

Marine Recreational Fishing Statistics: A Caribbean Basin Initiative

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Prior to 1970, there was almost no research conducted on billfishes by the National Marine Fisheries Service. Billfishes were not harvested commercially, they were considered a "wealthy man's sport", and recreational conservation organizations were few and poorly organized. Consequently, there seemed to be little need or interest in expending federal funds on this group of fish. In 1972, however, the Southeast Fisheries Center's Miami Laboratory began a program of research on billfishes that was concentrated around the collection of biological and statistical data from billfish tournaments and from non-tournament fishing for billfishes in the western North Atlantic, Gulf of Mexico, and Caribbean Sea. When the program began, it was felt that there would be a need for these data, but we had no idea how soon this need would develop or how important a role these data would play in planning management measures and identifying stock abundance problems in our billfish populations.

Several things happened in the 1970's that placed more and more importance on billfishes within the U.S. Catch data from the Japanese longline fishery that began operations in the Atlantic in the late 1950's became widely available and indicated that very large numbers of marlins and sailfish were being taken in the western Atlantic. In 1962, 1963, and 1964, for example, over 300,000 blue marlin alone were landed by this fishery in the western North Atlantic. Secondly, the U.S. became more and more involved in the International Commission for the Conservation of Atlantic Tunas (ICCAT), the organization responsible for international management and research on tunas and billfishes in the Atlantic. Thirdly, major conservation groups were organized and began to express their concerns to the Federal Government over the status of billfish stocks and the high catches by the Japanese fishery. Finally, and probably most important, the Fishery Conservation and Management Act was passed in 1976 and the Regional Fishery Management Councils were organized and began preparing Fishery Management Plans (FMPs) for certain groups of fishes. Billfishes were one of the first groups they addressed.

This is our fifteenth year of collecting catch, effort, and biological data from tournament and non-tournament fishing for billfishes. Although most of our data are from our own waters, we have, through the kind support and assistance of the Governments and Fisheries Agencies of the Bahamas, Jamaica, Mexico, and the Commonwealth of Puerto Rico, been able to sample tournaments at various areas throughout the Caribbean as well. Our efforts outside our own waters, however, are limited and constitute only a small portion of the total effort expended in recreational fishing for billfishes in the Caribbean. More data are required from other areas in the Caribbean to provide a more complete picture of the billfish fishery.

Billfishes are an extremely valuable natural resource available as a common property to almost all nations in the Caribbean. Major sport fishing centers are located at many different locations in the Caribbean. Established fishing areas in the western Bahamas, Cayman Islands, northern Venezuela, Virgin Islands, Puerto Rico, and off the Yucatan in Mexico are well known, however new areas are being developed, for example at San Salvador, Turks and Caicos Islands, and Treasure Cay in the Bahamas. In truth, almost any area in the Caribbean that is located near deep ocean waters has a great potential for a billfish fishery. The Caribbean is located in the center of the distribution range for marlins in the western North Atlantic and therefore has a high stake in any changes in stock abundance that might take place. As was pointed out above, the Japanese took over 300,000 blue marlin in three years from the western North Atlantic; over 100,000 were taken from the Caribbean area. Although the Japanese have substantially reduced their fishing in recent years in the Caribbean, nations are actively fishing for tunas and swordfish and although we have little information on their catch of billfishes, all indications are that it is quite high. There is, therefore, a continuing threat of a reduction in the abundance of billfishes that would seriously affect all fishing areas in the Caribbean and hamper any efforts to develop new ones.

I would like to propose that through GCFI we initiate a cooperative, Caribbean-wide, data collection effort for billfishes. After fifteen years we have solid evidence of the value and importance of these data, yet we have also been made aware of the pressing need to expand this effort into other areas that are within the distributional range of billfishes in the Caribbean, particularly the blue and white marlins. A brief review of our efforts and a look at some of the analyses of the data will emphasize the need for increase sampling throughout the Caribbean.

All of our data from both tournament and non-tournament fishing are obtained through direct interviews with either the angler or one of the crew members. We record not only the number of hours fished and the number of each species of billfish hooked during the day's fishing, but also data on bait used, wind velocity and direction, sea state, cloud cover, and the time of day of each hook-up. At present, however, due to fiscal and personnel considerations, we are making contingency plans to reduce the intensity and detail of our sampling and move into a more basic catch and effort retrieval system — a system that does not require individual interviews or a sampler to personally be present at a tournament.

At one time or another our sampling coverage has ranged from Block Island, off Rhode Island, to Port Isabel, Texas, all through the western Bahamas, and in Jamaica, Puerto Rico, the Virgin Islands, and Cozumel, Mexico (Figure 1). Our most extensive coverage is in the Gulf of Mexico where we have continuously sampled non-tournament fishing as well as tournament fishing at various major fishing areas around the Gulf coast. In recent years, we have also sampled intensively along the northeast coast of the U.S. for both tournament and non-tournament fishing. In addition to gathering catch and effort statistics, our samplers obtain basic biological data from each landed billfish. We have an extensive data base on length, weight, and sex of blue and white marlin throughout our sampling area. In recent years, our sampling has included the retrieval of various hard parts for use in our analysis of age and growth of blue

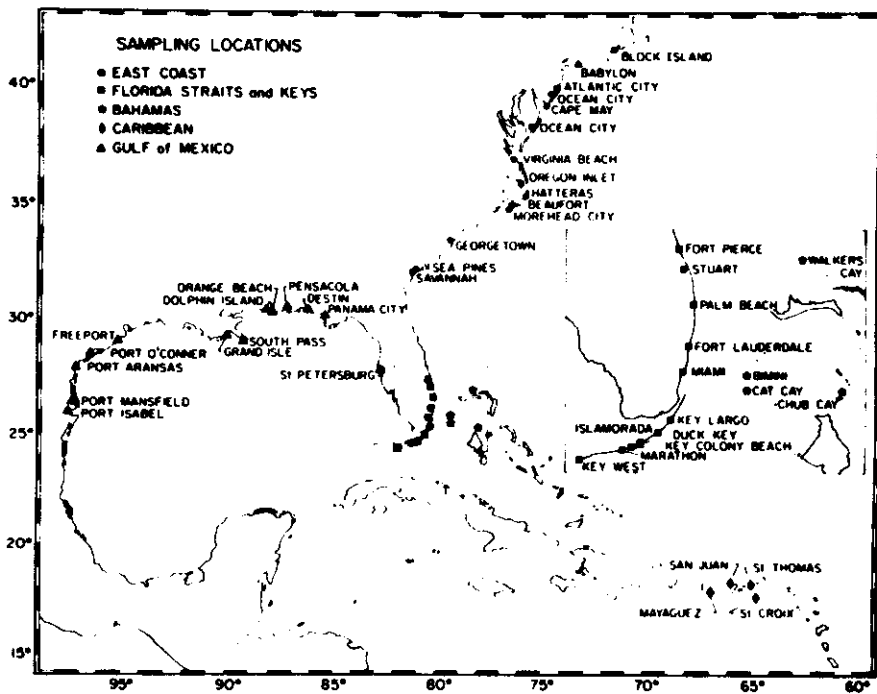


Figure 1. Locations where recreational fishing for billfishes has or is being sampled, 1972—1986.

and white marlin. Many billfish tournaments, however, are moving more and more into a release or a tag and release format.

Our Cooperative Game Fish Tagging Program which has been operating for over 30 years has provided us a great deal of information about the seasonal distribution and movements of blue and white marlin. Although we have limited recaptures of blue marlin, the available data indicate a year-round population of blue marlin centered in the Caribbean with mostly local seasonal movements and changes in distribution (Figure 2). We have, however, recorded two trans-Atlantic migrations of blue marlin from the Virgin Islands to the coast of West Africa. Both of these recaptures were made in the Gulf of Guinea by tuna purse seiners fishing for skipjack tuna.

We have recorded fairly large numbers of tag recoveries from white marlin. There appears to be two rather clear-cut migrational groups of white marlin. One group moves northward from its wintering grounds off Venezuela to its summering grounds off the mid-Atlantic coast of the U.S. (Figure 3). Another group moves from Venezuela to summering grounds in the northern Gulf of Mexico. Additionally there appears to be another group of fish that spends the entire year off Venezuela. It is clear, therefore, that like the blue marlin, the Caribbean is a center of abundance at least part of the year for white marlin.

Coverage of tournament and non-tournament fishing for billfishes has steadily increased over the past fifteen years (Figure 4). Most of this increase has been due to tournament fishing; partly due to an increased number of tournaments and partly to an increase in sampling effort. In 1984, for example, data were recorded from 107 tournaments. Figure 5 isolates our coverage in the Caribbean area and shows that by a wide margin, coverage in the Bahamas was greater than in any other locale. This clearly demonstrates the real need to increase data collection efforts throughout the Caribbean fishing area.

Figure 6 presents CPUE data for blue marlin from two major fishing areas in the Bahamas and demonstrates some of the interesting and informative analyses that can be performed when ample data are available. For fifteen years we have sampled basically the same tournaments at the same time of the year at Bimini/Cat Cay on the western edge of the Bahamas and at Chub Cay on the edge of the Tongue of the Ocean, some 70 miles from Bimini/Cat Cay. When we compare CPUE for blue marlin for these two areas, in eleven of the fifteen sampled years, CPUE has moved in opposite directions. When fishing has been good at Chub Cay, it has been relatively poor at Bimini/Cat Cay and vice versa. Not only have the trends been in opposite directions, but the magnitude of the movements has been similar, also. Only in 1977, 1983, 1985, and 1986 did the CPUE values move in a similar direction. This suggests that there is a single group of blue marlin that contributes to the fisheries in both areas. Although the average CPUE has remained fairly constant, indicating no significant overall change in abundance, significant changes in CPUE can result from differences in seasonal distribution of this group between the two fishing areas. These data also point out that 1986 was a very poor year in both of these areas with the overall average CPUE declining to a fifteen year low. This may very well reflect increased fishing pressures on these stocks from a number of different sources and underscores the importance of obtaining good catch and effort statistics to continue to monitor these trends.

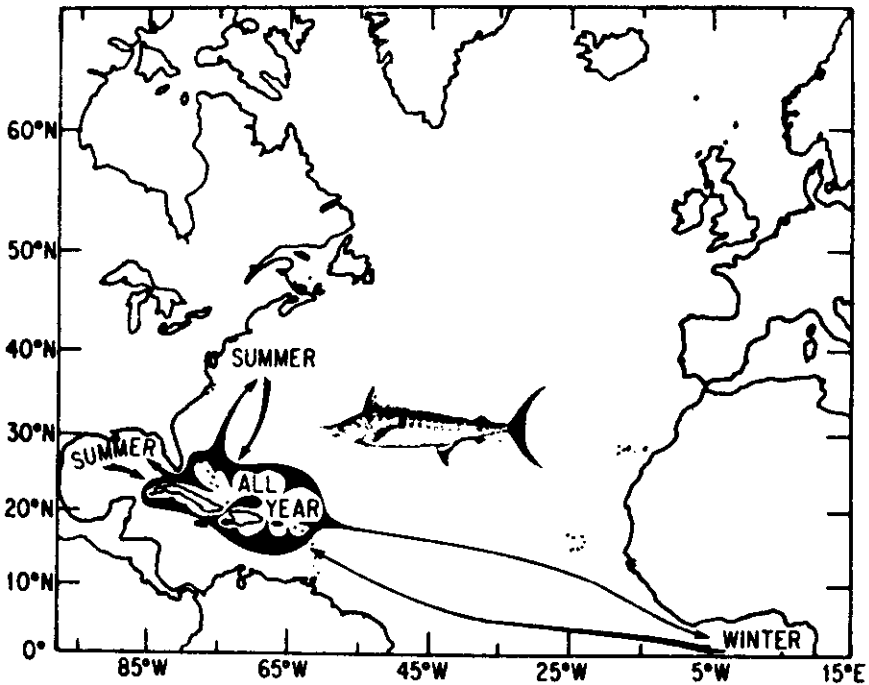


Figure 2. Hypothesized seasonal movements and distributions of blue marlin in the western North Atlantic based on tag recoveries, 1954—1986.

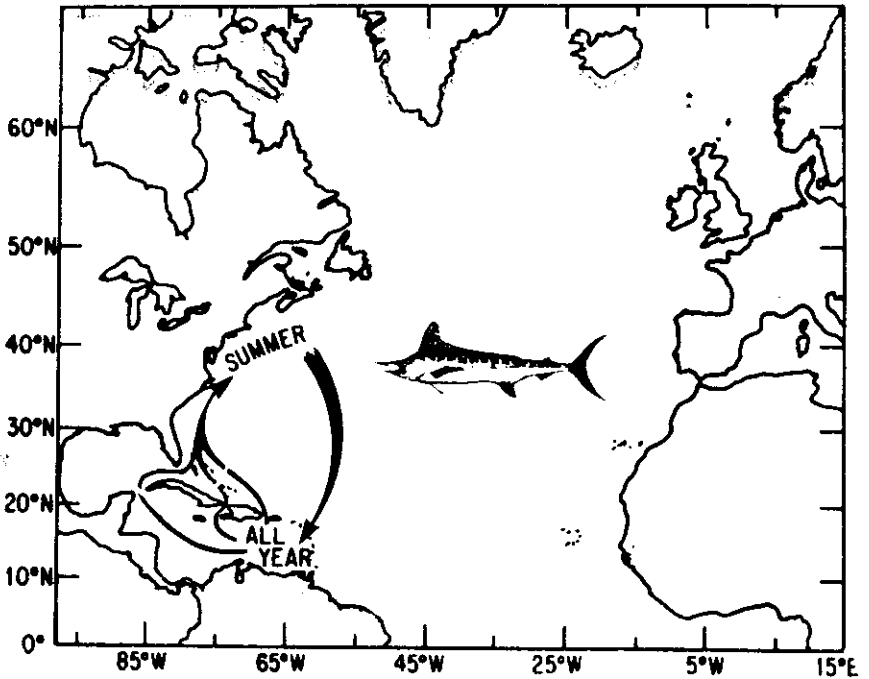


Figure 3. Hypothesized seasonal movements and distributions of white marlin in the western North Atlantic based on tag recoveries, 1954—1986.

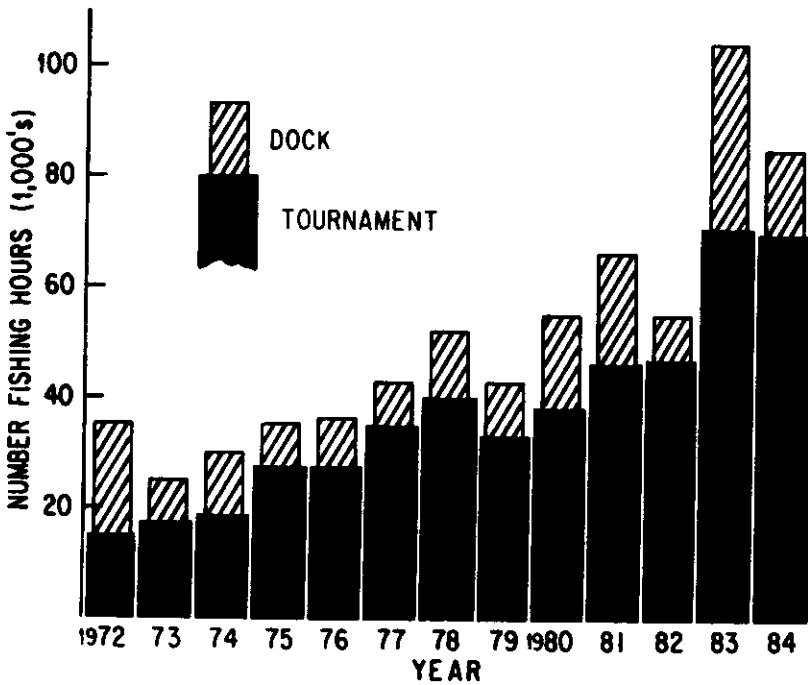


Figure 4. Number of fishing hours recorded by dock (non-tournament) and tournament sampling for billfish catch and effort, 1972—1984.

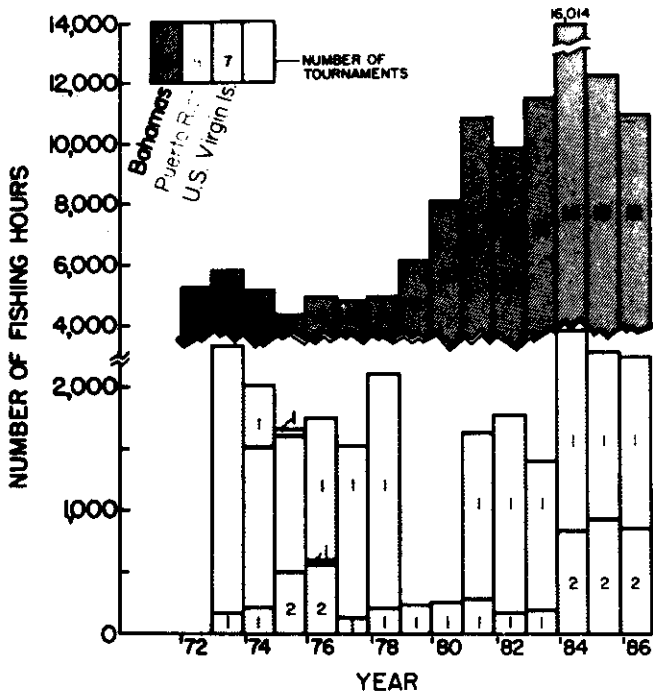


Figure 5. Number of fishing hours and number of tournaments sampled for billfish catch and effort at four major fishing areas in the Caribbean, 1972—1986.

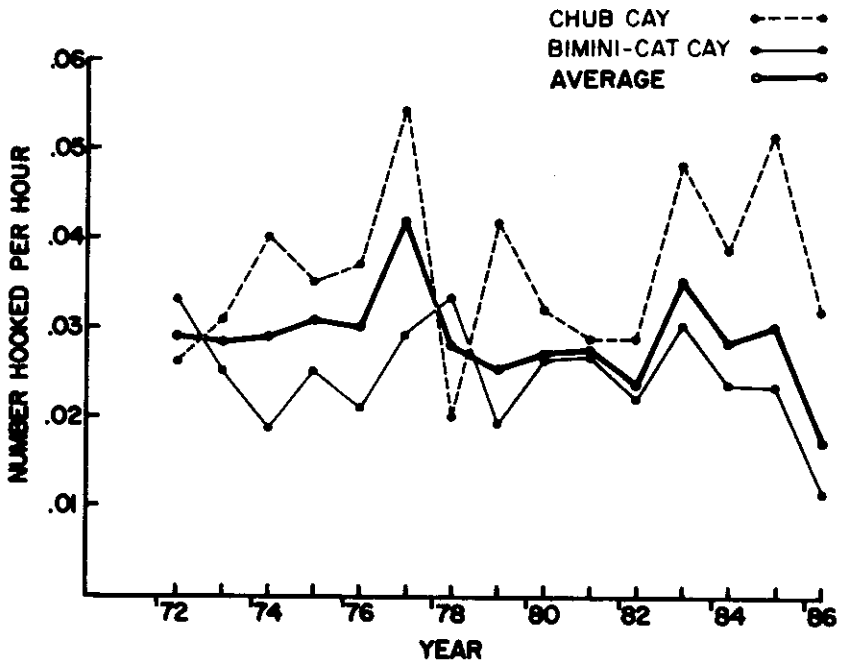


Figure 6. HPUE for blue marlin at two major fishing areas in the western Bahamas, 1972–1986.

Fishing for billfishes is certain to become more and more important in the coming years throughout the Caribbean and it is urgent we combine our efforts and pool our data to provide a central source for catch, effort, and biological data on billfishes in the western Atlantic. Through NMFS' longtime involvement with data from the recreational fishery for billfishes, we are prepared to serve as a clearing house for all billfish data collected through the Caribbean and to provide automated data processing (ADP) facilities.

These data will serve as a common data pool for all participants for use in developing or managing their fisheries. In addition, these data will provide a strong and complete basis for use within ICCAT to control the fishing of non-Caribbean nations and to clearly demonstrate the importance of this resource to the Caribbean.