marine (P-13)  
Target Species: King Salmon

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	7	17	1
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$25.33	\$60.67	\$17.00
Airplane	0	0	0
Boat	1.33	14.00	0
Other	0	0	0
Onsite Fishing <sup>6</sup>			
Consumable Tackle	12.17	16.67	5.00
Onsite boating costs	1.83	11.80	0
Guide fees	0	0	50.00
Food and Beverages <sup>7</sup>	15.00	70.67	30.00
Lodging Expenses <sup>8</sup>	0	1.67	48.00

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile\*

Fishing Site: Deep Creek Marine (P-13)  
Target Species: Halibut

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	16	24	2
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$17.27	\$39.00	\$87.50
Airplane	0	14.44	0
Boat	7.87	17.89	17.50
Other	0	5.56	0
Onsite Fishing <sup>6</sup>			
Consumable Tackle	12.40	12.72	12.50
Onsite boating costs	1.27	8.61	12.50
Guide fees	0	4.44	0
Food and Beverages <sup>7</sup>	13.20	34.56	37.50
Lodging Expenses <sup>8</sup>	0	0	0

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

Southcentral Alaska Resident Angler Spending Profile\*

Fishing Site: Kachemak Bay (P-14)  
Target Species: Halibut

	Kenai <sup>1</sup> Anglers	Anchorage <sup>2</sup> Anglers	Fairbanks <sup>3</sup> Anglers
Sample Size <sup>4</sup>	29	123	17
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$18.65	\$49.15	\$135.53
Airplane	0	13.32	0
Boat	20.19	27.18	70.38
Other	0.19	5.22	3.07
Onsite Fishing <sup>6</sup>			
Consumable Tackle	7.15	9.99	10.77
Onsite boating costs	7.73	33.76	53.69
Guide fees	12.69	64.46	11.15
Food and Beverages <sup>7</sup>	23.81	44.08	74.23
Lodging Expenses <sup>8</sup>	0.46	22.67	18.38

Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.



# Southcentral Alaska Resident Angler Spending Profile\*

Fishing Site: Resurrection Bay  
(P-15) and Other Saltwater (P-18)  
Target Species: Silver Salmon

	Kenai Anglers <sup>1</sup>	Anchorage Anglers <sup>2</sup>	Fairbanks Anglers <sup>3</sup>
Sample Size <sup>4</sup>	8	25	0
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$11.38	\$29.48	na
Airplane	0	2.00	na
Boat	15.63	12.40	na
Other	0	0.20	na
Onsite Fishing <sup>6</sup>			
Consumable Tackle	16.25	8.24	na
Onsite boating costs	0.63	11.92	na
Guide fees	12.50	1.32	na
Food and Beverages <sup>7</sup>	12.13	56.88	na
Lodging Expenses <sup>8</sup>	1.63	14.32	na

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

# Southcentral Alaska Resident Angler Spending Profile\*

Fishing Site: Resurrection Bay (P-15) and Other Saltwater (P-18)

Target Species: Halibut

	Kenai Peninsula Anglers <sup>1</sup>	Anchorage Area Anglers <sup>2</sup>	Fairbanks Area Anglers <sup>3</sup>
Sample Size <sup>4</sup>	8	39	6
<u>Expenses Category</u>			
Transportation <sup>5</sup>			
Motor Vehicle	\$16.17	\$41.52	\$55.00
Airplane	0	1.82	0
Boat	42.17	12.12	33.33
Other	0	10.73	0
Onsite Fishing <sup>6</sup>			
Consumable Tackle	5.00	10.76	3.33
Onsite boating costs	4.17	18.88	1.33
Guide fees	0	23.94	25.00
Food and Beverages <sup>7</sup>	12.17	38.48	50.83
Lodging Expenses <sup>8</sup>	0.67	7.85	21.67

## Notes:

1. Origin zone numbers 1 through 6.
2. Origin zone numbers 7 through 15.
3. Origin zone number 16.
4. Number of households by site for which site-specific spending was revealed, and for which only this target species was named for this site.
5. Transportation expenses to and from the site, per trip, per household.
6. Onsite fishing expenses, per day, per household.
7. Food and beverage expenses, per day, per household.
8. Lodging expenses, per day, per household.

\* Estimates calculated for each category using all reported values (including zeros) from the sample.

NONRESIDENT ANGLER SPENDING  
PROFILES

Southcentral Alaska Nonresident Angler Spending Profile  
All Species, All Southcentral Sites (Areas I-P)

---

Expenses Category	Dollars Spent per Household Fishing Day
Package fishing tour	\$ 46.52
Guiding fees	16.06
Transportation within Alaska	25.37
Fishing-related clothing	7.39
Tackle/fishing gear/equipment rental	10.97
Food and beverages	33.04
Lodging/camping fees	15.57
Fish processing/packaging/bait	6.44
Other fishing-related expenses	<u>7.12</u>
Total	\$168.48

---

\* Sample size: 258

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

---

Southcentral Alaska Nonresident Angler Spending Profile  
King Salmon/Small King Salmon (Areas I-P)

---

Expenses Category	Dollars Spent per Household Fishing Day
<hr/>	
Package fishing tour	\$ 68.00
Guiding fees	15.69
Transportation within Alaska	30.97
Fishing-related clothing	6.15
Tackle/fishing gear/equipment rental	9.45
Food and beverages	33.49
Lodging/camping fees	16.89
Fish processing/packaging/bait	6.62
Other fishing-related expenses	<u>5.80</u>
Total	\$193.06

---

\* Sample size: 119

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

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Southcentral Alaska Nonresident Angler Spending Profile  
Halibut (All Sites)

---

Expenses Category	Dollars Spent per Household Fishing Day
<hr/>	
Package fishing tour	\$ 34.91
Guiding fees	10.98
Transportation within Alaska	20.23
Fishing-related clothing	7.52
Tackle/fishing gear/equipment rental	10.18
Food and beverages	32.71
Lodging/camping fees	19.39
Fish processing/packaging/bait	9.33
Other fishing-related expenses	<u>3.49</u>
Total	\$148.74

---

\* Sample size: 53

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

---

Southcentral Alaska Nonresident Angler Spending Profile  
Razor Clams (All Sites)

Expenses Category	Dollars Spent per Household Fishing Day
Package fishing tour	\$ 3.21
Guiding fees	0
Transportation within Alaska	16.07
Fishing-related clothing	0
Tackle/fishing gear/equipment rental	12.15
Food and beverages	37.30
Lodging/camping fees	11.00
Fish processing/packaging/bait	0.95
Other fishing-related expenses	<u>4.76</u>
Total	\$85.44

\* Sample size: 3

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

Southcentral Alaska Nonresident Angler Spending Profile  
Glennallen Area (I-1 through I-5)

Expenses Category	Dollars Spent per Household Fishing Day
Package fishing tour	\$ 11.43
Guiding fees	13.33
Transportation within Alaska	30.34
Fishing-related clothing	5.82
Tackle/fishing gear/equipment rental	5.48
Food and beverages	36.60
Lodging/camping -fees	21.18
Fish processing/packaging/bait	6.09
Other fishing-related expenses	<u>0.15</u>
Total	\$130.42

\* Sample size: 10

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.



Southcentral Alaska Nonresident Angler Spending Profile  
Prince William Sound (J-1 through J-4)

---

Expenses Category	Dollars Spent per Household Fishing Day
<hr/>	
Package fishing tour	\$ 6.44
Guiding fees	30.48
Transportation within Alaska	42.34
Fishing-related clothing	10.28
Tackle/fishing gear/equipment rental	7.94
Food and beverages	35.31
Lodging/camping fees	23.34
Fish processing/packaging/bait	2.22
Other fishing-related expenses	<u>6.87</u>
Total	\$165.22

---

\* Sample size: 21

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

---

Southcentral Alaska Nonresident Angler Spending Profile  
Little Susitna River (K-1)

---

Expenses Category	Dollars Spent per Household Fishing Day
Package fishing tour	\$ 2.98
Guiding fees	9.29
Transportation within Alaska	14.76
Fishing-related clothing	2.86
Tackle/fishing gear/equipment rental	4.46
Food and beverages	20.61
Lodging/camping fees	4.29
Fish processing/packaging/bait	2.23
Other fishing-related expenses	<u>0.24</u>
Total	\$61.72

---

\* Sample size: 7

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

---

Southcentral Alaska Nonresident Angler Spending Profile  
Other Knik Arm Drainage (K-2 through K-9)

Expenses Category	Dollars Spent per Household Fishing Day
Package fishing tour	\$ 3.13
Guiding fees	0
Transportation within Alaska	55.83
Fishing-related clothing	0
Tackle/fishing gear/equipment rental	6.36
Food and beverages	48.65
Lodging/camping fees	5.00
Fish processing/packaging/bait	0.78
Other fishing-related expenses	<u>0</u>
Total	\$119.75

\* Sample size: 4

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

Southcentral Alaska Nonresident Angler Spending Profile  
Anchorage Area (L-1 through L-6)

---

Expenses Category	Dollars Spent per Household Fishing Day
Package fishing tour	\$ 3.00
Guiding fees	2.00
Transportation within Alaska	21.83
Fishing-related clothing	5.33
Tackle/fishing gear/equipment rental	20.50
Food and beverages	35.00
Lodging/camping fees	0.50
Fish processing/packaging/bait	1.83
Other fishing-related expenses	<u>22.17</u>
Total	\$112.16

---

\* Sample size: 10

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

---

Southcentral Alaska Nonresident Angler Spending Profile  
East Side Susitna Roadside Streams -  
in part (M-2, M-3, M-4)

---

Expenses Category	Dollars Spent per Household Fishing Day
Package fishing tour	\$ 1.19
Guiding fees	3.78
Transportation within Alaska	19.49
Fishing-related clothing	4.76
Tackle/fishing gear/equipment rental	17.07
Food and beverages	18.16
Lodging/camping fees	15.75
Fish processing/packaging/bait	1.41
Other fishing-related expenses	<u>4.08</u>
Total.	\$85.69

---

\* Sample size: 7

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

---

Southcentral Alaska Nonresident Angler Spending Profile  
Other East Side/West Side Cook Inlet -  
Susitna Area (M-1, M-5, N-7, N-8)

---

Expenses Category	Dollars Spent per Household Fishing Day
<hr/>	
Package fishing tour	\$240.74
Guiding fees	3.38
Transportation within Alaska	14.60
Fishing-related clothing	12.78
Tackle/fishing gear/equipment rental	6.79
Food and beverages	9.33
Lodging/camping fees	1.24
Fish processing/packaging/bait	10.16
Other fishing-related expenses	<u>8.15</u>
Total	\$307.17

---

\* Sample size: 9

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

---

Southcentral Alaska Nonresident Angler Spending Profile  
 West Side Cook Inlet/West Side Susitna Streams -  
 in part (N-1 through N-6)

Expenses Category	Dollars Spent per Household Fishing Day
Package fishing tour	\$ 18.83
Guiding fees	18.96
Transportation within Alaska	45.42
Fishing-related clothing	12.50
Tackle/fishing gear/equipment rental	11.25
Food and beverages	46.94
Lodging/camping fees	23.25
Fish processing/packaging/bait	6.67
Other fishing-related expenses	<u>15.31</u>
Total	\$199.13

\* Sample size: 8

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

Southcentral Alaska Nonresident Angler Spending Profile  
Kenai River - lower (P-1)

---

Expenses Category	Dollars Spent per Household Fishing Day
Package fishing tour	\$ 55.26
Guiding fees	38.15
Transportation within Alaska	25.61
Fishing-related clothing	8.37
Tackle/fishing gear/equipment rental	12.57
Food and beverages	45.41
Lodging/camping fees	19.06
Fish processing/packaging/bait	7.19
Other fishing-related expenses	<u>11.95</u>
Total	\$223.57

---

\* Sample size: 28

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

---



Southcentral Alaska Nonresident Angler Spending Profile  
Kenai River - other (P-2, P-3, P-4)

---

Expenses Category	Dollars Spent per Household Fishing Day
Package fishing tour	\$ 46.79
Guiding fees	12.00
Transportation within Alaska	25.15
Fishing-related clothing	4.48
Tackle/fishing gear/equipment rental	8.09
Food and beverages	35.68
Lodging/camping fees	9.62
Fish processing/packaging/bait	8.87
Other fishing-related expenses	<u>12.49</u>
Total	\$163.17

---

\* Sample size: 41

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

---

Southcentral Alaska Nonresident Angler Spending Profile  
Russian River (P-7)

---

Expenses Category	Dollars Spent per Household Fishing Day
<hr/>	
Package fishing tour	0
Guiding fees	\$ 7.18
Transportation within Alaska	16.84
Fishing-related clothing	3.19
Tackle/fishing gear/equipment rental	2.80
Food and beverages	7.99
Lodging/camping fees	2.82
Fish processing/packaging/bait	0.09
Other fishing-related expenses	<u>0</u>
Total	\$40.91

---

\* Sample size: 6

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

---

Southcentral Alaska Nonresident Angler Spending Profile  
Kenai Peninsula - other freshwater (P-5, P-6, P-8, P-12)

---

Expenses Category	Dollars Spent per Household Fishing Day
Package fishing tour	\$117.30
Guiding fees	0
Transportation within Alaska	23.61
Fishing-related clothing	12.71
Tackle/fishing gear/equipment rental	24.28
Food and beverages	19.17
Lodging/camping fees	13.85
Fish processing/packaging/bait	3.84
Other fishing-related expenses	<u>2.99</u>
Total	\$217.75

---

\* Sample size: 12

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

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Southcentral Alaska Nonresident Angler Spending Profile  
Lower Kenai Peninsula Streams (P-9, P-10, P-11)

---

Expenses Category	Dollars Spent per Household Fishing Day
<hr/>	
Package fishing tour	\$ 2.49
Guiding fees	2.09
Transportation within Alaska	26.72
Fishing-related clothing	8.30
Tackle/fishing gear/equipment rental	12.66
Food and beverages	18.04
Lodging/camping fees	14.08
Fish processing/packaging/bait	5.02
Other fishing-related expenses	<u>0.65</u>
Total	\$90.05

---

\* Sample size: 17

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

---

Southcentral Alaska Nonresident Angler Spending Profile  
Deep Creek Marine (P-13)

---

Expenses Category	Dollars Spent per Household Fishing Day
<hr/>	
Package fishing tour	\$ 37.94
Guiding fees	15.04
Transportation within Alaska	10.71
Fishing-related clothing	5.33
Tackle/fishing gear/equipment rental	13.69
Food and beverages	31.98
Lodging/camping fees	10.00
Fish processing/packaging/bait	10.49
Other fishing-related expenses	<u>0.34</u>
Total	\$135.52

---

\* Sample size: 9

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

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Southcentral Alaska Nonresident Angler Spending Profile  
Kachemak Bay (P-14)

---

Expenses Category	Dollars Spent per Household Fishing Day
<hr/>	
Package fishing tour	\$ 49.74
Guiding fees	10.35
Transportation within Alaska	32.29
Fishing-related clothing	6.71
Tackle/fishing gear/equipment rental	10.05
Food and beverages	28.96
Lodging/camping fees	21.08
Fish processing/packaging/bait	9.60
Other fishing-related expenses	<u>2.28</u>
Total	\$171.06

---

\* Sample size: 34

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

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Southcentral Alaska Nonresident Angler Spending Profile  
Resurrection Bay and other saltwater (P-15, P-18)

---

Expenses Category	Dollars Spent per Household Fishing Day
Package fishing tour	\$172.98
Guiding fees	6.15
Transportation within Alaska	12.72
Fishing-related clothing	20.85
Tackle/fishing gear/equipment rental	10.85
Food and beverages	60.08
Lodging/camping fees	30.99
Fish processing/packaging/bait	2.67
Other fishing-related expenses	<u>12.82</u>
Total	\$330.11

---

\* Sample size: 13

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

---

Southcentral Alaska Nonresident Angler Spending Profile  
Kenai Peninsula - Shoreline (P-16, P-17)

---

Expenses Category	Dollars Spent per Household Fishing Day
Package fishing tour	\$ 4.33
Guiding fees	0
Transportation within Alaska	14.14
Fishing-related clothing	0.96
Tackle/fishing gear/equipment rental	8.66
Food and beverages	33.01
Lodging/camping fees	1.11
Fish processing/packaging/bait	2.88
Other fishing-related expenses	<u>1.60</u>
Total	\$66.69

---

\* Sample size: 4

Note: Estimates calculated for each category using all reported values (including zeros) from the sample.

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B-60

## Appendix C

### DETAILS OF THE STATISTICAL MODEL

The Generalized Logit model of summer sport fishing by Alaskan residents is based on a random utility maximization model with the following structure. Let  $U_{nt}$  denote an individual's welfare in week  $t$  conditional on not going fishing that week, let  $U_{1rst}$  denote an individual utility during week  $t$  conditional on his making one fishing trip that week for subspecies  $r$  of macrospecies  $s$  at site  $i$ ; let  $U_{2rst}$  denote an individual's utility conditional on fishing for subspecies  $r$  of macrospecies  $s$  at site  $i$  when making two fishing trips during week  $t$ , and let  $U_{3rst}$  denote his utility when making three or more trips during week  $t$ . More compactly, we will denote these latter terms by  $U_{Tirst}$ ,  $T=1, 2$ , or  $3$ . Given the random utility maximization hypothesis, the probability that the individual makes any fishing trips during week  $t$  is given by:

$$\Pr \{ \max_{Tirs} U_{Tirst} \geq U_{nt} \}$$

the probability that he selects, for example macrospecies  $S'$  as his target species when making a fishing trip during week  $t$  is given by:

$$\Pr \{ \max_{it} U_{Tirs'} \geq \max_{its} U_{Tirs} \}$$

and the probability that he selects site  $j$  when going fishing for subspecies  $r$  of macrospecies  $s$  during week  $t$  is given by:

$$\Pr \{ U_{Tjrs} = \max_i U_{Tirs} \}.$$

The random utilities are specified here as being the sum of a deterministic component ( $V_{Tirst}$ ) and a stochastic component ( $\epsilon_{Tirst}$ ), the latter representing variation in preferences among individuals and/or unobserved attributes either of the individual or of the choice alternatives.

$$U_{Tirst} = V_{Tirst} + \epsilon_{Tirst}$$

The random terms have a Generalized Extreme Value Distribution with cumulative distribution functions.

$$F(\epsilon_{Nt}, \epsilon_{1111t}, \dots, \epsilon_{3N_{ts}R_s4t}) = e^{-G(e^{-\epsilon_{Nt}}, e^{-\epsilon_{1111t}}, \dots, e^{-\epsilon_{3N_{ts}R_s4t}})} \quad (2)$$

where  $G(\cdot)$  has the following structure, corresponding to the four levels of nesting in Figure 9-1:

$$G(\cdot) = \epsilon_{Nt} + \sum_T a_T \left( \sum_s \left( \sum_{r \in R_s} \left( \sum_{t \in N_{ts}} \epsilon_{Tfirst} \frac{1}{1-\sigma_{rs}} \right)^{\frac{1-\sigma_{rs}}{1-\sigma_s}} \right)^{\frac{1-\sigma_s}{1-\sigma_T}} \right)^{1-\sigma_T} \quad (3)$$

Furthermore, the deterministic components have the following structure:

$$V_{Nt} = 0 \quad (4a)$$

$$V_{Tfirst} = W_T + \bar{\gamma}_s + \bar{\eta}_s \text{ Income} + \bar{\alpha}_{rs} + \bar{W}_{first} \quad (4b)$$

In terms of the formulas used in Chapter 8, equations (7), (8), (9), (12), and (16)

$$W_{first} \equiv \frac{\bar{W}_{first}}{(1-\sigma_{rs})} \quad (5a)$$

$$\alpha_{rs} \equiv \frac{\bar{\alpha}_{rs}}{1-\sigma_s} \quad \delta_{rs} \equiv \frac{(1-\sigma_{rs})}{(1-\sigma_s)} \quad (5b)$$

$$\gamma_s \equiv \frac{\bar{\gamma}_s}{1-\sigma_T} \quad \eta_s \equiv \frac{\bar{\eta}_s}{1-\sigma_T} \quad \sigma_s \equiv \frac{1-\sigma_s}{1-\sigma_T} \quad (5c)$$

$$\beta_{Ts} = (1-\sigma_T). \quad (5d)$$

Following McFadden (1978), it can be proved that this specification of the random utility model generates the choice probability from equations (6), (9), (11), and (15) in Chapter 8.

It follows that the coefficients in the last 2 columns of Table 8-9 are (time-varying) estimates of  $(1-\sigma_T)$ ; the coefficients in Table 8-8 are estimates of:

$\frac{\bar{Y}_S}{1-\sigma_T}$ ,  $\frac{\bar{n}_S}{1-\sigma_T}$ , and  $\frac{(1-\sigma_S)}{1-\sigma_T}$ ; the coefficients in Table 8-7 are

estimates of  $\frac{\alpha_{rs}}{1-\sigma_S}$  and  $\frac{(1-\sigma_{rs})}{1-\sigma_S}$  while the coefficients in Table

8-6 are estimates of  $\frac{\bar{W}_{first}}{(1-\sigma_{rs})}$

Thus, multiplying the coefficients in Table 8-8 by the estimate of  $1-\sigma_T$  obtained from Table 8-9 yields estimates of  $\bar{Y}_S$ ,  $\bar{n}_S$  and  $(1-\sigma_S)$ . Similarly, using this estimate of  $(1-\sigma_S)$  and multiplying it by the coefficients in Table 8-7 yields estimates of  $\alpha_{rs}$  and  $(1-\sigma_{rs})$ . Finally, multiplying the estimates in Table 8-6 by this estimate of  $(1-\sigma_{rs})$  yields estimates of the coefficients in the term  $\bar{W}_{first}$ .