UNDERSTANDING THE SOCIAL AND ECONOMIC BENEFITS OF BILLFISH ANGLING

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ABSTRACT

A more complete human dimensions understanding of recreational billfish fisheries is emerging from two recent studies in the U.S. Western Atlantic Ocean (Fisher and Ditton 1994) and in Puerto Rico (Ditton and Clark 1994). This paper will summarize new knowledge regarding the social and economic benefits of billfish angling since an earlier paper (Fedler and Ditton 1990) presented at the 1989 International Billfish Research Symposium. Also, this paper will give emphasis to existing as well as emerging research protocols for collecting human dimensions information from anglers and using it for fisheries management decision making purposes. Implications of new understandings for research, educational efforts, conservation organizations, the recreational fishing/tourism industry, and economic development will be discussed.

INTRODUCTION

In 1988 several human dimensions researchers were invited to present papers at the International Billfish Research Symposium in Kailua-Kona, Hawaii. Rockland (1989) provided an overview of the economics of recreational billfish fisheries. He carefully differentiated economic valuation from economic impact in order to guide future data collection efforts relative to these two concerns. Orbach (1990) provided a policy overview and analysis to enhance understanding of regional differences in billfish management and the Fishery Management Plan (FMP) for Atlantic Billfish which was about to be approved by the U.S. Secretary of Commerce after many previous efforts by one or more of the five regional fishery management councils in the area.

Maiolo (1990) provided results from a pilot study on the social organization of tournament billfish anglers (n=140) in the U.S. Atlantic. Tony Fedler and I were asked to provide a review of previous human dimensions research on the recreational billfish fishery.

After Fedler and Ditton (1990) summarized what little was known about billfish anglers and their fishing experiences and some of the limitations of the data, they developed a social and economic research agenda in support of billfish

conservation. They specifically directed their remarks to non-governmental interests. They did so because of 1) the relatively small number of billfish anglers compared to other fisheries, 2) the lack of allocation disputes once the FMP was approved, and 3) the lack of human dimensions perspective in both research and management among the federal fisheries management community (i.e., they weren?t devoting resources to support human dimensions research in other fisheries; why would they do so for billfish?). Fedler and Ditton (1990) offered several examples where social and economic data were used effectively to support resource allocation decisions, enhanced research funding, and conservation decisions. Specifically, they noted that:

Constituency groups need to explore ways to be more effective if they are to coax government to exercise fully its responsibilities for management of common property fisheries resources. Instead of relying on ethical and biological arguments, those who represent billfish anglers in political decision-making need to recognize the imperative of using well-grounded constituent and economic arguments. Biological points made by anglers can be (and often are) dismissed by management agencies as naive, anecdotal, uninformed, and not based on data. Legislators often do not understand biological arguments as well (Fedler and Ditton 1990:266).

They suggested that to the extent private groups, (i.e., The Billfish Foundation, International Game Fish Association, Game Conservation International, National Coalition for Marine Conservation, and the Coastal Conservation Association among others) achieve a strategic understanding of billfish anglers, they will have a better chance of securing favorable attention to and necessary funding for billfish conservation and management matters. Overall, Fedler and Ditton (1990) saw greater social and economic understandings as the prerequisite first step to additional funding for and implementation of further research and management efforts. Instead of doing social and economic research after other biological research has been completed (it is never completed!) as a first priority in support of resource protection, they suggested a radical alternative; that attention be devoted first to social and economic research to provide widespread understanding of the human benefits provided by this fishery and their value so the need for additional biological research, monitoring, and law enforcement efforts is abundantly clear.

In response to this challenge, The Billfish Foundation (TBF) of Fort Lauderdale, FL with financial commitments from many other groups and individual anglers, has supported two social and economic studies of billfish anglers. The first focused on tournament billfish anglers in the U.S. Atlantic and was undertaken to blunt legal challenges at the time to the FMP for Atlantic Billfish (Ditton and Fisher 1990; Fisher and Ditton 1992). The second study focused on those participating in

sixteen billfish tournaments in Puerto Rico in 1991-1992. This included those who resided in Puerto Rico as well as those non-residents who traveled to Puerto Rico to participate in billfish tournaments. We were interested in all of their billfish fishing activity over the previous twelve months, not just their tournament participation (Ditton and Clark 1994). This study was conducted in partnership with the Puerto Rico Sport Fishing Association, the University of Puerto Rico Sea Grant College Program, and the Club Nautico de San Juan International Billfish Tournament.

Recently, with funding support from The Billfish Foundation, we initiated social and economic studies of the recreational billfish fisheries in the Cabo San Lucas/Mazatlan area of Mexico and along the Pacific coast of Costa Rica. Whereas many of the research questions are the same as in the previous studies, the focus in the two new studies will be on charterboat billfish fisheries. By using a different sampling frame than previously, we expect to better understand angler diversity within this fishery.

Against this backdrop of social and economic studies, there have been continuing challenges for billfish management over the past six years in the U.S. and abroad. Whereas the FMP for Atlantic Billfish reserved the resource for the traditional recreational fishery (the rationale was to optimize the social and economic benefits to the nation), problems have arisen which threaten billfish stocks. Commercial by-catch of billfish has become so ubiquitous as a source of mortality that The Billfish Foundation and other groups have recently proposed four specific time and area longlining closures in the U.S. Atlantic. These were proposed to the National Marine Fisheries Service in order to curtail excessive billfish mortality in areas with high billfish abundance within the U.S. Exclusive Economic Zone (EEZ). Elsewhere commercial by- catch (even where prohibited under law) as well as occasionally directed fisheries threaten the abundance of billfish populations, billfish catchability by anglers practicing catch and release, and fisheries benefits documented previously in socio-economic studies. These cases point to the need for non-governmental constituency groups to make effective use of available social and economic data in support of billfish conservation. In the U.S. jurisdiction, for example, managers are charged with managing for optimum yield under the Magnuson Fishery Conservation and Management Act (16 U.S.C. 1802): "..that amount of fish which will provide the greatest overall benefit to the Nation, with particular reference to food production and recreational opportunities; and which is prescribed as such on the basis of the maximum sustainable yield from such fishing, as modified by any relevant economic, social, or ecological factorF This mandates data collection that enables such determinations.

Other nations with traditional commercial fisheries must encourage new

fishing practices, gear modifications, and other actions (as needed) if they are to continue to enjoy the tourism benefits associated with recreational billfish fisheries. With careful attention to recreational and commercial fisheries, the goal is to find a way for both fisheries to produce a sustainable flow of benefits to their respective constituencies and nations. To the extent that overfishing occurs as predicted in the commons dilemma, however, the social and economic benefits associated with the recreational fishery and the related tourism industry may be threatened. Since these benefits often far exceed those associated with commercial fisheries, this situation may necessitate a 'good hard look' at what is in the respective nation?s best long term interest. While overfishing of billfish by commercial fisheries produces social and economic damages for both recreational and commercial fisheries, losses from the recreational fishing activity forgone will be the greatest by far.

METHODS

In the following sections, this paper will deal with: 1) recent understandings of the human dimensions of billfish fisheries that have emerged since the Second International Billfish Symposium in 1988, 2) research questions that remain to be answered, and 3) a discussion of future applications of human dimensions research elsewhere.

Some Recent Understanding

Since the Second International Billfish Symposium in 1988, we have learned much more from our studies in the U.S. Atlantic (Ditton and Fisher 1990; Ditton and Clark 1994) about the socio-psychological benefits billfish anglers seek from their fishing experiences, how these are quantified in addition to fishing trip monetary expenditures to understand the present use value of billfish fisheries, the ties between the recreational billfish fishery and the boating industry, and catch and release rates among billfish anglers.

In comparison with fourteen other angler groups, billfish tournament anglers and two other angler groups rated most fishing motivation items higher than average overall (Fedler and Ditton 1994). In particular, billfish anglers were in pursuit of large fish, with the challenge or sport of fishing ranked most important. The extent and pattern of benefits sought from recreational fishing by this group of anglers vis-a-vis other angler groups help to explain the extent to which anglers value their billfish fishing experiences.

The economic value of the recreational billfish fishery was not established adequately in the Atlantic FMP for Billfish. Previously, the focus was on anglers? expenditures as a measure of the minimum value of recreational fishing trips and as a way to understand local and regional economic impacts. However, angler

expenditures are not a valid measure of a trips economic value as they do not represent an addition to the welfare of the nation (Huppert 1983).

Furthermore, a fishing trip has much greater value than the costs associated with accessing and using a fishery resource. Estimating the economic value of the socio-psychological benefits sought from billfish fishing (consumer?s surplus) can be ascertained using contingent valuation methods (CVM) which measure willingness to pay in excess of trip expenditures (Huppert 1983).

As a result of the two social and economic studies of billfish anglers, we have differences in trip expenditures, expenditures per day, and consumer?s surplus. Trip expenditures ranged from $711 for resident billfish tournament anglers in Puerto Rico to $1,600 for billfish tournament anglers in the U.S. Atlantic and $3,945 for non-resident billfish tournament anglers fishing in Puerto Rico. Per day trip expenditures averaged $374, $618 and $1,052, respectively. Likewise, Fisher and Ditton (1992) reported that billfishing expenditures (total expenditures per trip, days fishing per trip, and cost per day) varied by region within the U.S. Atlantic study area (Caribbean, Gulf of Mexico, South Atlantic, and Mid Atlantic regions). Consumer?s surplus or willingness to pay above current expenditures for a billfish trip ranged from $262 in the U.S. Atlantic overall to $549 for resident and non-resident billfish anglers in Puerto Rico. The current use value of the recreational billfish fishery in the U.S. Atlantic (including Puerto Rico) was an estimated $181.4 million (Fisher and Ditton 1992). The current use value of the recreational billfish fishery in Puerto Rico was estimated to be $43.9 million or about 25% of the current use value of the U.S. Atlantic.

In an effort to better understand the full extent of the sport fishery industry in Puerto Rico, ties between the recreational billfish fishery and the boating industry were investigated by Ditton and Clark (1994). They found that 50% of the population of tournament billfish anglers in Puerto Rico (n=1,475) had purchased their boats in the Commonwealth. An average angler?s expenditure for a boat (and motor) would be misleading since 34% spent over $160,000 and 38% spent less than $40,000. Furthermore, fuel sales by tournament billfish anglers in Puerto Rico (for tournament and non-tournament billfish trips) were estimated at about $3.2 million in the previous twelve months. Also, the population of billfish tournament anglers spent a total of $16.6 million in Puerto Rico on boating-related products and services in the previous twelve months. Most anglers made boat-related expenditures in Puerto Rico for 1) Engines (parts, repair costs, oil, replacement tanks, drive unit, and maintenance); 2) Other maintenance (work, paint/coatings, haul-out, and dry dock fees, cleaning costs); and 3) Boat insurance. Average expenditures for the population of tournament billfish anglers in Puerto Rico were $2,443, $2,485, and $2,604, respectively.

Finally, percentage of billfish caught and released would appear to be increasing, an indicator that catch and release is becoming the social norm among billfish anglers. In a 1977- 1978 survey of the billfish fishery, Rockland (1989) indicated anglers reported releasing the following portions of the fish they catch: 1) Blue Marlin (63%), 2) White Marlin (70%), and 3) Sailfish (74%). Fisher and Ditton (1992) estimated anglers released 89% of the billfish caught (includes tournament and non-tournament caught fish). This compares quite well with an estimated 87% release rate for non-resident billfish anglers in Puerto Rico. Although apparently less committed to the catch and release ethnic, resident billfish anglers had an estimated release rate of 72%.

Remaining Research Questions

No listing of the total population of billfish anglers is available for the United States or any of its political subdivisions for sampling purposes. This is also the case elsewhere. As the "best available" alternative, participants in billfish tournaments along the U.S. Atlantic (Maine to Texas including Puerto Rico and the U.S. Virgin Islands) and specifically in Puerto Rico were sampled as a proxy for billfish anglers. Whether they are representative of billfish anglers in general remains to be seen. Billfish angler studies underway at Woods Hole Oceanographic Institute and Rutgers University that rely on field intercept designs may provide a basis for comparison. Also, efforts need to be made to study other groups of billfish anglers (i.e., charter and private boat fisheries) besides those who participate in billfish tournaments. The social and economic studies currently underway in Mexico and Costa Rica both involve sampling the population of anglers taking billfish trips on charter boats. These efforts will help provide insight to the diversity of anglers we expected to find within the billfish angler population.

From the study of resident billfish tournament anglers in Puerto Rico, we know that almost one-third went fishing outside of Puerto Rico in the previous twelve months (Ditton and Clark 1994). This introduces the matter of substitution; as billfish catchability declines in a particular area or if policies are not pursued to maintain the highest availability of billfish, for example, anglers may seek alternative billfish fishing locations. In upcoming social and economic studies of billfish fisheries in Costa Rica and Mexico, substitutability will be investigated further. In particular, we are interested in who is likely to substitute an alternative billfish fishing location and which locations are viewed as substitutes and why.

Whereas previous social and economic studies have focused on angler expenditures for billfish trips, little attention has been directed toward the indirect and induced impacts of these expenditures. The purchase of goods and services by non-local billfish anglers transfers money to local merchants, who in turn spend the

money for goods and services necessary to maintain their businesses. This re-spending is an indirect benefit to the local tourism economy resulting from billfish angling. This money may be spent again locally, or used to purchase goods and services from outside the local economy. Efforts to calculate the economic impact of billfish angling by tournament participants in Puerto Rico were frustrated by several constraints: 1) a single tourism multiplier was available rather than multipliers for each area of angler expenditure, 2) rapid leakage of money from Puerto Rico to the mainland U.S. due to its economic dependence, and 3) a lack of information on which items (besides airfare) were purchased in Puerto Rico by non-residents (Ditton and Clark 1994). Hopefully, future studies of the local and regional economic impacts of billfish fisheries will be able to overcome the aforementioned constraints.

DISCUSSION

The collection and use of social and economic data in support of resource allocation decisions, enhanced research funding, and conservation efforts has wide application beyond the billfish fishery. This approach can and should be used by constituency groups regarding any other fisheries where conflicts exist. Only with this type of data will conservation groups and tourism- related businesses be able to establish the economic value of the tarpon fishery in Costa Rica, for example. Perhaps when government understands the recreational use value of the tarpon resource, and the annual level of angler expenditures and their local and regional impacts, appropriate fisheries management measures will be taken. As Richard Farren (1994) said in his article about nearshore recreational fisheries in Florida and the value that could be lost/forgone by not taking action to restrict commercial netting in nearshore waters, "It's the Economy, Stupid!" Hopefully, by making social and economic arguments instead of relying solely on biological and environmental arguments, decisionmakers will better understand the need for conservation and prudent management.

This type of research depends extensively on the development of partnerships. First, a partnership of private effort was required to secure funds in support of billfish research projects.

Funding support came from billfish anglers and the various groups that represent them. Without this support, it is unlikely government would have devoted much funding to billfish research or social and economic studies, for that matter. In the United States, for example, social and economic research has lowest priority for government funding in support of fisheries management. Second, extensive partnerships are necessary to conduct this type of work. Our recent project in Puerto Rico would never have been completed without local assistance and support with

every aspect of the project. We are most appreciative of this assistance. Finally, the social and economic data collected needs to be used effectively by leaders in the billfish community in support of protection and enhancement of billfish stocks through new regulations on commercial fisheries, better law enforcement, and more attention to biological research in support of fishery management. To this end, The Billfish Foundation and Marlin Magazine agreed recently to devote sixteen pages per quarter to reporting on TBF programs including results from research projects they sponsor. This approach will disseminate research results widely in support of private sector involvement in fisheries management decisionmaking. Likewise, TBF has initiated a Caribbean Council to foster discussions of the economic importance of wise management of recreational billfish fisheries between angler representatives in the Caribbean and their respective governments.

And, finally, there is the matter of how social and economic data is used by U.S. representatives (and others) to the International Convention for the Conservation of Atlantic Tunas (ICCAT) in support of billfish conservation. To date, data on the social and economic value of the U.S. recreational billfish fishery have not been taken forward to ICCAT deliberations by U.S. representatives. If it is not possible for U.S. fisheries officials to recognize the importance and leverage ability of these values and the imperative of promoting efforts to perpetuate these values, then alternatives need to be considered. Perhaps other nations (besides the U.S.) with an interest in billfish conservation and management are willing to take this perspective forward to ICCAT. This could lead to coalition building among interests committed to tourism economies and hence an optimum yield approach to billfish management and by-catch reduction.

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