

Research in fisheries management: who decides, who pays, and how much is enough?

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The Problem

Research in US fisheries management is dominantly an applied problem directed to producing better outcomes from our fisheries management. There is some funding for basic research through NSF, but I will consider only the funding for fisheries management. Fisheries management is widely perceived to have failed in the US, and failed in many ways, with the symptoms being (1) overfishing and loss of potential yield, (2) over-capitalization and loss of economic potential, (3) discarding and loss of potential food products, (4) by-catch of non-target species and (5) habitat destruction by fishing gear. Before determining the appropriate allocation of resources to different fisheries management problems, we need to understand how well we are doing in these areas. In some of the areas reasonable hard numbers are available. From the NMFS annual report "Our living oceans" we find that estimated loss in fish yield due to overfishing is about 14% of the total potential yield (a score of 86%). In contrast other estimates of the economic performance of US commercial fisheries give an estimated of \$2.9 billion in excess expenditures out of a landed value of \$3.5 billion (a score of 17%). I don't know of any quantitative rankings of discarding, by-catch or habitat destruction, but I very much doubt that we are losing more than 20% of potential yield (biological or economic) due to any of these factors. The basic US fisheries problem is that we have an incredibly inefficient economic system caused by the regulatory mechanisms we have imposed. This has led to gross overcapitalization in most fisheries, which in turn leads to overfishing, producing a 14% loss in possible fisheries biological yield and a much large loss in economic yield.

Who Decides

Within the US most decisions regarding allocation of funds are made by Congress, largely through line-item allocation in the NMFS budget or other components of the federal budget. The current NAPA/NRC review of the NMFS funding situation will undoubtedly provide significant light on the details, but it is very clear in the regions that if you want to affect funding for fisheries research you do so in Washington D.C. primarily through your Congressional representatives. Within regional or even national offices of NMFS there is little discretionary money to be allocated based on an independent evaluation of needs, rather most funds are tied directly to specific problems. Thus the scientists, managers and industry representatives in an individual fishery cannot determine what research programs are funded except by going to Congress.

Who Pays

Within the US the dominant funding source for fisheries management research is NMFS through Congress, with States making important contributions. Again there is little real planning involved in data collection programs, but rather the politics of the moment. There is little if any effective cost recovery of research, management and data collection costs from commercial users, and very modest license fees for recreational users.

How is it done elsewhere?

The situation in the US is similar to other countries, but differs radically from many of the more progressive countries where fishery managers and industry representatives determine research expenditures on a fishery by fishery basis, and most of the costs are recovered from the commercial industry. This model, local control and industry cost-recovery is found in Australia, New Zealand and Chile. As an example, in New Zealand there is an annual round of research consultancy in which all the scientists, managers, industry and conservation groups meet to review the research and data collection programs for each fishery, and make recommendations about which programs to operate in the next year. In Canada it is a combination of the two models, where for many fisheries centralized government control dominates, but in other Canadian fisheries there is local control and cost recovery.

How much is should we spend?

In the 1980s the budget of the Canadian Department of Fisheries and Oceans was roughly comparable to the landed value of all fish in Canada. If we view fisheries as a form of economic activity that should be producing food, employment and wealth for a nation then we need to look carefully at how much we should spend on data collection and research. It is well recognized that the yield from a fishery will increase as the information about that fishery increases, but that there is a diminishing benefit to additional data collection and research. Computer simulations have been used to determine the yield increases from adding new data collection programs or increasing the precision of existing ones.

In many of the countries and international agencies I have worked, there is an emerging consensus that somewhere around 5-10% of the landed value of the fish products would be an appropriate cost for management, enforcement, research and data collection. If we use \$3.5 billion as the value of US fish products, then US expenditures should be on the order of \$200-\$400 million. The 2002 NMFS budget request was for \$734 million – is this too much or too little. We must recognize that much of the NMFS budget goes into response to lawsuits, and issues associated with lower 48 salmon (which have very little landed economic value). Further US marine recreational fisheries are highly valuable, although regulated to a great extent by States. States also spend a considerable amount on marine commercial fisheries. Given all these considerations, the total expenditure may indeed be in the range of that considered reasonable in other places, but because of our institutional structure, and in particular the many legal actions, it is difficult to compare to other places

Who does the science?

In the US almost all science is done by NMFS and the States. There is a growing trend towards cooperative industry/government data collection programs and in a few fisheries consultants working for the industry participate in the stock assessment process. Other countries, again Australia, New Zealand and Chile have to differing extents privatized research, letting much of the work be done by contractors, although in all cases former government laboratories continue to compete for and receive most of the contracts. Nevertheless there is an increasing awareness that methods over than dedicated government research laboratories may be more effective means or providing science to fisheries management. I have worked in fisheries in New Zealand and Canada where most of the data collection, analysis and stock assessments were done by industry funded consultants. Many NGO's have expressed concern that this is letting the "fox guard the hen-house". The counter arguments include a highly publicized paper by several Canadian scientists documenting how supposedly "independent" government science was politically influenced, and a recognition that in the right institutional settings long term sustained yield is in the commercial industries best interest and they support it and pay for it.

The role of science in management

We must recognize that fisheries management is far more than setting catch levels, indeed I believe that the major problem in US fisheries management is that we generally think that regulating catch levels **is** fisheries management. Fisheries management also involves determining who is allowed to fish, and allocating the catch among users. Science has played little role in this process, and in general questions of access and allocation are dealt with by councils. Councils have strong representation from vested interest user groups – and thus would seem inappropriate institutions to make allocation decisions. Science has a role to play in allocation decision in evaluating what methods of allocation have led to desirable outcomes; science will not tell you who should be allocated the catch.

With respect to allowable catches, there is no "scientific" answer about what catch should be allowed. Decision makers must specify the objectives of fisheries management explicitly before scientists can determine what catch level is appropriate. In any system where scientists make catch recommendations either they are making a number of value judgments or they have explicit objectives provided for them. Many scientists are now recommending that fisheries be operated on fixed "management procedures" in which the allowable catches are determined by a set of pre-defined rules. The role of scientists is to evaluate the consequences of different rules, the government would determine which rules meet conservation criteria, and the industry would choose which rules they prefer among those that meet the government conservation criteria.

Ecosystem management

Ecosystem management means different things to different people. As it is now being implemented in the US councils I work with, ecosystem management essentially means that we recognize that fishing affects more than the species that are targeted, and fishery regulations need to consider impacts on these other species. There are a number of developing quantitative tools

for ecosystem management that explicitly consider the trophic interaction within the ecosystem. These tools are still early in development and I suspect are unlikely to become useable tools simply because they demand so much data that is usually not obtainable.

I prefer a broader sense of ecosystem management. We are managing fisheries, that include the species of interest, the ecosystem in which these fish live, the fishing fleets of interest, and the human ecosystems in which they live. Managing fisheries is managing people more than managing fish. Most of our fisheries failures have resulted from not recognizing how people respond to regulation changes. Thus overcapitalization and the “race for fish” are unintended consequences of management decisions, just as much as by-catch of mammals or birds is an unintended consequence of putting nets or hooks in the water. I believe that all parties involved in fisheries management, including commercial fishermen and conservation oriented NGO’s want the same thing, sustained fishing communities and sustained marine ecosystems.

Recommendations

I recommend that the Commission:

Recognize that fisheries management is much more than setting catch levels; provide for a method other than councils to make allocation decisions and find a way to break the “race for fish”.

Recognize that if we can make US fisheries profitable, then the fishing industry can pay for research and management costs.

Let local fishery managers, scientists, industry and councils make the decisions about what research programs to conduct.