

# Comparison of Recent Sport and Commercial Fisheries Economic Studies

Presented to the  
Cook Inlet Salmon Task Force  
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Incorporates revisions to slides 9, 17, 21, 24 & 25  
made on February 3, 2009

## Who I Am

- Professor of Economics at the UAA Institute of Social and Economic Research (ISER).
- Studied economic issues related to Alaska fisheries for many years.
- Teach courses at UAA on the Alaska Economy and on Fisheries Economics.
- Currently preparing a report on what kinds of economic information exists and does not exist for Alaska's fisheries.

## Purpose of Presentation

- Two recent reports have examined economic impacts and contributions of sport fishing and commercial fishing in Alaska.
- I was invited to compare the results of these two reports.

## Outline of presentation

1. Comparison of report methodologies
2. Comparison of reports' estimates of economic importance
3. How accurate and reliable are the estimates?
4. What policy conclusions can we draw?

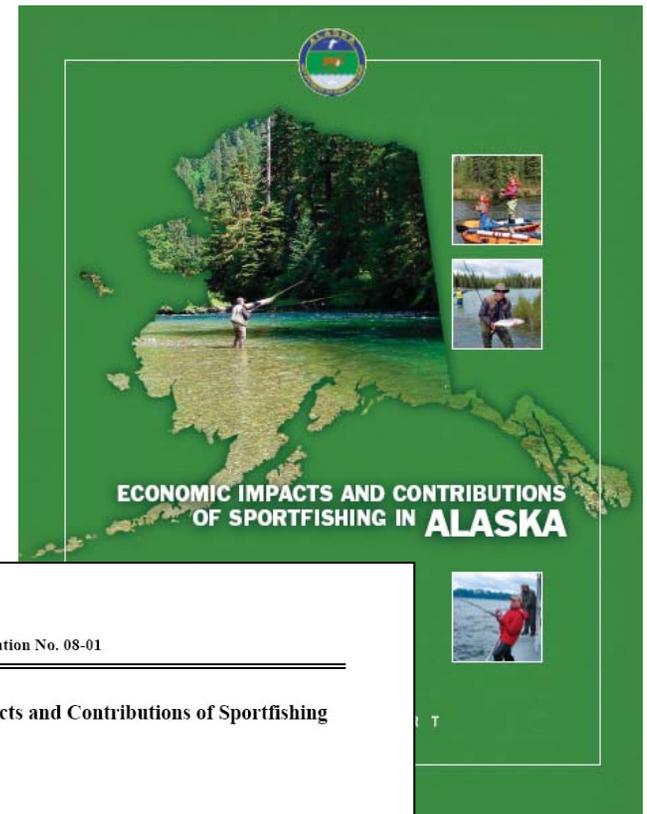
## “Sport Fishing Report”:

### *Economic Impacts and Contributions of Sportfishing in Alaska, 2007*

available at:

<http://www.sf.adfg.state.ak.us/statewide/economics/>

- Sponsored by: Alaska Department of Fish and Game, Division of Sport Fish
- Prepared by: Southwick Associates, Inc. in cooperation with ADFG staff
- Released: December 2008
- Pages: 289; 12-page summary



Professional Publication No. 08-01

#### Economic Impacts and Contributions of Sportfishing in Alaska, 2007

by  
Southwick Associates, Inc.  
and  
William J. Romberg  
Allen E. Bingham  
Gretchen B. Jennings  
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December 2008

Alaska Department of Fish and Game

Division of Sport Fish



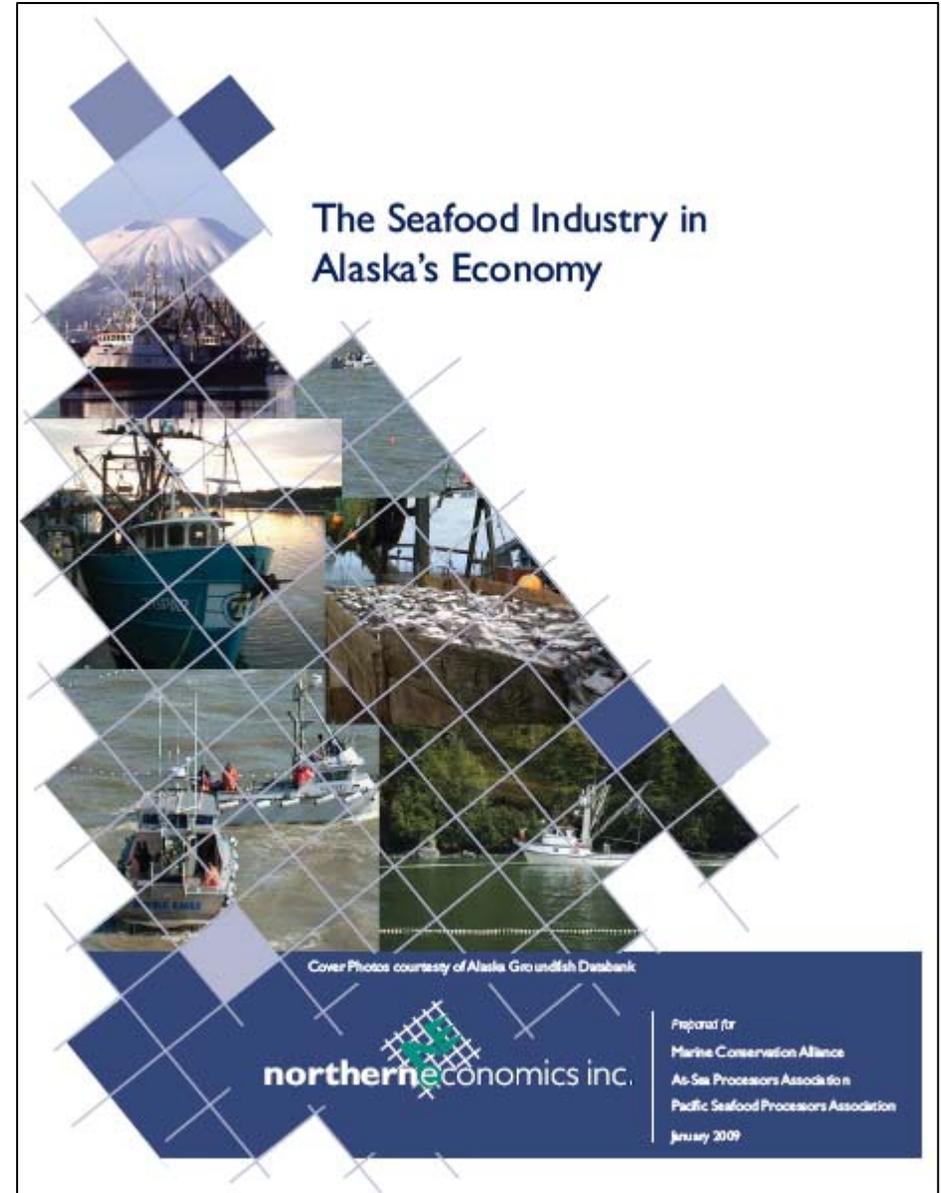
# Commercial Fishing Report

## *The Seafood Industry in Alaska's Economy*

*available at:*

[www.marineconservationalliance.org](http://www.marineconservationalliance.org)

- Sponsored by: Marine Conservation Alliance; At-Sea Processors Association; Pacific Seafood Processors Association
- Prepared by: Northern Economics, Inc.
- Released January 2009
- Pages: 77



## The Sport Fishing and Commercial Fishing Industries

	Commercial fisheries	Sport fisheries
What do they produce?	Fish products	Fish Angling experience Aesthetics Fishing Catching fish
Who are the consumers?	Fish consumers	Sport fishermen
Who is part of the industry?	Commercial fishermen Processors Fish transportation industries Distributors Retailers Restaurants	Charter operators Lodges Transportation industries Any other businesses supplying products or services used in sport-fishing

## Purpose of the Reports

### SPORT FISHING REPORT

- “to obtain current estimates of the economic contribution of sportfishing activities to the Alaska economy and to develop a consistent method for producing such estimates on a regular basis.”

(Executive summary, page 4)

Major goals were to collect new data and develop a method for estimating economic importance

### COMMERCIAL FISHING REPORT

- “to describe the economic importance of Alaska’s seafood industry, focusing primarily on the industry’s significance to the state economy. The report draws on data from a wide range of sources . . . .”

(Page 1)

Based on data regularly collected by the state

## A starting economic principle:

Sales of an industry to non-residents have a different effect on the Alaska economy than sales to residents.

- Sales of an industry to non-residents bring new money into the economy and increase the size of the economy
- Sales of an industry to residents don't necessarily bring new money into the economy and don't necessarily increase the size of the economy
  - Residents have only a limited amount of money to spend
  - If they spend more on Alaska fish or Alaska sport-fishing, they may buy less from other Alaska industries
  - If they spend less on Alaska fish or Alaska sport-fishing, they may buy more from other Alaska industries
  - Sales to residents probably have less effect on the Alaska economy (per dollars of sales) than sales to non-residents
- Economic terminology:
  - Economic contributions: Economic effects of all sales
  - Economic impacts: Economic effects of money brought in from outside the state or outside a region

Alaska's sport fishing and commercial fishing industries differ in the relative mix of sales to non-residents and residents

### SPORT FISHING INDUSTRY

- Sales are to both residents and non-residents

### SPORT FISHING REPORT

- Distinguishes between effects of sales to residents and non-residents
- Estimates both
  - Economic contributions
  - Economic impacts

### COMMERCIAL FISHING INDUSTRY

- Almost all sales are to non-residents

### COMMERCIAL FISHING REPORT

- Does not distinguish between effects of sales to residents and non-residents
- Estimates are mainly economic impacts

How economists define economic impacts of an industry . . .

<b>“Direct impacts” of the industry</b>	<b>“Indirect &amp; induced impacts” in other industries created as businesses and workers in the industry spend money within Alaska</b>	<b>Total impacts</b>
Sales or “output” of the industry	Sales or “output” in other industries	Total sales
Income earned in the industry	Income earned in other industries	Total income
Jobs or employment in the industry	Jobs or employment in other industries	Total jobs
Taxes paid by the industry	Taxes paid in other industries	Total taxes

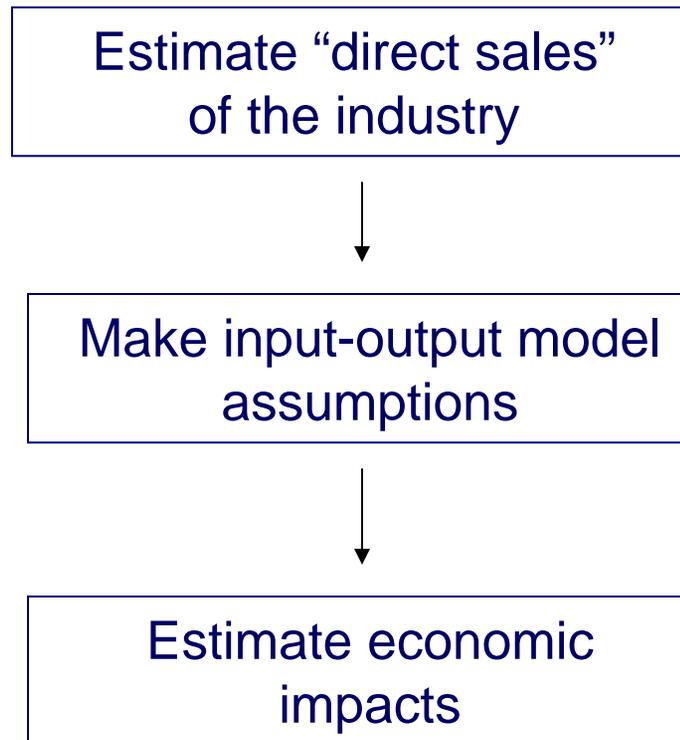
*Note: Economic contributions are defined in the same way.*

How economists estimate economic impacts of an industry:

1. Estimate “direct sales” of the industry  
(= total payments to the industry)
2. Use an “input-output model” to estimate how payments to the industry translate into sales of other industries as money circulates through the economy.
3. Use the “input-output model” to estimate how sales translate into income, jobs and taxes

<b>Direct impacts of the industry</b>	<b>Indirect and induced impacts in other industries</b>	<b>Total impacts</b>
Direct sales	Indirect & induced sales	Total sales
Direct income	Indirect & induced income	Total income
Direct jobs	Indirect & induced jobs	Total jobs
Direct taxes	Indirect & induced taxes	Total taxes

How economists estimate economic impacts of an industry:  
(simplified)



## Input-output models require lots of assumptions!

- Divide Alaska economy into industry sectors
- Divide Alaska economy into geographic regions
- Make assumptions, for each industry sector and each region, about how \$1 of sales translates into:
  - Purchases from other Alaska industry sectors, by region
  - Payments to workers in Alaska, by region
  - Tax payments in Alaska, by region

Making all these assumptions about payments between industry sectors requires a lot of data and a lot of work!

So Alaska economic impact studies usually use assumptions based on national studies—which may not be very realistic for Alaska.

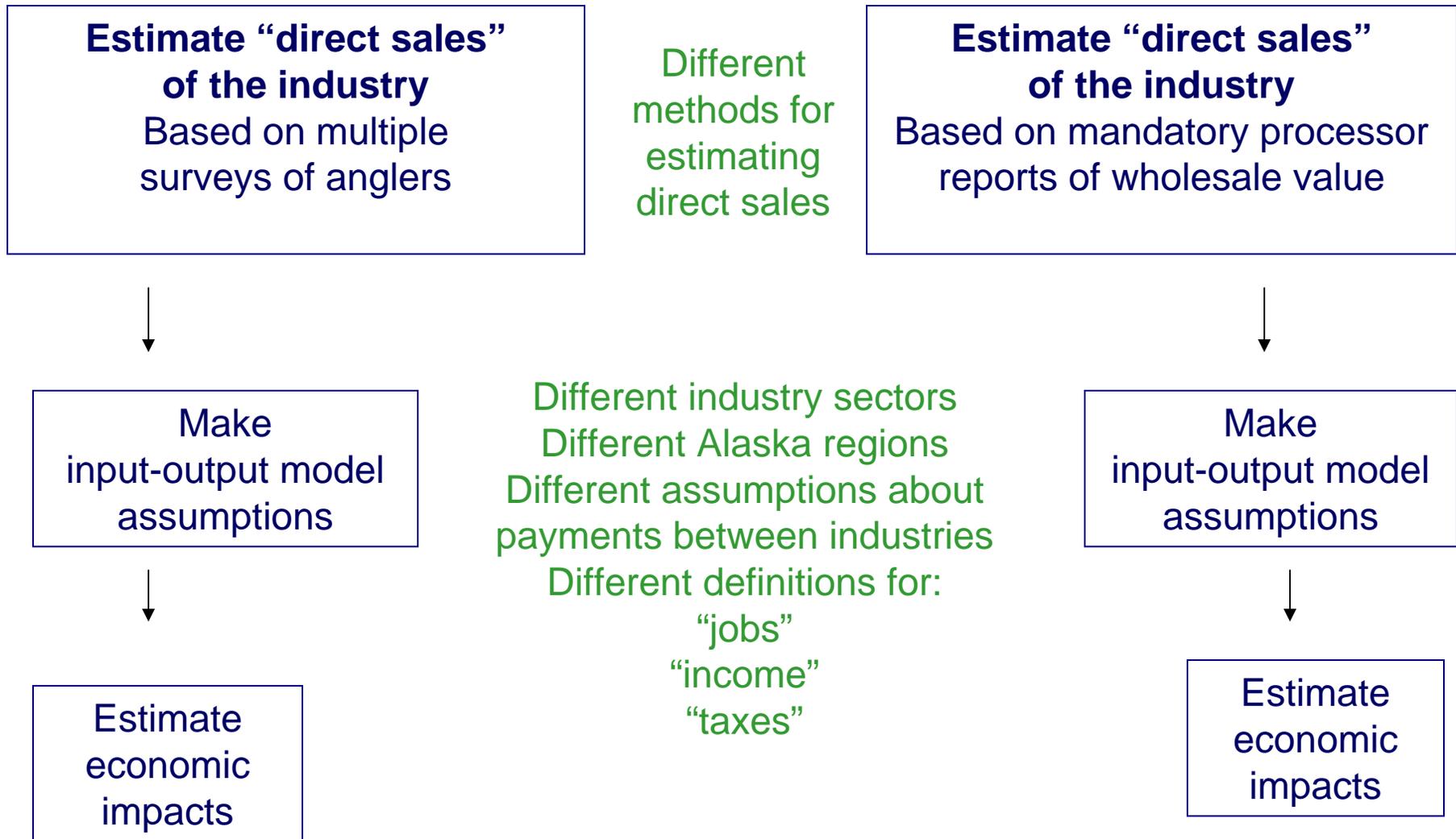
## Typical problems with comparing economic impact studies for different Alaska industries

- They divide the Alaska economy into different industry sectors
- They use different geographic regions
- They make different assumptions about sales between industry sectors

# Important differences in how the reports estimated economic impacts

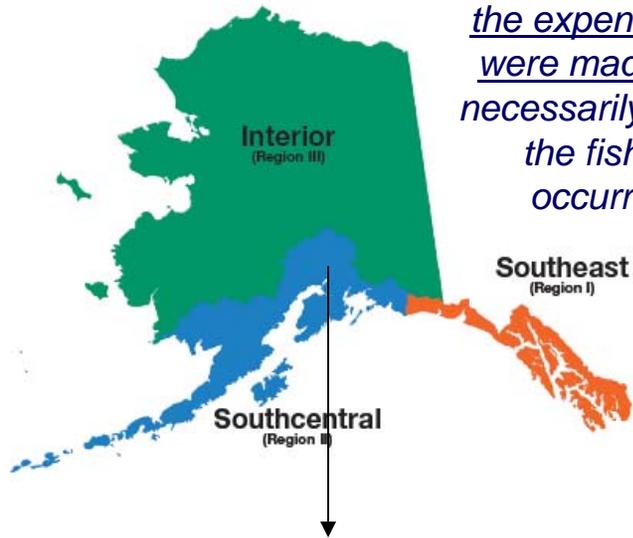
## SPORT FISHING REPORT

## COMMERCIAL FISHING REPORT



# SPORT FISHING REPORT

The sport fishing report regions are the regions where the expenditures were made--not necessarily where the fishing occurred.



“Cook Inlet Subregion”



The reports divided Alaska into different “economic regions” which are not directly comparable. Only the statewide economic impacts are directly comparable.

The commercial fishing report regions are the regions where the fish were harvested and processed.

# COMMERCIAL FISHING REPORT



The reports differed in how they treated fishing for different species

## SPORT FISHING REPORT

- Estimated combined economic impacts of sport fishing for all species
- Does not separate economic impacts of salmon sport fishing from economic impacts of sport fishing for other species such as trout and halibut

## COMMERCIAL FISHING REPORT

- Estimated statewide economic impacts separately for five broad species groups:
  - Salmon
  - Shellfish
  - Groundfish
  - Halibut
  - Herring

## Outline of presentation

1. Comparison of report methodologies
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## Comparison of Estimated Statewide Economic Importance in 2007

	SPORT FISHING REPORT		COMMERCIAL FISHING REPORT
	Estimated contribution (from all sales)	Estimated impact (from sales to non-residents)	Estimated contribution (= impact) (from all sales, almost all of which are to non-residents)
Direct sales	\$1.4 billion	\$0.7 billion	\$3.6 billion
Total sales	\$1.6 billion	\$0.9 billion	\$5.8 billion
Total income	\$.54 billion	\$.32 billion	\$1.75 billion
Total jobs	15,879	9,437	78,519

Note: There are important differences between studies in the methodologies and definitions. Note in particular that sport direct sales are based on estimates of total angler expenditures; commercial direct sales are based on wholesale value of seafood processed in Alaska. Note also that sport income includes payment to both labor and company owners; Commercial income includes only payments to labor.

Sources: Sport fishing report: Executive Summary, page 10; Commercial fishing report: Figures 36, 37, 38, 39

## Conclusions: Statewide Economic Importance

- Both the sport fishing and commercial fishing industries are large and important industries to Alaska
- If we assume that both studies estimates are correct, and that expenditures by residents don't bring new money into Alaska, then for all fisheries statewide:
  - Commercial fishing has about three times the economic contribution of sport fishing
  - Commercial fishing has about six times the economic impact of sport fishing
  - These conclusions are highly approximate and depend on numerous assumptions!!!!

## An important caveat!!!

The studies do not tell us what share of the income and jobs created by sport fishing and commercial fishing go to Alaska residents!

- Many of the jobs in commercial fish harvesting and processing are held by non-residents
- Many of the jobs in sport fish guiding and tourism services (seasonal hotels, restaurants, etc.) are held by non-residents
- But doesn't the Sport Fishing study distinguish between residents and non-residents?
  - In who spends the money: YES
  - In who gets the money: NO

What about the economic importance of Cook Inlet fisheries?

- We can't compare the reports
- The commercial report didn't estimate the economic importance of Cook Inlet fisheries

Something we can compare:  
 Estimated Direct Sales in the Cook Inlet Region\* in 2007

	SPORT FISHING REPORT		(ADFG data)
	Sales driving economic contribution (all sales)	Sales driving economic impact (sales to non- residents)	Sales driving economic contribution & impact (all sales, most of which are to non-residents)
Direct sales	\$732 million	\$275 million	\$163 million in first wholesale value**

\*Note: The geographic definitions differ between the sport fishing and commercial fishing reports, as noted in Slide 17. For the sport fishing report, the direct sales are all sales which occurred in the Cook Inlet region (which includes Anchorage)—not just those attributable to fishing which occurs in the Cook Inlet region. Thus the figures shown may overstate sales attributable to Cook Inlet sport fisheries. For the commercial fishing report, the figure shown is the first wholesale value of production which occurred in the Cook Inlet region (defined as Upper and Lower Cook Inlet).

\*\*Source is annual Commercial Operator Annual Reports to ADFG. Wholesale value by species group: Salmon \$77 million; Halibut \$51 million; Groundfish \$33 million; Shellfish & Herring \$1 million.

## Conclusions: Economic Importance of Cook Inlet Fisheries

- Both the sport fishing and commercial fishing industries are large and important industries in the Cook Inlet Region
- If we assume that the Sport Fishing Report's estimates of angler expenditures for Cook Inlet fisheries are correct, then:
  - The economic contribution of sport fishing may have been as much as 4½ times that of commercial fishing
  - The economic impact of sport fishing may have been as much as about 50% greater than that for commercial fishing.
    - Both of these ratios may be overstated to the extent that economic impacts of sport fishing from other regions occur in the Cook Inlet region.
  - The economic impact of Cook Inlet sport fisheries is probably significantly less than their economic contribution, because about 2/3 of sales for Cook Inlet sport fisheries are to residents—which bring less new money into the economy than sales to residents.
    - If all Cook Inlet sport fisheries disappeared, those residents would still spend a lot of that money in Alaska, in other ways.
  - These conclusions are highly approximate and depend on numerous assumptions!!!!

## Outline of presentation

1. Comparison of report methodologies
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3. How accurate and reliable are the estimates?
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## How accurate and reliable are the estimates???

### SPORT FISHING REPORT

**Estimate “direct sales”  
of the industry**  
Based on multiple surveys  
of anglers  
**Potentially large margin of error**  
**Potential for biased estimates**



**Make  
input-output model  
assumptions**



**Estimate  
economic  
impacts**

### COMMERCIAL FISHING REPORT

**Estimate “direct sales”  
of the industry**  
Based on mandatory processor  
reports of wholesale value  
**Not perfect but probably  
reasonably reliable**



**Make  
input-output model  
assumptions**



**Estimate  
economic  
impacts**

Different  
methods for  
estimating  
direct sales

Different industry sectors  
Different Alaska regions  
Different assumptions about  
payments between industries  
Different definitions for:  
“jobs,” “income,” “taxes”

Numerous assumptions mean that  
estimates for both fisheries are  
approximate at best. No reason to  
assume that either study’s  
assumptions are more or less  
reliable.

In judging the reliability of the sport fishing report, it's important to be aware of potential sources of error or bias in the estimation of angler expenditures.

- My point is not to criticize the report or its methodology.
- The report was done carefully and attempted to minimize errors and bias
- The report followed standard procedures used by economists to collect data about and estimate expenditures of anglers, tourists, and other similar groups
- It is inherently difficult and expensive to estimate expenditures for sport fishing because:
  - There are many different kinds of fishermen
  - They do many kinds of fishing
  - A lot of their spending (travel, food, etc.) is only partly for sport-fishing but is also partly attributable to other activities
  - Not everyone answers surveys
  - People may not answer surveys accurately

## How the sport fishing report estimated angler expenditures

Step	Selected potential sources of error or bias
Sent surveys to samples of resident and non-resident anglers	Samples may not be representative Anglers who returned surveys may not be representative
Used survey results to estimate <u>average trip-related expenditures per angler day</u> , by residency, region, type of water fished, and use of guides  Used survey results to estimate <u>average annual expenditures for equipment and angling-related real estate</u> per licensed angler	Anglers may not have answered the questions accurately Only asked about one trip per angler Difficult to accurately attribute how much of certain kinds of expenditures (travel, cars, etc.) are for sport-fishing
Estimated annual angler days based on the annual Statewide Harvest Survey of anglers.	Samples may not be representative Anglers who returned surveys may not be representative
Estimated expenditures as (Angler days x Average trip expenditure per day) + (Licensed anglers x Average equipment & RE expenditure per year)	

Note: Details of methodology are very complex and can only be understood by reading the report carefully!

## Examples of survey questions (from resident survey) . . .

14. When was the last time you went sportfishing in Alaska between JULY 1<sup>st</sup> AND OCTOBER 31<sup>st</sup>, 2007?  
(Check one.)  
 July       August       September       October       I did not fish between July 1st and Oct 31st (Skip to section C, page 6)

15. Fishing trips often include time for fishing, travel and non-fishing activities. How long was this fishing trip including fishing days, travel days and non-fishing days? Note that single-day trips do not need to take a whole day. For example, if the last time you went fishing JULY thru OCTOBER you only fished for a few hours after work, this would be counted as "1" day.  
Total number of days involved in last fishing trip: \_\_\_\_\_

16. How many days did you actually fish during this last time that you went fishing in Alaska between JULY 1<sup>st</sup> AND OCTOBER 31<sup>st</sup>? (Count partial days of fishing as "1" day).  
Number of days actually fished: \_\_\_\_\_

17. Would you have taken this trip even if you were unable to go fishing? (check one)  
 Yes       No

18. Was this trip primarily... (check one)  
 rod & reel sportfishing       dipnetting (personal use)       shellfish fishing

19. Was this trip primarily... (check one)  
 in freshwater       in saltwater       in both freshwater & saltwater

## Examples of survey questions (from resident survey) . . .

23. As best as possible, please tell us how much you spent and where you bought the following **TRIP-RELATED** items ON THE TRIP DESCRIBED ABOVE. Please write in the amount you spent and, referring to the included map, please circle the letter of the region or regions where you made the purchase(s). We will ask about your equipment purchases in later questions.

Items purchased on last trip (between JULY 1 <sup>ST</sup> AND OCTOBER 31 <sup>ST</sup> , 2007).	Total Amount Spent	Region or regions where you bought the item(s)
<b>EXAMPLE:</b>	\$ 25	A (B) C D (E) F
Licenses and stamps.....	\$	A B C D E F
Fuel and oil for your car, RV, boat, airplane, etc.....	\$	A B C D E F
Guide and charter fees .....	\$	A B C D E F
Airline tickets.....	\$	A B C D E F
Commercial transportation (air taxi, ferry, shuttle, etc.) ....	\$	A B C D E F
Fish processing & shipping.....	\$	A B C D E F
Rentals (boats, equipment, autos, etc.).....	\$	A B C D E F
Derby tickets.....	\$	A B C D E F
Boat launch and dockage fees.....	\$	A B C D E F
Ice .....	\$	A B C D E F
Bait (natural bait only, do not include lures) .....	\$	A B C D E F
Groceries, food, liquor bought in stores .....	\$	A B C D E F
Restaurants, bars, and take-out food purchases .....	\$	A B C D E F
Overnight lodging (hotels, campgrounds, cabins).....	\$	A B C D E F
Souvenirs and gifts.....	\$	A B C D E F
Other entertainment expenses during fishing trip .....	\$	A B C D E F
Other (please specify):.....	\$	A B C D E F

## Examples of survey questions (from resident survey) . . .

24. As best as possible, please tell us how much YOU spent and where you bought the following fishing equipment and fishing related gear in the last 12 months. Only report purchases made in Alaska – exclude purchases from catalogs and web sites of out-of-state companies. Include purchases YOU made for yourself and for others. Write in the amount spent and, referring to the included map, circle the letter of the region or regions where you made the purchase(s). Since some items can be used for non-fishing activities, please estimate the percentage that the purchased fishing related gear is used for sportfishing.

	Total amount spent	Region or regions where you bought the item(s)	% Used for sport fishing:
<b>EXAMPLE:</b> Clothing .....	\$ 40	A (B) C (D) E F	65 %
<b>FISHING EQUIPMENT:</b>			
Licenses and stamps .....	\$	A B C D E F	100 %
Rods, reels, & components .....	\$	A B C D E F	100 %
Fishing tackle (lines, leaders, lures, creels, stringers etc) .....	\$	A B C D E F	100 %
Tackle boxes, cases to protect fishing equipment .....	\$	A B C D E F	100 %

etc.

<b>FISHING-RELATED GEAR OR OTHER NON-FISHING PURCHASES:</b>			
Items to store/preserve fish (smoker, vacuum sealer, etc.) .....	\$	A B C D E F	%
Coolers, fish boxes .....	\$	A B C D E F	%
Clothing (fishing vest, raingear, head net, etc.) .....	\$	A B C D E F	%
Boots, shoes, waders and other footwear .....	\$	A B C D E F	%
Life jackets, survival suits or other PFDs, .....	\$	A B C D E F	%
Boats, canoes, rafts, kayaks and other watercraft .....	\$	A B C D E F	%
Boat motors .....	\$	A B C D E F	%

etc.

Camping trailer (pop-up, self-contained, 5 <sup>th</sup> wheel) .....	\$	A B C D E F	%
Other camping equipment (stoves, grills, lanterns, etc.) .....	\$	A B C D E F	%
Vehicles (trucks, SUVs, motorhomes, etc.) .....	\$	A B C D E F	%
Airplanes and related equipment .....	\$	A B C D E F	%

## Example of expenditure estimates for the southcentral region

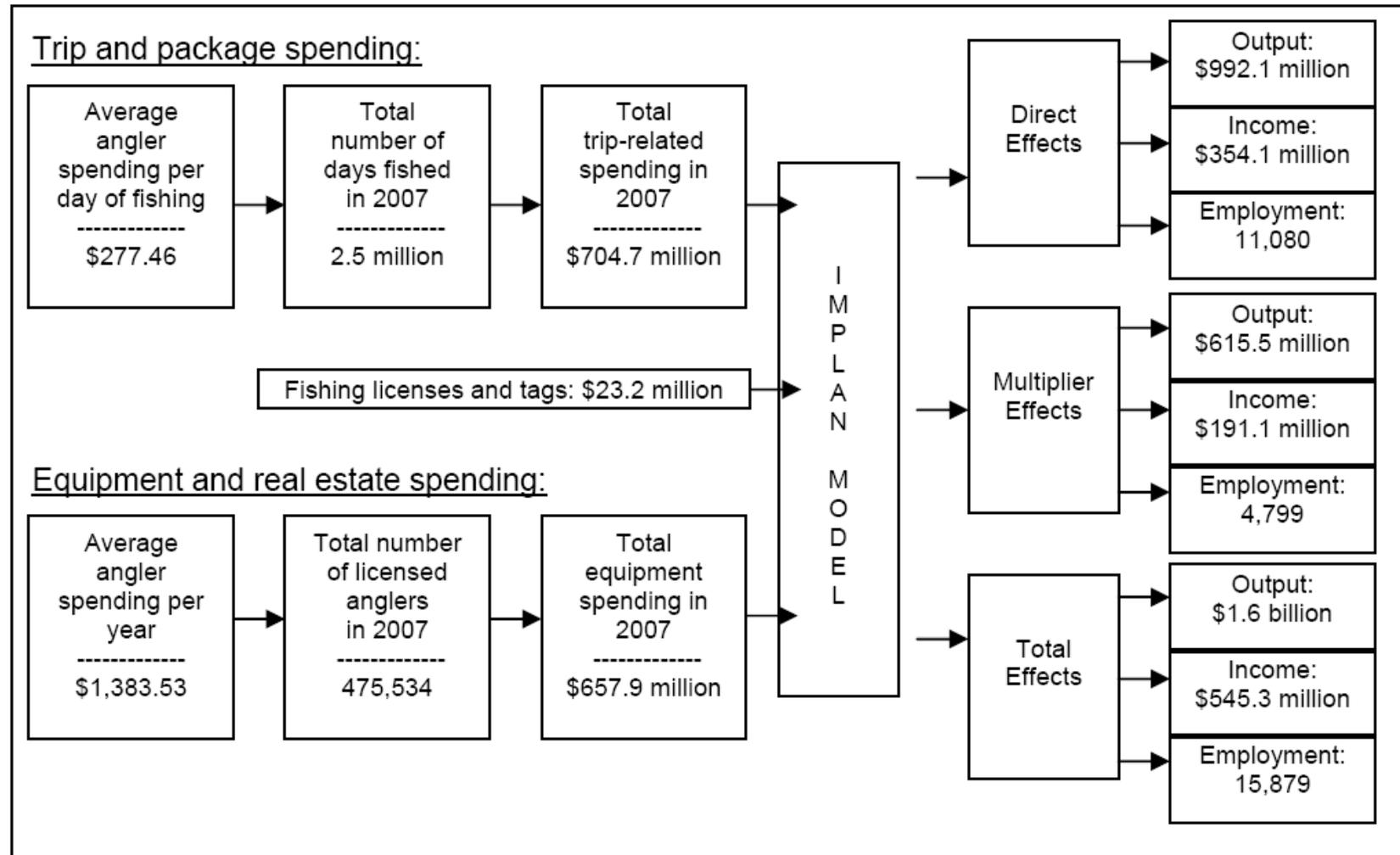
Table E10.—Expenditures in the southcentral region by resident and nonresident anglers, 2007.

	Resident Anglers		Nonresident Anglers		All Anglers	
	<i>Total</i>	<i>Per angler-day</i>	<i>Total</i>	<i>Per angler-day</i>	<i>Total</i>	<i>Per angler-day</i>
Trip Expenditures	\$181,889,019	\$167.49	\$236,024,061	\$332.03	\$417,913,080	\$232.59
Package Expenditures	NA*	NA*	\$90,130,556	\$126.79	\$90,130,556	\$50.16
Trips & Packages	\$181,889,019	<b>\$167.49</b>	\$326,154,617	<b>\$458.83</b>	\$508,043,635	\$282.75
	<i>Total</i>	<i>Per angler</i>	<i>Total</i>	<i>Per angler</i>	<i>Total</i>	<i>Per angler</i>
Equipment Expenditures	\$328,171,050	\$1,721.38	\$29,013,940	\$101.84	\$357,184,990	\$751.12
Real Estate Expenditures	\$50,895,003	\$266.96	\$72,434,491	\$254.25	\$123,329,493	\$259.35
Equipment & Real Estate	\$379,066,052	<b>\$1,988.35</b>	\$101,448,431	<b>\$356.10</b>	\$480,514,483	\$1,010.47
<b>Total Expenditures</b>	<b>\$560,955,071</b>		<b>\$427,603,048</b>		<b>\$988,558,119</b>	

\*Package expenditures refer specifically to travel packages purchased by nonresidents prior to departing on their trip to Alaska.

## Conceptual framework for how expenditure estimates were used to estimate economic contributions

Figure E2.—Conceptual framework for estimation of the economic contributions of angler spending in Alaska.



## How reliable are the sport-fishing expenditure estimates?

- We don't know
  - They are based on a very large number of assumptions
  - Clearly they are not precise estimates
  - The margin of error may be large
  - There is no obvious reason to conclude that they are too high or low
- They appear to be generally comparable with other studies
  - But other studies could have similar biases

The economic importance estimates for sport fishing are probably less reliable than for commercial fishing

- That doesn't mean they are too high or too low
- It only means they have a greater margin of error

## Outline of presentation

1. Comparison of report methodologies
2. Comparison of reports' estimates of economic importance
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Here are some important things to keep in mind when comparing economic impacts of commercial and sport fisheries:  
*(from my testimony to the Committee on May 22 2008 in Soldotna)*

- How fisheries are managed affects their economic impacts
- Public investments affect fisheries' economic impacts
- Even if catches and allocations stay the same, economic impacts can change significantly from year to year
- Economic impacts aren't necessarily proportional to fish catches

## Comparing Commercial and Sport Fishing Economic Impacts and Values How to Misuse Economics

*(from my testimony to the Committee on May 22 2008 in Soldotna)*

- Present economic information that isn't relevant to the policy issue under consideration
- Assume that economic impacts are proportional to fish catches
- Present irrelevant information about economic impacts in other areas
- Overstate the accuracy of estimated impacts or values

What policy conclusions can we draw from the report about sport-commercial allocation issues for Cook Inlet salmon?

- Neither report specifically estimated the economic importance of Cook Inlet salmon
  - The sport fishing report estimated the economic importance of all Cook Inlet sport fisheries combined
- It seems reasonable to conclude that the average economic contribution and impact per harvested salmon is considerably higher for Cook Inlet sport fisheries than for Cook Inlet commercial fisheries.
- Nevertheless, I believe the studies provide relatively little if any useful policy guidance on sport-commercial allocation issues for Cook Inlet salmon.

If the average economic contribution and impact per harvested salmon is considerably higher for Cook Inlet sport fisheries than for Cook Inlet commercial fisheries, why *wouldn't* that necessarily imply that we should reallocate salmon to sport fisheries????

*Here are a few potential reasons:*

- There is not a one-to-one tradeoff between commercial harvests and sport harvests
- Allocating more salmon to Cook Inlet sport fisheries will not result in proportionally higher economic contributions
  - It won't give Alaska anglers more money to spend
- The potential increase in sport fishing income and jobs won't all go to Alaskans
- The commercial industry is not viable without a certain threshold level of fishing opportunities and regular openings
- Diversification of economic activities is generally a good idea
- Not everyone wants more fishermen in Cook Inlet salmon streams (and more traffic, more crowded parking, etc.)
- Other things matter besides economic impacts—for example, treating people fairly

Am I saying that there is no potential economic justification for reallocating Cook Inlet salmon from commercial to sport fisheries?

- No!
- I am saying that comparing these two studies does not provide that justification
- Economic arguments for changes in allocation should be based on analysis and clear thinking about:
  - the specific expected economic effects
  - of the specific proposed policy change
- Even if average economic effect per fish in a region is higher in the sport fishery than the commercial fishery, that does not mean that all reallocations are always economically justified!