

The Most Important Things for Alaska Board of Fisheries Members to Know About Economics

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General Economic Concepts

There are three broad ways to measure the economic importance of fisheries: economic impact, gross value and net value. These measures vary widely in what they mean, how hard they are to understand, how hard they are to measure, and how good the information we have about them is.

	Economic impact	Gross value	Net value
Definition	How the fishery affects the economy	What people pay or would be willing to pay for what the fishery produces	What people pay or would be willing to pay for what the fishery produces, minus the costs of production
Analogy	How many people a company employs	The company's total revenues	The company's profits
Examples of measures	Number of jobs \$ of income \$ of tax revenue	\$ of gross value created	\$ of net value created
How hard is it to understand the concept?	Relatively easy	More difficult	Most difficult
How hard is it to calculate the measures?	Relatively easy	More difficult	Most difficult

There isn't any "best" way to measure the economic importance of fisheries. They are calculated in different ways and mean different things. Which measure is "best" depends upon the question you are trying to answer.

A fishery's relative economic importance may vary depending upon the measure. A fishery that creates a lot of jobs doesn't necessarily create a lot of gross value, and a fishery that creates a lot of gross value doesn't necessarily create a lot of net value—just like a company that has a

lot of workers doesn't necessarily have high revenues, and a company that has high revenues doesn't necessarily have high profits.

There may be a direct tradeoff between economic impact and net value. Employing more people increases economic impacts. But unless there is a corresponding increase in gross value, employing more people adds costs and decreases net value.

Economists define value in terms of what people actually pay or would be willing to pay—regardless of whether they actually do pay. The value of a fish is the same regardless of whether I pay you \$20 for the fish or whether you give it to me for free. The recreational value of a day fishing is the same regardless of whether I pay you \$200 to take me fishing or whether you take me fishing for free.

Fisheries may produce both market and non-market values. Market value is what people actually pay. Non-market value is what they would be willing to pay. If I paid you \$200 to take me fishing, that generated \$200 in market value (which you got). If I would have been willing to pay \$200 for the chance to go fishing, but I got to go fishing for free, that generated \$200 in non-market value (which I got). Economists say both kinds of value matter—but non-market value is harder to measure. Commercial fisheries create mostly market value. Sport fisheries generate significant non-market value. So the value of sport fisheries is harder to measure.

The economic value and impacts of fisheries can change over time. For both commercial and sport fisheries, values and impacts go up or down when prices and costs go up or down. Prices and costs can and do go up and down a lot, and economic values and impacts of Alaska's fisheries can and do go up and down a lot.

The economic value and impacts of both commercial and sport fisheries depends on how they are managed. If we limited Kenai River sport fishing to a few exclusive guiding services catering to wealthy outside anglers, Kenai River sport fishing might create higher profits but far fewer jobs. If we allowed fish traps, our salmon fisheries would probably create higher profits but far fewer jobs. If we manage commercial fisheries in ways that make it difficult to be profitable, they won't generate high net value.

Economic value and impacts are not necessarily proportional to fish harvests. For both commercial and sport fishing, there are fixed economic impacts and costs that are the same regardless of how many fish you catch—like what it costs to get your boat in the water, the number of crew on a commercial fishing boat, or the number of people working at the restaurant where you eat after a day sport fishing on the Kenai. Costs and impacts per fish tend to go down as harvests go up because these fixed costs are spread over more fish. Gross value per fish tends to stay the same in the commercial fishing industry as harvests go up, but probably goes down for sport fishing (your tenth fish of the day isn't worth as much to you as your first fish).

Fisheries generate economic impacts in other industries besides those directly associated with fishing. Economists use the term *upstream industries* to refer to the industries which supply the fishing industry with goods and services. They use the term *downstream industries* to refer to other industries which use the fish, such as fish processing. Economists use the terms

direct impacts to refer to impacts of the industry itself; *indirect impacts* to refer to impacts generated by purchases of the industry from other industries; and *induced impacts* to refer to impacts generated as income created by direct and indirect impacts is respent throughout the economy. The use the term *multiplier* to refer to the extent to which impacts created by the industry itself are “multiplied” in the form of indirect and induced impacts. These “multiplier effects” may be spread out in other regions of Alaska as well as other states and countries.

Allocation matters! What matters for most fisheries issues is not just what the total economic impact or economic value is. It also matters who gets the jobs and who gets the value! It matters if they are local residents or not It matters if they are Alaskans or not. Economists sometimes forget how important allocation is.

Contrasting Economic Characteristics of Commercial and Sport Fisheries

Commercial and sport fisheries differ significantly in what they produce. Commercial fisheries mainly produce fish, which are used to produce a wide variety of fish products. Sport fisheries produce both fish and recreation.

Commercial and sport fisheries differ significantly in who participates in and benefits from them. They generate jobs, income and profits in different kinds of industries. They differ create different kinds of benefits for different kinds of people. The extent to which these different kinds of people are local residents and/or Alaska residents varies between and within commercial and sport fisheries.

Commercial and Sport Fisheries: Who Benefits Directly

		Commercial Fisheries	Sport Fisheries
People benefiting from jobs, income, and profits	Catching fish	Commercial fishermen	
	Providing services and supplies to people catching fish	Boat and gear supply & repair companies Fuel distributors	Charter Operators Lodges Transportation companies Boat and fishing gear manufacturers & retailers Hotels & restaurants
	Processing and distributing fish	Fish processors Fish transportation companies Wholesalers & Distributors Retailers Restaurants	Custom processors
People enjoying eating fish		Fish consumers	Sport fishermen and their families and friends
People enjoying recreation			Sport fishermen

There are significant differences among sport fisheries in the relative contribution of fish and recreation to economic value. In personal use fisheries, most of the value (willingness to pay) derives form the fish people bring home to put on their table or on their freezer. In catch

and release fishing, all of the value derives from the recreation in catching the fish. For most kinds of sport fishing, both kinds of benefits are significant.

Our economic objectives for sport fisheries probably vary depending upon the extent to which the benefits derive from fish or recreation. For sport fisheries where the main value is fish for Alaskans, the objective is usually to keep costs low—which reduces the economic impacts of these fisheries. For sport fisheries where the main value is recreation for tourists, we are less interested in keeping costs low and more interested in creating employment opportunities such as guiding—which tends to increase economic impacts.

Both commercial and sport fisheries are clearly of major economic significance to Alaska. It's silly to argue that either commercial or sport fisheries aren't important. They are both clearly very important. However, the relative economic importance varies widely between fisheries and regions.

The differences between and within commercial and sport fisheries create major challenges in comparing the economic importance of commercial and sport fisheries. It's hard to develop common yardstick measures when the activities, benefits, and who participates varies so dramatically. Not impossible, but hard.

The potential for anglers to change where they fish creates an extra challenge in measuring the economic importance of sport fisheries. If a particular sport fishery were to shut down entirely, that particular region would lose all of the economic impacts and value. But Alaska wouldn't lose all the economic impacts and value—because some of the sport fishermen would fish somewhere else—creating economic impacts and value in other regions. The economic impacts for Alaska could even increase if the sport fishermen spent more to fish in the other fisheries. This makes it much harder to tell how the Alaska economy would be affected by a change in a particular fishery. In contrast, if a commercial fishery is shut down, there isn't a way to substitute by catching more commercial fish in another region. We catch almost all the commercial fish which are potentially available for us—but we don't use all the recreation which is potentially available for us.

Collecting and Analyzing Economic Data

Collecting reliable economic data is difficult, expensive and intrusive. It's difficult to get people to provide accurate data, to enter the data into databases, and to analyze data in meaningful ways. It takes time and it costs money. And asking people to provide data is intrusive: it takes their time and asks them for information they may prefer not to provide (such as how much they earn). These are among the reasons for which we have much less data for our fisheries than we would need to fully measure their economic impacts and values.

Economic surveys are difficult and expensive to do well. Like political polls, surveys aren't reliable and may be very misleading unless the people you survey are representative of the population you are trying to generalize about. But it can be hard to find a representative sample of fishermen who are willing to answer questions which take time and may be intrusive. Any

time you are looking at information based on a survey, be sure to understand how representative the sample was or wasn't.

Regular, routine data collection is more reliable than occasional ad hoc surveys. If you collect data only occasionally, in different ways each time, then changes in the data over time is relatively more likely to reflect changes in how you collected the information than changes in what's actually going on.

It's a lot easier to collect data if people are required to give it to you. The most reliable data we have for our fisheries is based on information people are required to provide—like commercial fishermen's catches (on fish tickets), what products fish processors produce (on commercial operator's annual reports), and where sport fishermen live (when they buy licenses). If we want more data, the most effective way to get it (but probably not the most popular) would be to require people to provide it.

It is relatively easier to collect data for commercial fisheries than for sport fisheries. There tend to be fewer people involved, and it is easier to find them and to ask or require them to provide data, and enforce that they are providing it accurately.

Objective parallel economic studies of commercial and sport fisheries are more likely to be reliable than comparing results of studies done by different people for different reasons. If studies are done by different people for different reasons, difference in economic importance are relatively more likely to be due to differences in study methodology.

Some kinds of economic measures are harder to estimate than others. If you have data, it's generally easier to estimate economic impacts than economic value. It's generally much easier to estimate market values than non-market values.

Input-output modeling is a technique economists use to estimate direct, indirect and induced economic impacts of an industry. It requires a lot of assumptions about expenditure flows between industries. To save on the cost of collecting Alaska-specific information about these expenditure flows, Alaska economic studies often just use assumptions based on national patterns of expenditure flows. A problem is that these national data may not be representative of expenditure flows in Alaska.

Contingency valuation is a technique economists use to estimate non-market values. It is based on asking people what they would be willing to pay for things or experiences. Contingency valuation is a relatively cheap and simple methodology for estimating non-market values. But it is hard to tell how reliable the results are, because people may not tell the truth about what they would be willing to pay (they may not even *know* what they would be willing to pay), and how they answer may depend on how you ask the question.

Travel-cost analysis is a technique economists use to measure non-market values. It is based on inferring what people would be willing to pay for something from patterns in what they actually do pay—such as the cost of traveling to a fishing site. Travel cost analysis requires extensive data collection about where people travel and what they pay to get there. It is a

powerful analytical technique but also very complicated—so it’s hard for most people to understand exactly what it means or how reliable the analysis is.

What Kinds of Economic Information Exists for Alaska Commercial and Sport Fisheries?

In general, we have better economic data and analysis for Alaska commercial fisheries than for Alaska sport fisheries. We have economic data and analysis for both kinds of fisheries, but there are bigger gaps and more problems with the data and analysis for sport fisheries.

Data for Commercial and Sport Fisheries: What We Have and Don’t Have

	Commercial fisheries	Sport fisheries
What we have good data for	Harvest volume Wholesale product volume Ex-vessel & wholesale value Permits fished by residency	Number of licenses
What we have fairly good data for	Approximate number of people employed in commercial fishing Processing employment (but not by species)	Trips and days fished by area Catches by area
What we have limited data for	Expenditures and profitability of processors and fishermen	Expenditures by sport fishermen (but most data are out of date, and not reliable for specific fisheries)
What we have little or no data for	Volume of fish consumed in Alaska Economic impacts and value beyond processing (transportation, retail, restaurants)	Up-to-date indicators of non-market benefits
What it would take to get more data	More detailed mandatory reporting by processors and wholesale buyers More data processing and analysis by state government	

Given the kinds of data which exist, in general, I would rank the relative quality of the information we have about the economic importance of commercial and sport fisheries as follows:

	Economic impact	Gross value	Net value
How good is the information we have?	Commercial fisheries: B Sport fisheries: C+	Commercial fisheries: A- Sport fisheries: D	Commercial fisheries: C+ Sport fisheries: D-

My Advice on How the Board Should Use Economics

Don’t accept an economist’s recommendations unless you understand and agree with the objectives which the economist assumed. Any time an economist makes a recommendation, it has to be based on some kind of assumed objective—which may be explicit or implicit (not stated). The economist may be assuming that the objective is to maximize economic impacts, or

gross value, or net value, or something else. Find out what the economist assumed was the objective, and make sure you share that objective.

When you use economics, ask these questions in this order:

- **What is the policy issue?** What are choices you face? Make sure any economic analysis you use is relevant to the economic implications of these choices.
- **What are your economic objectives?** Are you concerned about economic impacts or values? Are you concerned about who shares in these economic impacts or values? Make sure that any economic analysis you use is relevant to these economic objectives.
- **What are the best available estimates of how the different choices affect the objectives?** For any issue, there is some best available estimate—which may range from a detailed economic study to a back-of-the-envelope calculation to simple best guess.
- **How reliable are the best available estimates?** Are they reliable enough to show which option best meets your objectives?
- **What conclusions, if any, can you draw based on the available information?** Note that it may often *not* be possible to draw reliable conclusions based on the available information.
- **Is it possible, and worth it, to collect more data and do more analysis, to develop better estimates?** Collecting more data and doing more analysis takes time and money, and may not be worth it.

How to Misuse Economics

There are many ways to misuse economics. They happen regularly. Learn to recognize them. Here are some of the most common.

- Use economic information that is not relevant to the policy issue.
- Use economic information that is not relevant to the objectives that matter.
- Use economic estimates based on unreliable data.
- Draw conclusions not supported by the margin of effort in the analysis.
- Start with your conclusions—and find a way to make the data show your conclusions.
- Use only economics—and ignore other relevant factors and objectives.

How Can You Tell What is Good Economics?

Economics can be done well or done badly. Because economics can be complicated, it can be hard to tell whether an economic analysis has been done well or not. But even if you don't understand the details, you can make a reasonable judgment about the quality of an economic study by keeping several basic principles in mind.

Garbage in, garbage out. Economics is based on assumptions—about what people do, why they do it, and how it affects fisheries and the economy. Try to understand what economists are assuming and whether the assumptions seem reasonable. If they don't, the conclusions may not be reasonable either.

Focus on the most important assumptions. In any analysis, some assumptions are more important than others. Focus on what your intuition tells you should be the most important assumptions driving an economist's analysis.

How reliable are the data? Most economic studies require data. Ask about where the data came from and how reliable they are. If the data are based on surveys, how representative was the survey sample?

Did the economist leave out any important factors? An elaborate economic analysis can still be misleading if it leaves out important factors.

Did the economist say how certain or uncertain the conclusions are? For any economic analysis, what matters is not just the conclusions, but how reliable they are. Be suspicious of economic analyses that don't say anything about the potential margin of error of the analysis. If they don't say anything about it, ask about it. Find out if the conclusions are sufficiently reliable for how you want to use them.

More complex is not necessarily better. Don't be impressed just because an economic analysis is complicated and you can't understand it! It doesn't necessarily mean that it's well done. An elaborate economic analysis isn't necessarily any better than a back-of-the-envelope calculation—or your intuition—unless it is based on reliable assumptions and considers the most important factors, and it's possible to tell how certain or uncertain the conclusions may be.

Do the conclusions make sense? If an economist's conclusions don't make sense to you, be suspicious and ask questions. Even if an economist uses a complex methodology to arrive at a conclusion, it should be possible for the economist to explain the conclusions in a way that make intuitive sense, even if you don't necessarily follow the details of the calculations.

Do you share the economist's assumed objectives? If an economist offers recommendations, make sure you understand and agree with the objectives that the recommendations are based on.

Conclusions: The Limits of Economics

Economics is clearly relevant and important to the issues the Board addresses. The Board of Fisheries allocation criteria (in Board of Fisheries Finding #91-3-FB) clearly include—but are not limited to—economic importance:

- the history of each personal use, sport, and commercial fishery;
- the characteristics and number of participants in the fisheries;
- the importance of each fishery for providing residents the opportunity to obtain fish for personal and family consumption;
- the availability of alternative fisheries resources;
- *the importance of each fishery to the economy of the state;*
- *the importance of each fishery to the economy of the region and local area in which the fishery is located;*
- the importance of each fishery in providing recreational opportunities for residents and nonresidents.

There are significant practical limits to how the extent to which the Board will be able to effectively use economics to help resolve some issues. These include.

- Fundamental difficulties and costs of collecting and analyzing data
- Complexity of the issues
- Fundamentally political nature of many issues faced by the Board

Given these limitations, it's always going to be difficult to use economics in making our fisheries policy—but we can and should do better. To the extent practical, we should:

- Ask more questions about the implications of fisheries policy choices.
- Collect more data more systematically.
- Do more economic analysis using the data we collect
- Make the data and analysis more conveniently available to the Board
- Get better at understanding and using economic analysis.