Five Principles for Economic Comparisons of Commercial and Sport Fisheries

by

Gunnar Knapp
Institute of Social and Economic Research
University of Alaska Anchorage
3211 Providence Drive
Anchorage, Alaska 99508
907-786-7717 (telephone)
907-786-7739 (fax)
Gunnar.Knapp@uaa.alaska.edu

April 2001

This paper is summarized from part of a longer paper entitled Basic Issues in Economic Comparisons of Commercial and Sport Fisheries: A Study of Allocation Alternatives for Alaska’s Kenai River Sockeye Salmon Fisheries, which I wrote together with Jeff Hartman and Mike Mills of the Alaska Department of Fish and Game, and which was published in the Proceedings of the First North American Fisheries Economics Forum, New Orleans, Louisiana, April 2001.
Introduction

Allocation between commercial and sport fisheries is a difficult and divisive issue in fisheries management. As conflicts over allocation have increased, so has the interest in the relative economic contributions of commercial and sport fisheries. Both sport and commercial fishing groups are interested in demonstrating the economic importance of their respective fisheries.

As an Alaska economist interested in fisheries, I have seen a number of different economic comparisons of commercial and sport fisheries. I have frequently found these comparisons misleading. Even when the economic analysis is technically correct, it is all-too-easy to draw misleading conclusions.

In this short paper, I suggest five principles for economic comparisons of commercial and sport fisheries. These principles do not relate to the technical issues in calculating economic impacts and value (although there are many complicated technical issues). Rather, they relate to how these measures of economic impacts and value should be interpreted and used. These principles are:

1. The measures of economic effects—economic impacts or economic value—should be the same for both fisheries and should be relevant to the purpose of the comparison.
2. Economic comparisons of commercial and sport fisheries should be relevant to the policy choices under consideration.
3. To be relevant to policy choices, economic comparisons of commercial and sport fisheries should address marginal economic effects of the policy choices under consideration, rather than total or average economic effects of commercial and sport fisheries.
4. The geographic area for which economic effects are measured and compared should be appropriate for the policy choices under consideration.
5. Economic comparisons of commercial and sport fisheries should consider indirect economic effects of policy choices if these indirect effects are relevant to the policy issues under consideration.

These principles are relevant for any economic comparison of commercial and sport fisheries, ranging from a formal economic study to back-of-the-envelope comparisons.

My purpose is not to suggest that economic comparisons of commercial and sport fisheries should not be done or should not be considered. On the contrary: I think they should be done, and they should be considered. But they should be done correctly.

1. The measures of economic effects—economic impacts or economic value—should be the same for both fisheries and should be relevant to the purpose of the comparison.

Some economic studies of commercial or sport fisheries measure economic impacts, some measure economic value, and some measure both. For any economic comparison of commercial
and sport fisheries, it is important that the same measures are being used and that they are relevant to the purpose of the comparison.

These difference between the concepts of economic impacts and economic value is poorly understood by non-economists, and the two concepts are often confused. Net economic value is a measure of benefits minus costs: we add up all the benefits of a change, and then subtract the costs. Economic impacts are changes in payroll, jobs, or sales. Impacts are aggregate rather than net measures of change.”

There is a big difference between these two measures. In some cases, higher economic impacts may be associated with lower economic value, or vice versa. For example, if anglers have to spend a large amount of money to fish a fishing stream, this increases the economic impact of the fishery, by increasing the incomes of gas station owners, fishing guides, tackle shop owners, and so forth. However, these costs to the angler reduce the net economic value of the sport fishery.

There are also big differences in methods and data requirements for measuring economic value and economic impacts. Measurement of economic impacts requires data on expenditures by sport and commercial fishermen, as well as data on expenditure flows between different sectors of the economy.

Conceptually at least, the comparison of economic impacts between commercial and sport fisheries is straightforward. In contrast, the comparison of economic values between commercial and sport fisheries is much more difficult, because economic values of commercial fisheries are primarily “market values” which can be measured based on market prices and costs, while economic values of sport fisheries are primarily “non-market values” which can not be directly observed.

Which measure should be used? The answer depends entirely upon the purpose of the study. What, in fact, do those who are funding the study or who hope to use the results wish to know? Economists, who are typically concerned with economic efficiency in the allocation of resources, will often argue that economic comparisons of commercial and sport fisheries should focus on economic value or net economic benefits of fisheries. However, policy makers and the general public may be far more interested in economic impacts, in particular jobs and income.

2. Economic comparisons of commercial and sport fisheries should be relevant to the policy choices under consideration.

Economic comparisons of commercial and sport fisheries are useful in making policy choices only if they are relevant to those policy choices.

A related point to be drawn is that economic studies of particular commercial and sport fisheries are not necessarily relevant to other fisheries or issues.

Another related point is that in designing economic studies of commercial and sport fisheries, there is a tradeoff between how specifically to focus on particular policy issues as opposed to developing more general economic information about the fisheries. The more specifically a
study focuses on a particular policy issue, the more relevant it is to that issue, but the less useful the results of the study may be for addressing other issues.

3. To be relevant to policy choices, economic comparisons of commercial and sport fishery should address marginal economic effects of the policy choices under consideration, rather than total or average economic effects of commercial and sport fisheries.

This issue directly affects the relevance of an economic comparison for a given policy choice.

Total economic effects are the total economic value or economic impacts associated with a commercial or sport fishery. Average economic effects are total economic effects divided by the number of fish harvested. Marginal economic effects are the economic changes resulting from a change in harvests, which may also be measured in terms of marginal economic effects per fish harvested. 

There is an important difference between average economic effects and marginal economic effects. To the non-economist it may appear that—and user groups may argue that—a commercially caught fish will have a certain economic value or economic impact per fish and sport caught fish have a different (higher or lower) value per fish. It may seem logical to argue, for example, that if sport fishermen catching 1000 fish derive a total economic value of $20,000—or $20 per fish—that allocating these sport fishermen another 1000 fish would result in a further increase in economic value of $20,000.

However, this is not necessarily the case at all. In both commercial and sport fisheries, both total economic value and total economic impacts are clearly not necessarily proportional to total catch. Both economic value per fish and economic impact per fish depends on how many fish are being caught. Put differently, average economic value or impact per fish may be very different from marginal economic value or impact per fish.

For a sport fisherman, economic value is a non-market value derived in part from the sport fishing experience which is clearly not necessarily directly proportional to the number of fish caught. Most anglers probably derive more enjoyment from catching their first fish of the day than from catching their sixth fish. Put differently, the difference between catching six fish and five fish is not the same as the difference between catching one fish and zero fish.

The economic impacts associated with sport fisheries—income and jobs—result from expenditures by anglers such as for travel, tackle, boats or guiding services. These expenditures may be relatively fixed, regardless of the number of fish caught. If the number of fish allocated to sport anglers doubles but the number of anglers stays the same, this may result in much better fishing but no increase in total expenditures by anglers—in effect cutting in half the “economic impact per fish.” Even if the number of anglers increases in response to better fishing, there is no reason to assume that the increase in expenditures would be directly proportional to the number of fish.

---

1 Average and marginal economic effects need not necessarily be measured per fish harvested. In some cases, it may be more appropriate to measure these effects per fish allocated, in particular when not all of the fish allocated to a fishery are necessarily harvested.
Similarly, many of the costs faced by commercial fishermen are fixed costs of boats and gear, or semi-fixed costs such as fuel expenditures per trip. If the total commercial harvest increases, profit per fish (a rough measure of economic value per fish) may go up, and the size and distribution of economic impacts per fish may change.

For all of these reasons, calculating total or average economic effects of commercial or sport fisheries and applying these average effects to specific marginal policy choices such as changing allocations between fisheries is of questionable validity. Estimates of marginal economic effects of policy decisions are of far greater relevance to policy decisions about marginal changes in fisheries than are estimates of total or average economic effects.

In fact, knowing the total economic effects of any sport or commercial fishery is of questionable relevance to any policy decision unless the decision involves whether to eliminate the entire fishery. In the hypothetical example above, knowing that a sport fishery which harvests 1000 fish has a total value of $20,000 says nothing about the value that would be generated by increasing the allocation to the fishery (except that it would probably be less than $20 per fish).

However, there are problems associated with measuring marginal economic effects rather than total economic effects. First, it is usually more difficult to measure marginal economic impacts than it is to measure total economic impacts. It is much easier to learn how much anglers spend in total on fishing gear and fishing trips than it is to learn how their expenditures would change in response to a specific policy change.

Second, many members of the public and policy makers are confused by the difference between marginal and average impacts. They want to know the answer to an apparently simple question—“what is the value per fish?”—and may not want to hear that the answer depends upon whether we are talking about the first fish harvested, the last fish harvested, or the “average” fish harvested.

4. The geographic area for which economic effects are measured and compared should be appropriate for the policy choices under consideration.

Economic effects of both commercial and sport fisheries depend critically on how the geographical area is defined for which economic effects are measured. There may be significant differences between commercial and sport fisheries in the geographic distribution of economic impacts as well as the geographic distribution of costs and benefits.

For example, in considering economic effects of Cook Inlet commercial and sport fisheries, there are at least four possible ways of defining the geographic area of interest: the local area (the Kenai Peninsula), the State (Alaska), the country (the United States), and the world. The economic benefits estimated for both fisheries are larger, the larger the area for which benefits are included.

Many of the economic impacts of both the sport and commercial fisheries occur outside the State of Alaska, such as expenditures of non-resident sport fishermen for travel or expenditures of commercial fishermen for gear. Commercial fisheries also generate a wide variety of “downstream” economic impacts and benefits outside of Alaska, associated with processing, distribution and consumption of fish.
5. Economic comparisons of commercial and sport fisheries should consider indirect economic effects of policy choices if these indirect effects are relevant to the policy issues under consideration.

For sport fishing in particular, if fishing is not available in one area, that doesn’t necessarily mean that the people who would have fished stay home. They may, instead, “substitute” another area—they may go fishing in a different place or for a different species. Thus an indirect effect of less fishing in one place might be more fishing in another place—and vice versa.

Unless we consider these indirect effects, we may exaggerate how much economic benefit results from any particular sport fishing opportunity, or how much economic loss results from taking away that sport fishing opportunity.