Estimating Net Benefits of Non-Resident Fishing in Alaska

Working Draft

by

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Economic Impacts and Net Benefits of Non-Resident Fishing in Alaska

Introduction

Nonresident sport fishing in Alaska has been growing at a much faster rate than resident sport fishing. Between 1983 and 1994, nonresident anglers more than doubled in number while numbers of resident anglers changed little.(ISER, 1996, p.II-8) Tensions have grown along with competition for the most popular fishing sites. The Kenai River is the most popular fishing site for residents and nonresidents alike. Of the 56,000 households fishing the River in 1993, 43 percent were resident and 57 percent nonresident. (ISER, 1996, Table C-1) Management strategies to mitigate conflict over Alaska fisheries need to consider the fishing patterns of nonresidents and the benefits nonresidents bring.

This paper reports survey results describing nonresident fishing in Alaska and estimation results of a behavioral model of nonresident fishing. The model is used to analyze the effects of a hypothetical management change on nonresident fishing. Model projections are compared to a similar analysis for resident anglers. Conclusions describe the elasticities of resident and nonresident response to changes in fishing quality, the economic impact of nonresident versus resident fishing, and the untapped willingness to pay of nonresident anglers for fishing in Alaska.

Travel Cost Method

The travel cost method is a standard technique for estimating anglers' net benefits from fishing and analyzing how their fishing decisions might change as conditions

change. This method uses observed choices anglers make about where to fish to infer the values anglers assign to various site characteristics. The set of alternative sites available to the angler are described by data on fishing quality, site amenities and the costs of traveling and fishing there. Anglers trade off expected benefits with costs for each site, choosing the site that offers the greatest benefit net of costs. With this information we statistically estimate the probability that an angler will choose a site, given the characteristics of that site compared to the alternatives. The estimated equations are used to project how the number of visits to each site might change as expected fishing conditions change. We can also use the estimated trade off between costs measured in dollars and site characteristics to value in dollars each characteristic and the value of sites they characterize. The estimated measure of value is "willingness to pay" (WTP) for the fishing qualities and site amenities measured.

A discrete choice model is used to estimate the probability (P_{it}) that an angler selects site *i* in month *t*: $P_{it} = \frac{e^{x_{it}b}}{\sum_{i=1}^{N} e^{x_{it}b}}$

The term $X_{it}b$ is a linear combination of the independent variables-- including costs and fishing qualities-- and their coefficients. A change in willingness to pay may be calculated from the equation as: $dWTP = \frac{I - I'}{b_1}$

where b_1 is the (negative) coefficient on the cost variable and I and I' are the *inclusive value* under the base case and alternative scenario: $I = \ln\left[\sum e^{x_{it}b}\right]$

Data

Nine hundred seventy two anglers-- 61 percent-- responded to a mail survey sent to a sample of non-resident sport fishing license holders for 1993. The lengthy survey asked about fishing activities and expenditures on their household's most recent trip to Alaska. The finished data set included information on 1678 fishing trips, with an average of 1.71 anglers and 2.60 days per trip. The only time-information we gathered was the month they came.

We divided the anglers into three types and estimated separate models for each. Destination anglers we defined as those who said the main purpose of their trip was fishing, they did not come for business or visiting friends, they would not have come if they couldn't have fished, and they didn't use a private vehicle. The remaining "incidental" anglers were divided by the reported origin of their trip: the Southeast panhandle, or anywhere in the rest of the state, including Southcentral, Interior and remote regions of Alaska.

Destination anglers were in state an average of 9.8 days, of which they fished 7. Incidental anglers in Southeast were in state an average of 15.2 days, of which they fished 3.4. Incidental anglers in the rest of the state fished about 6.4 days total out of an average 28 days in state. Southcentral incidental anglers are more likely to use a private vehicle (57%). Destination anglers report higher levels of fishing skills. Destination anglers and Southeast anglers were more likely to be on a package tour, more likely to be on a guided

trip, and higher income on average than Southcentral and other anglers ($119,800 and $111,100 compared to $72,394).

Each type of angler had a different choice set of fishing sites. Fishing sites statewide were grouped into 30 alternatives for destination anglers, 20 alternatives for Southeast incidental anglers, and 31 alternatives for Southcentral, interior and remote incidental anglers. The site definitions for each group and the distributions of trips by site are reported in Table 1.

The cost variable associated with each alternative fishing trip was problematic. The mail survey, conducted months after the trip was over, did not elicit a consistent definition of a trip, consistent accounting of trip costs, or even accurate recall of place names; for the subtle and complex information we wanted, the surveys should have been conducted by telephone. Efforts to estimate tobit equations explaining either components of cost or total costs failed, because zero reported costs did not mean zero costs; it meant that our survey questions did not elicit the information we wanted. In the end we used a linear regression estimated from anglers who reported nonzero expenses to estimate trip costs for all anglers and all alternatives. Even with this restricted domain, our regression explained less than a third of the variation in reported costs. The dependent variable was total trip related costs-- guide and charter expenses, any included food and lodging, bait, tackle and fish processing expenses-- per angler day. The independent variables included both site and angler characteristics. The equation and variable definitions are shown in Table 2.

Travel costs from the (in-state) origin to the fishing site were estimated from a previously developed matrix of road miles and air and boat hours, using average vehicle miles per gallon or gallons per hour, plus gas prices at the origin. For destination anglers, commercial air fares from Seattle to their point of entry to Alaska were added to the travel costs for the first reported trip. When entered separately, the constructed travel costs had larger (negative) coefficients and were more significant than the estimated trip costs. For estimating the final equation, however, we added the two together as total costs in order to have one estimate of the marginal utility of income (b_1) used in the *dWTP* equation above. We also needed to represent all costs in order to estimate net benefits.

Using Alaska Department of Fish and Game (ADF&G) harvest survey data, ADF&G brochures, sport fishing regulations, and fishing reports in several local newspapers, we coded a variety of fishing quality variables by species, site and week. We used key informants to code a dummy variable representing crowding on the fishing grounds ("combat fishing") by site and week. We then aggregated the variables by month to match the time dimension in the survey data.

Estimation Results

Our estimated site choice equations are reported in Table 3, and the variable definitions follow. The variables in the first equation explain about 28 percent of the variance in site choice by destination anglers. Total cost and travel time explain much more of the level and variance in the probability of choosing a site than any of the species variables; crowding explains the least. The equation for Southeast incidental anglers is

better, explaining about 47 percent of the variance in site choice. For these anglers, total cost is the most powerful explanatory variable, and travel time is less important than either trout harvest or king catch per unit effort. Cost is even more powerful for those Southeast anglers who said not having to spend a lot of money to get to the fishing site was important. The third equation for Southcentral, Interior and remote incidental anglers explains about 24 percent of the variance, with travel time the most important explanatory variable and total cost and the species variables lagging.

Modeling a Policy Change

To exercise the model we analyzed a change in the management of Kenai River sockeye salmon that would put 221,000 more sockeye into the river at the peak of the run in the last two weeks of July. We chose this scenario because it matches a scenario in a published analysis for resident anglers (ISER,1995) and thus the results can readily be compared. This scenario affects only destination and Southcentral, Interior and remote incidental anglers; in our data set, none of the Southeast origin anglers reported fishing in the Kenai River.

More sockeye in the river would increase sockeye sport catch rates (REDDF). Since king salmon is bycatch for the commercial fishing fleet targeting sockeye, reducing the commercial harvest of sockeye would also put more kings into the river; the sport harvest of king salmon (KING) and catch rates for king salmon (KINGDF) would also increase slightly. Management biologists estimated that 221,000 more sockeye in the river in a year with a mid-size run would result in an increased sport harvest of about

44,800 sockeye. They estimate that an additional 530 kings would be harvested by sport anglers. These improvements in fishing quality would attract more anglers, so the increase in catch per angler day is moderated somewhat. We used the results of the resident model to project a 5.2 percent increase in angler days.

With these three variables changed for the Kenai River in the month of July, the non-resident model predicts a 4.6 percent increase in trips to the Kenai by destination anglers, and a 2.8 percent increase by incidental anglers. In our site choice model, the increase in trips to the Kenai River reduce trips to all other sites one for one. If we had data to analyze non-residents' choices about how many fishing trips to take, we would expect to find an increase in total fishing trips, such that the reduction in trips to other sites is less than one for one.

Each of the site alternatives represents a different pattern of trip and travel costs. As the mix of trips changes, so do the total expenditures on fishing. Kenai River fishing tends to be less expensive than the alternatives, so total expenditures on fishing will decline. In this case, however the effect is negligible-- less than one percent. Even the distributional effects are small: while expenditures on Kenai River trips might increase as much as 4%, most of these expenditures shift from other Kenai sites, so the net increase for Kenai is less than one percent, and corresponding decrease for other regions is less than one percent.

The estimated change in net benefits is more substantial. The model projects an increase in net willingness to pay per household of $400 for destination anglers and $550

for incidental anglers. Anglers already fishing the Kenai River and those for whom Kenai River fishing is a close substitute-- particularly anglers with Kenai origins-- benefit the most. Incidental anglers benefit more than destination anglers because proportionately more of them fish the Kenai River and other Kenai sites.

Comparison with Residents

Table 4 compares the model results for nonresidents to previously published results for residents. (ISER, 1996) For this comparison only Southcentral trips or origins were used. While the base trips for residents and nonresidents are quite similar, under the policy change the change in trips for nonresidents is much less elastic-- about one fourth. At the same time, the estimated willingness to pay per household for this improvement in Kenai River fishing is more than an order of magnitude higher for nonresidents than the estimates of for resident households in Southcentral Alaska. While the direction of difference is expected, the magnitude of the difference may be exaggerated. Non-resident anglers would be expected to have higher WTP because their demand is less elastic, they have higher incomes and to a greater extent self-select for their interest in fishing. The difference maybe exaggerated, however, by differences in the measures of fishing cost: the resident model had more detailed and more inclusive estimates of cost, and included the value of lost work time. Another difference is that the resident model allows new trips, meaning that marginal anglers are included in the net benefits estimate. The resident model also excluded anglers from the interior who fish in Southcentral.

Conclusions

While the reasons for these results need to be further explored, some conclusions are clear. First, nonresidents are less flexible in their choice of fishing sites, and in the short run less responsive to policy changes. Second, nonresident expenditures are more elastic than resident expenditures and the economic impact of nonresident spending is large. Third and fourth, nonresidents' large willingness to pay for Alaska fishing has two implications: there is undeveloped potential for additional spending by nonresident anglers; and a cost-benefit analysis for fishery management using a national accounting frame, counting benefits to nonresident anglers, would have quite different results than a state accounting frame.

References:

Institute of Social and Economic Research, *Economic Effects of Management Changes for Kenai River Late Run Sockeye*, prepared for Alaska Department of Fish and Game, January 1996.

Table 1a: Fishing Sites and Trips for Destination Anglers

Code	Site	Trips
158	Ketchikan Area	20.00
255	Prince of Wales Area Fresh	4.00
258	Prince of Wales Area Salt	14.00
404	Sitka Sound	8.00
458	Other Sitka Area	16.00
555	Juneau Area Fresh	5.00
558	Juneau Area Salt	20.00
758	Glacier Bay	3.00
855	Yakutat Area Fresh	8.00
858	Yakutat Area Salt	4.00
955	Glennallen Area Fresh	6.00
1058	Prince William Sound	7.00
1255	Anchorage and Mat-Su Area Fresh	3.00
1355	E. Susitna Area Fresh	3.00
1459	W. Susitna Area	33.00
1501	Anchor River, Deep Ck. & Whiskey Gulch	7.00
1505	Kechemak Bay	29.00
1506	Resurrection Bay	9.00
1507	Lower Cook Inlet & Outer Gulf	22.00
1513	Kasilof River	9.00
1524	Russian River	12.00
1542	Kenai River	67.00
1555	Other Kenai Fresh	8.00
1558	Other Kenai Salt	15.00
1655	Kodiak Fresh	6.00
1658	Kodiak Salt	14.00
1755	Area R (Ak. Penn)	11.00
1855	Area S	38.00
1955	Area T	18.00
5059	North, west and interior Alaska	6.00
Total		425.00

Table 1b: Fishing Sites and Trips for Southeast Incidental Anglers

Code	Site	Trips
104	Tongass Narrows	3.00
155	Ketchikan Area Fresh	4.00
158	Other Ketchikan Area Salt	102.00
259	Prince of Wales Area	5.00
359	Wrangell and Petersburg Area	2.00
404	Sitka Sound	32.00
455	Sitka Area Fresh	3.00
458	Other Sitka Area Salt	24.00
555	Juneau Area Fresh	5.00
558	Juneau Area Salt	72.00
601	Skagway Area Salt	5.00
602	Haines Area Salt	12.00
605	Chilkoot Lake	6.00
606	Chilkoot River	12.00
655	Other Haines & Skagway Area Fresh	3.00
701	Icy Straits	4.00
702	Glacier Bay	4.00
855	Yakutat Area Fresh	6.00
858	Yakutat Area Salt	4.00
5059	Other Alaska	4.00
Total		312.00

Table 1c: Fishing Sites and Trips for Southcentral and Other Incidental Anglers

Code	Site Label	Trips
559	Southeast Alaska	13.00
956	Glennallen Rivers and Streams	9.00
957	Glennallen Lakes	22.00
1058	Prince William Sound	45.00
1155	Mat-Su Area	28.00
1220	Bird Creek	5.00
1255	Other Anchorage Area Lakes and Streams	15.00
1307	Talkeetna River and Tributaries	8.00
1308	Sheep Creek	3.00
1355	Other E. Susitna Area Lakes and Streams	21.00
1459	W. Sustina and W. Cook Inlet	12.00
1501	Anchor River, Deep Ck. & Whiskey Gulch	29.00
1505	Kechemak Bay	118.00
1506	Resurrection Bay	76.00
1507	Lower Cook Inlet and Outer Gulf	36.00
1513	Kasilof River	17.00
1514	Anchor River	10.00
1524	Russian River	33.00
1527	Resurrection Creek	5.00
1542	Kenai River	240.00
1555	Other Kenai Fresh	54.00
1558	Other Kenai Salt	25.00
1655	Kodiak Fresh	5.00
1658	Kodiak Salt	9.00
1707	Naknek River and Tributaries	6.00
1710	Brooks River	5.00
1755	Other Area R	9.00
1855	Area S	7.00
1955	Area T	7.00
2055	Area U (Fairbanks)	50.00
5059	Other Northern and Western Alaska	19.00
Total		941.00

Table 2: Cost Equation for All Anglers

TRIPPAD = DESTANG * 73.60 + LINCOM * 48.95 + LNANGL * -35.31 + LNDAYS * -35.83
+ SITE258 * 117.5 + SITE1710 * 905.0 + SITE1755 * 162.1 + KINGDF * 97.93
+ HALDF * 35.39 + BTROUT * -4.9914 + BHALIBUT * -27.773

Variable	Definition
TRIPPAD	Guide and charter expenses, any included food and lodging, and bait, tackle and fish processing expenses, divided by angler days.
DESTANG	Coded 1 for destination anglers, 0 otherwise.
LINCOM	Log of income (in thousands).
LNANGL	Log of the number of anglers on the fishing trip.
LNDAYS	Log of the number of days the fishing trip lasted.
SITE258	Coded 1 for Prince of Wales Island salt water-- site of the Waterfall Bay Resort.
SITE1710	Coded 1 for the Brooks River-- site of the Brooks Camp Lodge in Katmai.
SITE1755	Coded 1 for other Area R fresh water-- several lodges are in the area.
KINGDF	Total 1992 king catch for the site divided by total angler days, set to 0 for weeks that king are not available or the fishery is closed.
HALDF	Total 1992 halibut catch for the site divided by total angler days, set to 0 for weeks that halibut are not available or the fishery is closed.
BTROUT	Bag limit for trout.
BHALIBUT	Bag limit for halibut.

Table 3a: Site Choice Equation for Destination Anglers

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Discrete Choice Model
Maximum Likelihood Estimates
Log-Likelihood.............      -1042.4
Restricted (Slopes=0) Log-L.      -1445.5
Chi-Squared (13)............       806.14
Significance Level.........     0.32173E-13
N(0,1) used for significance levels.
Cases=12750
```

Variable	Coefficient	Std. Error	t-ratio	Prob
TOTCST	-0.15405E-02	0.2600E-03	-5.926	0.0000
TRAVTIME	-0.50439	0.3351E-01	-15.053	0.0000
KING	0.65216E-04	0.6035E-05	10.806	0.0000
KINGDF	1.6768	0.3693	4.540	0.0000
SILVERDF	2.1234	0.3576	5.937	0.0000
REDDF	1.7725	0.1764	10.049	0.0000
PPKCHM	0.99084	0.2774	3.572	0.0004
TROUTDF	0.53781	0.1321	4.071	0.0000
HALIBRPT	0.51745	0.4959E-01	10.434	0.0000
HALDF	1.5854	0.1685	9.407	0.0000
PGROUND	0.88044	0.2246	3.920	0.0001
WHITE	0.29281E-03	0.7069E-04	4.142	0.0000
CROWD1	-1.0615	0.2979	-3.563	0.0004

Descriptive Statistics

Variable	Mean	Std. Dev.	Skew.	Kurt.	Minimum	Maximum
ACTUAL	0.3333E-01	0.1795	5.2	28.0	0.0000E+00	1.000
TOTCST	2088.	1667.	2.0	8.6	180.6	0.1467E+05
TRAVTIME	6.136	3.256	0.4	2.5	0.4000	18.80
KING	0.1208E+05	0.1191E+05	1.2	4.3	0.0000E+00	0.4994E+05
KINGDF	0.1360	0.1648	1.6	5.7	0.0000E+00	0.8129
SILVERDF	0.1735	0.1558	1.5	9.0	0.0000E+00	1.187
REDDF	0.1438	0.2798	2.7	9.7	0.0000E+00	1.259
PPKCHM	0.3373	0.3578	0.5	1.8	0.0000E+00	1.000
TROUTDF	0.2574	0.4304	2.2	8.0	0.0000E+00	1.916
HALIBRPT	0.5700	1.515	2.4	7.4	0.0000E+00	6.000
HALDF	0.2763	0.4578	2.3	8.9	0.0000E+00	2.094
PGROUND	0.2716	0.4185	1.1	2.2	0.0000E+00	1.000
WHITE	529.0	1156.	2.7	9.5	0.0000E+00	4727.
CROWD1	0.3814E-01	0.1606	4.6	24.7	0.0000E+00	1.000

Table 3b: Site Choice Equation for Southeast Incidental Anglers

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Discrete Choice Model
Maximum Likelihood Estimates
Log-Likelihood.............      -497.86
Restricted (Slopes=0) Log-L.     -934.67
Chi-Squared (12)...........       873.61
Significance Level.........     0.32173E-13
N(0,1) used for significance levels.
Cases=6240
```

Variable	Coefficient	Std. Error	t-ratio	Prob
TOTCST	-0.66890E-02	0.6253E-03	-10.697	0.0000
TRAVTIME	-0.43200	0.5710E-01	-7.565	0.0000
KINGDF	13.520	0.9806	13.788	0.0000
SILVERDF	2.3261	0.4867	4.780	0.0000
PRED	2.1939	0.4575	4.795	0.0000
PKCHMDF	1.7652	0.4871	3.624	0.0003
BDOLLY	0.17054	0.3029E-01	5.630	0.0000
TROUT	0.73632E-05	0.9288E-06	7.928	0.0000
HALIBRPT	0.32218	0.4537E-01	7.101	0.0000
BGROUND	0.67215	0.1050	6.404	0.0000
ASTEEL	1.9241	0.4780	4.026	0.0001
MONEY1	-0.96276E-02	0.2448E-02	-3.933	0.0001

Descriptive Statistics

Variable	Mean	Std. Dev.	Skew.	Kurt.	Minimum	Maximum
ACTUAL	0.5000E-01	0.2180	4.1	18.0	0.0000E+00	1.000
TOTCST	724.6	634.2	4.6	35.3	0.4000	7440.
TRAVTIME	4.714	2.929	0.2	1.7	0.0000E+00	11.50
KINGDF	0.1581	0.1461	0.5	2.3	0.0000E+00	0.5359
SILVERDF	0.1555	0.1585	2.4	15.3	0.0000E+00	1.187
PRED	0.1914	0.3201	1.4	3.5	0.0000E+00	1.000
PKCHMDF	0.2912	0.2375	1.2	4.0	0.0000E+00	0.9477
BDOLLY	8.480	3.172	-2.0	5.4	0.0000E+00	10.00
TROUT	0.4014E+05	0.1607E+06	4.1	18.0	0.0000E+00	0.7403E+06
HALIBRPT	0.2189	0.9315	4.6	23.1	0.0000E+00	5.500
BGROUND	2.330	2.282	0.1	1.2	0.0000E+00	5.000
ASTEEL	0.2611	0.3613	1.1	2.8	0.0000E+00	1.000
MONEY1	58.08	139.7	3.5	20.5	0.0000E+00	1612.

Table 3c: Site Choice Equation for Southcentral and Other Incidental Anglers

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 Discrete Choice Model
 Maximum Likelihood Estimates
 Log-Likelihood.............      -2358.0
 Restricted (Slopes=0) Log-L.     -3231.4
 Chi-Squared (10)............      1746.7
 Significance Level.........     0.32173E-13
 N(0,1) used for significance levels.
Cases=29171
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Variable	Coefficient	Std. Error	t-ratio	Prob.
TOTCST	-0.12672E-02	0.2403E-03	-5.273	0.0000
TRAVTIME	-0.44802	0.1948E-01	-22.993	0.0000
KING	0.18847E-04	0.2255E-05	8.356	0.0000
SILVERDF	3.4529	0.3538	9.759	0.0000
REDDF	1.2397	0.1108	11.185	0.0000
PKCHMRPT	0.12832	0.2801E-01	4.581	0.0000
HALDF	1.0499	0.9522E-01	11.026	0.0000
HALIBRPT	0.76470	0.3479E-01	21.980	0.0000
RBWRPT	0.56994	0.4841E-01	11.772	0.0000
DOLLYRPT	0.33457	0.2292E-01	14.598	0.0000

Descriptive Statistics

Variable	Mean	Std. Dev.	Skew.	Kurt.	Minimum	Maximum
TOTCST	635.4	620.6	5.7	68.9	0.4000	0.1328E+05
TRAVTIME	5.328	3.441	0.7	3.1	0.0000E+00	18.80
KING	0.1169E+05	0.2243E+05	3.9	19.0	0.0000E+00	0.1218E+06
SILVERDF	0.1200	0.1328	0.9	2.7	0.0000E+00	0.4524
REDDF	0.1567	0.3003	2.5	8.0	0.0000E+00	1.259
PKCHMRPT	0.5946	1.288	2.1	6.4	0.0000E+00	5.800
HALDF	0.1958	0.4482	2.8	11.0	0.0000E+00	2.094
HALIBRPT	0.4253	1.274	3.0	11.0	0.0000E+00	6.000
RBWRPT	0.1389	0.6889	5.4	31.1	0.0000E+00	4.500
DOLLYRPT	0.4187	1.128	2.8	10.2	0.0000E+00	6.000

Variable Definitions for Table 3

Variable	Definition
ACTUAL	Site actually chosen: coded 1 if this was the chosen site, 0 otherwise.
ASTEEL	Steelhead availability: coded 1 if available, 0 otherwise.
BDOLLY	Bag limit for dolly varden or arctic char.
BGROUND	Bag limit for ground fish
CROWD1	Crowding: coded 1 for combat fishing, 0 otherwise.
HALDF	Total 1992 halibut catch for the site divided by total angler days, set to 0 for weeks that halibut are not available or the fishery is closed.
HALIBRPT	Halibut fishing report, coded from 0 for closed or no information to 6 for really hot!
KING	Total 1992 king salmon catch for the site
KINGDF	Total 1992 king salmon catch for the site divided by total angler days, set to 0 for weeks that kings are not available or the fishery is closed.
KINGRPT	King salmon fishing report, coded from 0 for closed or no information to 6 for really hot!
MONEY1	Total cost for those who said not having to spend a lot of money to get to the site was an important factor in deciding where to fish.
PKCHMDF	Total 1992 catch for pink and chum salmon combined, divided by total angler days, set to for 0 weeks that pinks and chums are not available or the fishery is closed.
PKCHMRPT	Pink or chum salmon fishing report, coded from 0 for closed or no information to 6 for really hot!
PPKCHM	Peak season for pink or chum salmon, coded 1 for peak weeks and 0 otherwise.
PRED	Peak season for sockeye salmon, coded 1 for peak weeks and 0 otherwise.
PGROUND	Peak season for ground fish, coded 1 for peak weeks and 0 otherwise.
RBWRPT	Peak season for rainbow trout, coded 1 for peak weeks and 0 otherwise.
REDDF	Total 1992 catch for sockeye salmon, divided by total angler days, set to for 0 weeks that sockeye are not available or the fishery is closed.
SILVERDF	Total 1992 catch for silver salmon, divided by total angler days, set to for 0 weeks that silvers are not available or the fishery is closed.
TOTCST	Total cost: estimated costs of charter, guide, bait and tackle, fish processing, and food and lodging reported as fishing expenses, plus estimated travel costs from the reported origin to the site.
TRAVTIM	Estimated travel time from the reported origin to the site.
TROUT	Total 1992 trout catch, all species combined, for the site.
TROUTDF	Total 1992 catch for trout, all species combined, divided by total angler days, set to for 0 weeks that silvers are not available or the fishery is closed.
WHITE	Total 1992 white fish catch, all species combined, for the site.

Table 4. Comparison of Nonresident with Resident Results

	Non-residents	Residents
Trips to Kenai River	29,091	37,616
Trips to other Southcentral sites	69,554	61,029
Change in trips to Kenai River	927	4,045
Change in trips to other Southcentral sites	(852)	(3,399)
Change in expenditures, all Southcentral sites	126,562	108,669
Change in total WTP	35,288,865	1,345,291
Change per household (Southcentral origins)	$ 606.88	$ 22.17
Change per trip (base, all Southcentral sites)	$ 345.78	$ 13.64

Source for resident data: Institute of Social and Economic Research, *Economic Effects of Management Changes for Kenai River Late Run Sockeye*, prepared for Alaska Department of Fish and Game, January 1996; Appendix C, Table C-1 and Table VI-5, p. VI-13.