An Overview of Recreational Fishing Tournaments in Puerto Rico

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ABSTRACT

Since 1999, Puerto Rico has been part of a study to acquire data of the most common fish catch in marine recreational fishing tournaments. Data was collected on marine fishing tournaments, which include offshore, bottom and shore fishing. Data regarding the fishing day was collected upon fishermen's arrival at the weigh station. There fish were measured, weighed, and fishermen were interviewed to determine fishing practices, effort, and areas used..

A total of 124 tournaments have been visited. Approximately 47,752.50 kilograms of fish were landed during tournament related activities. The main target species were Blue Marlin (*Makaira. nigricans*), Dolphinfish (*Coryphaena. hippurus*), Wahoo (*Acanthocybium solandri*). Shore and bottom fishing tournaments are few in numbers; several species of reef fishes are caught. Over the past three years, tournament-fishing activities in Puerto Rico increased: fishermen participation by 30.3 % and boats by 30.9 %.

Recreational fishing data collected over the past three years has allowed us to recognize patterns related to recreational fisheries activities (type of tournaments held, size of landed fish, and targeted species among others). The dolphinfish has been the species targeted the most during tournaments around the Island. During the past three years a total of 22,647 kg of dolphinfish followed by Blue Marlin with 14,556 kg were landed at Blue Marlin tournaments around the Island.

The current importance of fishing tournaments and the increased pressure from recreational fishers on the resource suggests a need for information on this of activity. In addition, the biology of target species and the impact tournaments have on marine ecosystems needs to be measured. This information would help in the creation of future management plans that will ensure a better fishing experience on the Island and maintain healthy fish stocks.

This paper emphasizes aspects from marine recreational tournaments including participation in fishing tournaments, weight, length, and sex ratio of fish caught, among others.

KEY WORDS: Recreational fisheries, tournaments

Torneos de Pesca Recreativa en Puerto Rico

Desde el 1999, Puerto Rico ha sido parte de un estudio que comprende la adquisición de data sobre los peces comúnmente capturados durante torneos de pesca recreativa marina. Se recopiló información sobre torneos de pesca marina; estos incluyen torneos de mar afuera, de fondo y orilla. Se recopiló información sobre la pesca del día una vez los pescadores llegaban a la estación de pesaje, donde los peces fueron medidos y pesados y se entrevistaron los pescadores para determinar las prácticas de pesca comunes, esfuerzo y áreas utilizadas.

Hasta la fecha, un total de 134 torneos han sido visitados. Aproximadamente 47,752.50 kilogramos de peces han sido abordados durante actividades relacionadas a torneos. Las especies principalmente buscadas lo fueron la Aguja o Marlin Azul (*Makaira nigricans*), el Dorado (*Coryphaena hippurus*) y el Peto (*Acanthocybium solandri*). Los torneos de fondo y orilla no son frecuentes y pocos tienen especies fijas. En la mayoría se abordan peces de arrecife y todos cualifican. Durante los últimos tres años, las actividades de la pesca recreativa en Puerto Rico han ido en aumento; particularmente la participación en torneos de pesca. La participación de pescadores ha aumentado en un 30.3% y él número de botes en un 30.9%.

La información adquirida a través de los años sobre los torneos de pesca recreativa en Puerto Rico nos ha permitido reconocer ciertos patrones relacionados a actividades de pesca recreativa (tipo de torneo, tamaño de los peces abordados y las especies predilectas entre otros). El dorado es la especie predilecta durante actividades relacionadas a torneos en la Isla. Durante los últimos tres años un total de 22,647 Kg de dorado seguidos por aguja azul con 14,556 Kg fueron abordados durante torneos celebrados en la Isla.

La importancia actual de los torneos de pesca y la presión que los pescadores recreativos imponen sobre el recurso pesquero hace necesaria la información sobre este tipo de actividad. Además, la biología de las especies predilectas para pescadores recreativos y el impacto que estos representan sobre el recurso pesquero debe ser estudiado y medido.

Este artículo hace énfasis en aspectos que caracterizan los torneos de pesca recreativa, incluyendo la participación en torneos de pesca, peso, medidas y razón de sexo de los peces capturados entre otros.

PALABRAS CLAVES: Torneo, pesca recreativa

INTRODUCTION

Over the past 50 years Puerto Rico has been recognized as one of the most important areas for recreational fishing (Pérez et. al. 1992). In 1962, research was conducted on some aspects of recreational fisheries in Puerto Rico, being billfish the most studied group (Erdman 1962). In 1972, the Southeasst Fisheries Center Miami Laboratory, began 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 (Beardsley 1986).

Commercial fisheries activity has been monitored in Puerto Rico since 1967 under the Commercial Fisheries Research and Development Act of 1964 (Matos-Caraballo 2002). The Fisheries Statistics Program was implemented on 1967 under the Commercial Fisheries Research Act (PL 88-309) to collect data on commercial fishery. This information provides necessary scientific information on the island's fishery resources and provides statistics for management purposes Matos-Caraballo 2002).

In 1983 and 1984, the National Marine Fisheries Service conducted a similar study on billfish biology during recreational fishing tournaments in Puerto Rico. This research was done with no concrete idea of the importance of this data and what an important role these data would play in planning management measures and identifying stock abundance problems in billfish populations (Beardsley 1986). In 1992, an investigation on dolphinfish (*Coryphaena hippurus)* biology was done using fishing tournaments for data collection (Pérez et.al. 1992). The economic importance of recreational fishing in the island has been documented in the past, but aspects of the biology of fish caught during tournaments have been neglected (Clark et. al. 1999a). In addition, no data addressing recreational fishing activities has been consistently gathered in the past.

In 1999, the Department of Natural and Environmental Resources through project F-42.3 began research on recreational fisheries again in Puerto Rico. Data collection for project F-42.3 started on January 2000, some data from 1999 was obtained and included in the analyses. A standardized data collection method was created using Microsoft Access (2000)© for marine recreational fishing tournaments.

The goals of project F-42.3 were to collect and analyze of biostatistical data that characterizes fishing tournaments in Puerto Rico, determine take and releases by kilogram by species and to determine catch per unit effort (CPUE) for each tournament and for target species.

MATERIALS AND METHODS

When project F.42.3 started in 1999 no standardized data collection method was available for recreational fishing tournaments in Puerto Rico. Most of the data on recreational angling was collected was through mail surveys, therefore the real tournament activity has not been measured nor analyzed. This gave an opportunity to develop a database that would help gather basic fishing effort information from monitored tournaments and therefore enable the characterization of recreational fishing tournaments on the Island. When designing the database we asked ourselves some questions:

i) When/where are tournaments held?
ii) How many boats/fishermen are participating in the tournament
iii) How many hours are they fishing?
iv) Where are they fishing?
v) What are they looking for? (E.g., target species for the tournament).

These questions helped us to have an idea of the information needed for the analysis of tournament activities. A database was created using Microsoft Access 2000©.

Project personnel called marinas and anglers' associations throughout the Island, and participated in the Puerto Rico Sport Fishermen Association (PRSFA) annual meeting. With the information obtained a tournament calendar was developed. The Department of Natural and Environmental Resource's personnel contacted tournament organizers to determine the arrival time of fishermen and the weighing period for the tournament. During the first fishing day, the number of participants, boats, the entry fee of the activity, as well as a copy of the rules of the tournament were requested for the records.

Fishermen were contacted upon their arrival at the weight station; there they were interviewed regarding fishing for the day. The following information was obtained:

i) Number of people fishing,
ii) Time spent fishing,
iii) An estimate of the fishing location,
iv) Fish species boarded,
v) Number of tag/releases, and
vi) Fish condition at release (e.g. mutilated healthy, dead etc.).

When fish were brought to the weight station; they were measured and weighted to a millimeter (mm) and a kilogram (kg) of precision. All measurements mentioned refer to fork length (FL). For billfish, measurements were taken following procedures described in the Code of Federal Regulations CFR 635.2; measurements were taken of lower jaw fork length (LJFL). When bycatch was not brought to the weight station, our personnel went to the dock area to measure and weigh the available specimens.

DATA ANALYSIS

The information was annotated to determine size and weight frequencies by species. These data was used to determine Catch per Unit Effort (CPUE) for takes and for the fishing activity. From the data collected, catch per unit effort (CPUE) was determined using the following formula:

$$\text{Catch Per Unit Effort} = \text{CPUE} = C/f$$
$$\text{Catch} = C = \text{Number of Fish}$$
$$\text{Fishing Effort} = f = \text{Number of Boats} \times \text{Time Spent Fishing}$$

RESULTS

A total of 124 fishing tournaments were visited since 1999 (Figure 1). Approximately 58,000 boats and personal watercrafts were registered as active at the Navigation Commissioners Office. Of these, a total of 5,132 boats (8.88 % of registered boats) participated in tournament related activities.

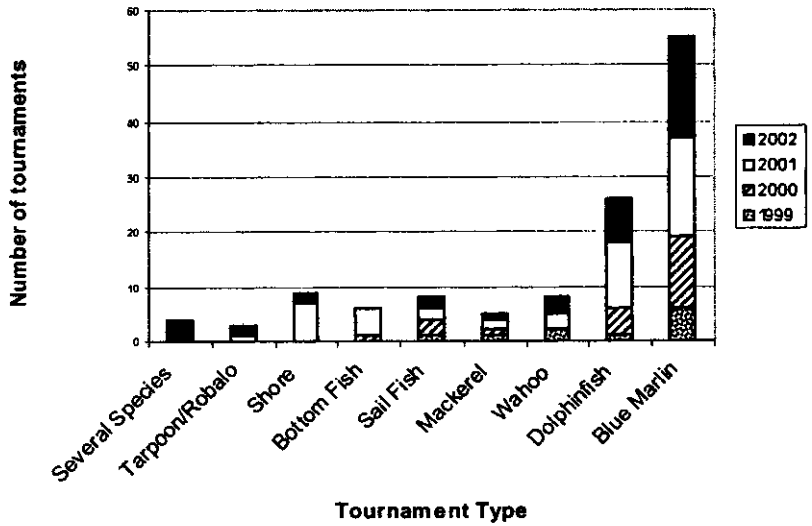

Figure 1. Sampled fishing tournaments (1999 - 2002)

As mentioned above a total of 5,132 boats (n = 124 tournaments, mean = 28.14 ± 28.14) and 13,915 fishermen (n = 124 tournaments, mean = 110.4 ± 112.18) participated on the tournaments around the island.

In 2001, a tournament fee was requested by the organizers. Of the 124 tournaments visited, two were sponsored by the Sports and Recreation Department of each town, which were free. From the data collected a total of US $865,615 were collected as tournament fee (n = 46 tournaments of 124 tournaments). The average entry fee for the years of study was US $291,938 (n = 46 tournaments of 124 tournaments).

The months of March and August had the highest number of fish boarded during tournaments; this coincides with dolphinfish tournaments and the peak of Blue Marlin tournaments, in August. (Figure 2). A total of 47,752.50 kg of fish were measured over the three years of sampling fishing tournaments. The year with the highest total weight was 2002. The difference in total weight over the first two years is mainly due to increase sampling effort. (Table 1) Dolphinfish were the most boarded with 26,291 kg of the total weight, followed by the blue marlin with 16,590.36 kg (Table 1). For these two species, size frequency distribution of the boarded fish was similar for the four years of data. Dolphinfish specimens range was 900 - 1000 mm and for blue marlin 2450 - 2667 mm.

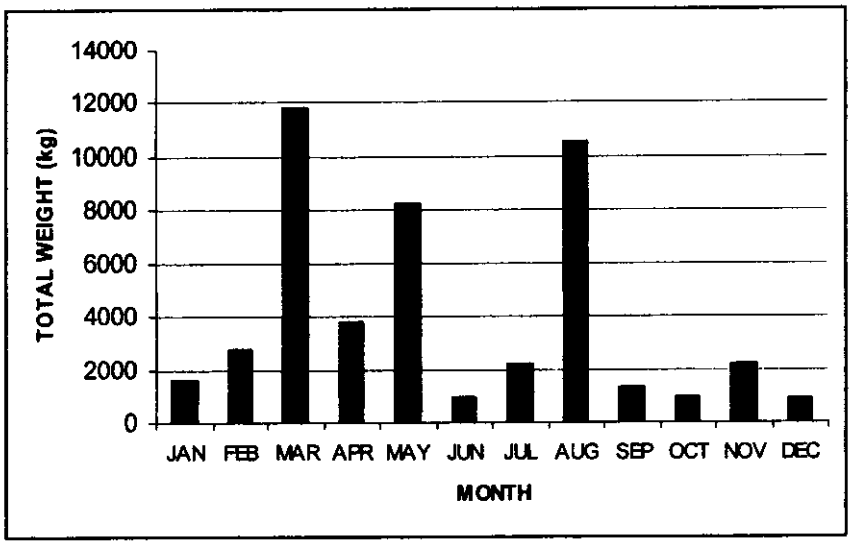

Figure 2. Total weight of boarded fish by month (1999 - 2002)

Table 1. Total weight of sampled fish in fishing tournaments (1999-2002)

Species	1999	2000	2001	2002	Total Weight (kg)
Blue Marlin	3151.4	4591.83	4530.11	4317.02	16,590.36
Dolphinfish	493.86	7,322.01	9,002.24	9,473.77	26,291.88
Wahoo	NR	361.66	854.67	1018.83	2235.16
Mackerel	NR	93.37	NR	20.1	113.47
Great Barracuda	NR	28.22	161.15	259.24	448.61
Shore	NR	5	577	NR	582
				Total	46,261.48

Blue Marlin

Blue marlin is the most targeted species on fishing tournament in Puerto Rico. Fishing activity on Blue Marlin can be divided as fish that are tag and or released, fish boarded and fish lost due to the fact that for tournament purpose they are reported. A total of 96 specimens have been measured for a total weigh of 16,590.36 kg and an average weight of 172.24 kg (Table 1). Fish size ranges between 2450 and 2667 mm, which is right at the legal size. A total of 1,050 individual have been tagged and released (i.e 1999 = 309 T/R, 2000= 216 T/R, 2001 = 257 T/R, 2002 = 268 T/R).

Erdman (1968) pointed out the months from May - September as the time where prespawning males were most frequent. He stated that there were two spawning peaks one mostly large marlin (81.81 kg males 227.72 kg females) in May - July and a second period in August and September (males less than

68.18 kg females). These spawning periods for Blue Marlin coincide with Blue Marlin tournaments.

Dolphinfish

In the case of dolphinfish, the second most targeted species, but the most boarded, 25 out of 124 tournaments were dolphinfish tournaments with a total of 2,565 anglers participating in these tournaments.

A total of 26,291.88 kilograms of dolphinfish were boarded during fishing tournaments (Table 1). Of these 23,331.82 kg were boarded in dolphinfish tournaments and 2,960.22 kg as bycatch in tournaments targeting other species. Regarding the sex composition of the fish boarded, females dominated as the most boarded sex.

Wahoo

Wahoo is the third main species targeted on fishing tournaments (Table 1). A total of 2,2,35 kg have been measured for the species (Table 1). The size ranges from 770 - 1390 mm, with a peak at 1291 - 1330 mm. wahoo is also boarded as bycatch on tournaments that target other species; this will be addressed on the bycatch session.

Mackerel and Sailfish

For other game fish such as mackerel (*Scombridae* spp.) and sailfish, one and two tournaments were visited respectively. For mackerel, the total weight was 113.47 kg for the specimens boarded. Sailfish tournaments are mainly tag and releases. (Table 1)

Bycatch

In all the tournaments we have collected data on species that are boarded but are not part of the species targeted on the tournament. These specimens are difficult to get data from due to the fact that they are filleted and/or gutted before weighing of the targeted species has finished. From the data collected, dolphinfish, great barracuda, wahoo, and tunas are the most boarded bycatch species (Figure 3).

Catch Per Unit Effort

The overall Catch per unit effort (CPUE) for recreational fishing tournaments has shows a decrease over the years (Table 2). This decrease could be indicative of an affected fish community due to overfishing.

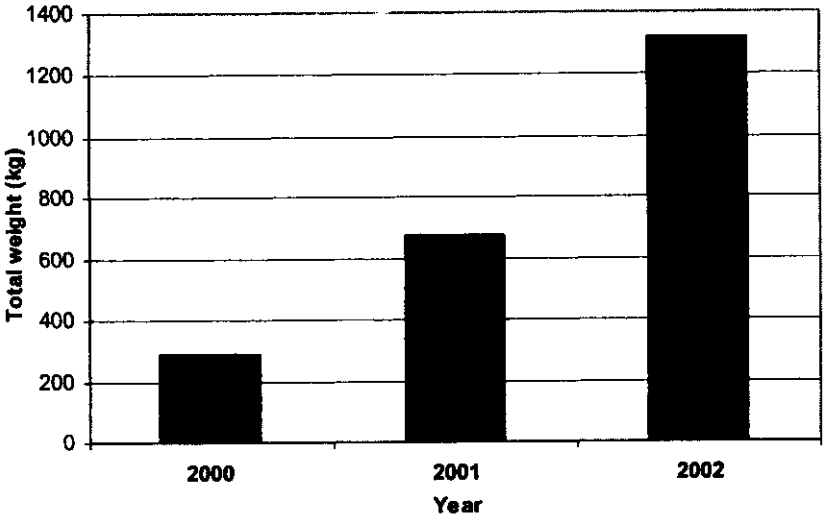

Figure 3. Total weight of bycatch landed in fishing tournaments

Table 2. Catch per unit effort (CPUE) by fishing tournament (2000-2002)

Year	Shore	Mackerel	Wahoo	Sailfish	Dolphinfish/ wahoo	Dolphin-fish	Blue Marlin	Average CPUE
2000	NT	0.3	NT	0.09	0.47	0.84	0.12	0.36
2001	0.98	NT	0.16	0.33	0.4	0.55	0.08	0.4
2002	0.1	0.09	0.06	0.003	0.64	0.35	0.06	0.18

DISCUSSION

Tournament activity in Puerto Rico is one of the less known fishing activities practiced in the Island. Anglers aging from 7 to 70 participated in fishing tournaments; this makes tournaments an essential part of family related activities. Data collected over the past three years has allowed us to recognize patterns related to recreational fisheries activities (type of tournaments held, size of landed fish, and targeted species among others).

Because dolphinfish size limit and bag limit has not been established in Puerto Rico, most tournaments have categories for highest total weight; it is frequently observed immature fish boarded because bringing as much fish as possible is encouraged. Anglers try, and most of the times succeed in catching all individuals in a school. In some instances, fish were weighted in groups from participating boats whenever this happened an average weight was determined.

When we compare results for blue marlin in 2000 to 2002 less fish were boarded. The number of individuals reported as tag and released increased this is mainly due to the encouragement tournament organizers to release all individuals.

As for bycatch, the data presented does not reflect what is actually caught. On most tournaments, only targeted species are weighed, and the two staffers have to weigh until the weighing period ends to gather this information. Most of the time fish are already gutted and filleted when the available personnel arrives in this case an estimate of the weight was also recorded.

Some "pool tournaments", where a group of fishermen pay a established quota and the gathered money is for the fisherman that bring the biggest fish, are held without permits and therefore not reported to DRNA personnel. Most of the time the information was available to our personnel the week after the activity was held. In some instances, organizers gave available information from these activities, most of the time only biggest fish caught and total number of boats. This kind of activity affects data gathering efforts because some data is lost.

The lack of information prior to this study prompted the investigation; although the fishing activity has been recorded, little is known about its impact on marine ecosystems, and the biology of targeted species. We recommend expanding the goals of the project to include an analysis of the biology of these species, the only information available regarding these is from 1983 - 1984 for blue marlin and research in 1992 on dolphinfish biology. Bycatch information needs to be recorded, so more effort should be address to gather data on bycatch species being affected by the fishing tournaments. Some of these species are also important commercially, and the fishing pressure on some age classes could be detrimental to the species.

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