THE ICCAT ENHANCED RESEARCH PROGRAM FOR BILLFISH IN JAMAICA: RECREATIONAL AND COMMERCIAL LANDINGS OF BLUE MARLIN, 1976 - 1992

Guy C. McN. Harvey[1], John E. Graves[2]

SUMMARY

This document provides a review of the recreational and commercial billfish fisheries of Jamaica, with an analysis of data collected at billfish tournaments over the past 17 years. In 1990 and 1991 the total recreational and artisinal commercial billfish catch averaged 31.5 metric tons, of which blue marlin accounted for about 90% of the catch. Between 1976 and 1992 the annual mean size of tournament caught blue marlin ranged from 49.0 kg to 62.7 kg with male fish comprising more than 80% of the catch. Over this same time period the tournament CPUE of blue marlin ranged from 0.07 fish /boat day to 0.43 fish /boat day, with two broad peaks of high catch /effort occurring in 1985-86 and 1989-91. To promote conservation of the billfish resource, sportfish tournaments instituted a minimum size for blue marlin of 45.5 kg in 1990. Since that time approximately 27% of blue marlin caught during billfish tournaments have been released.

RESUME

Le présent document fournit un exposé des pêcheries sportives et commerciales d'istiophoridés à la Jamaïque, ainsi qu'une analyses des données recueillies depuis 17 ans à l'occasion de championnats de pêche aux istiophoridés. En 1990 et 1991, la prise totale sportive et artisanale d'istiophoridés a été en moyenne de 31,5 TM, dont 90 % de makaire bleu. De 1976 à 1992, la taille moyenne annuelle des makaires bleus capturés lors des championnats allait de 49,0 kg à 62,7 kg les mâles constituant plus de 80 % de la prise. Pendant cette même période, la CPUE du makaire bleu pêché pendant les championnats a été de 0.07 poissons /bateau /jour à 0.43 poissons /bateau /jour, avec deux amples pics de capture /effort élevés en 1985-86 et 1989-91. Afin d'appuyer la conservation des ressources en istiophoridés, les championnats de pêche sportive ont instauré en 1990 une taille minimum de 45,5 kg pour le makaire bleu. Depuis lors, 27 % environ du makaire bleu capturé pendant les championnats de pêche aux istiophoridés ont été relâchés.

RESUMEN

Este documento presenta el panorama de las pesquerías comercial y de recreo de Jamaica, con un análisis de los datos recogidos en los torneos de marlines durante los últimos 17 años. En 1990 y 1991, la captura total de las pesquerías de recreo, artesanal y comercial, promedió 31.5 t, compuesta en un 90% de aguja azul. Entre 1976 y 1992, la talla media anual de la aguja azul pescada en torneos estaba entre 49.0 y 62.7 kg con una proporción de machos superior al 80%. En este mismo período, la CPUE de los torneos de aguja azul estaba entre 0.07 peces /barco por día y 0.43 peces /barco por día, con dos amplios máximos de elevada captura /esfuerzo en 1985-86 y 1989-91. Con el fin de promover la conservación de los recursos de marlin, en 1990, en los torneos de pesca deportiva se estableció una talla mínima para la aguja azul de 45.5 kg. Desde entonces, se ha liberado aproximadamente el 27% de las agujas azules pescadas en torneos de pesca de marlines.

[1] Guy Harvey Inc., 14 Manor Park Drive, Kingston, Jamaica

[2] Virginia Institute of Marine Science, College of William and Mary, Gloucester Point, VA 23062, U.S.A.

1. INTRODUCTION

The precision of billfish stock abundance estimates derived from catch per unit effort (CPUE) data is only as good as the time series upon which the estimates are based. The offshore longline fishery for tunas, of which billfish are a common bycatch, presents an extensive temporal series of catch and effort data. This CPUE time series has been used by ICCAT and other management agencies to estimate the status of billfish stocks, or billfish abundance. However, there are several problems associated with the use of longline fishery data base which could potentially affect the precision of abundance estimates.

Billfish are not the primary target of longline fisheries, although they do represent a significant bycatch of gear that is deployed to maximize the catch of tunas. It is uncertain how meaningful a CPUE index is when the fishery gear is not optimally directed for the species in question. Furthermore, over the past 20 years there have been significant changes in the longline fishery, including changes in areas and depths of gear deployment, as well as technological improvements. These changes make comparisons of fishing effort over long time periods difficult. Finally, there are concerns regarding the accuracy of catch and effort data reported by some countries which could potentially bias CPUE estimates. In light of these concerns, there appears to be a need to find other CPUE time series with which to compare existing data sets.

Billfish sportfishing tournaments represent good alternate sources for CPUE time series, although the data are spatially restricted. Several Atlantic billfish tournaments have been held annually for over 30 years (Prince et al. 1990). Typically these tournaments maintain excellent records of fishing effort and billfish catches. As the tournaments are usually held at the same time each year, there is little seasonal bias. Fishing areas and fishing gear do not change substantially on a year-to-year basis, facilitating comparisons of effort.

In Jamaica billfish tournaments have been held fairly regularly along the northern coast for many years, providing a good time series for CPUE analysis. In this paper we review the records maintained by major Jamaican billfish tournament from 1976 - 1992, and present analyses of the yearly average size of fish landed, CPUE, and the proportion of fish released. In addition, we present an overview of the ICCAT Enhanced Billfish Program in Jamaica and a general description of the island's recreational and commercial billfish fisheries.

2. BACKGROUND

A historical review of the recreational and artisinal fisheries of Jamaica was presented by Harvey (1989). Blue marlin (*Makaira nigricans*) typically account for more than 90% of the recreational and local commercial billfish catch. White marlin (*Tetrapturus albidus*), sailfish (*Istiophorus platypterus*), longbill spearfish (*Tetrapturus pfleugeri*), and swordfish (*Xiphias gladius*) comprise the remaining billfish catch. Blue marlin are found all around the island and near offshore banks (Figure 1). Blue marlin abundance is greatest along the northern coast where deep water (>200 m) is found within 0.5 km of shore. Although blue marlin are taken throughout the year, there is a peak in abundance during the fall months.

Billfish are taken in two commercial fisheries which operate in waters near Jamaica. A foreign longline fleet, composed primarily of American owned vessels, operates in waters outside of the 12 mile territorial limit. During the 1980's many of these vessels offloaded in Kingston, where dressed swordfish were flown to market in the United States. However, in recent years, most foreign vessels fishing in offshore waters offloaded in Haiti. Consequently, the magnitude of the catch and effort of the foreign longline fishery in Jamaican waters is not known.

Blue marlin are also taken in a small artisinal fishery which principally targets other pelagic species such as tuna, wahoo and dolphin (reviewed in Harvey, 1989). This fishery operates from small (less than 9 m) canoes powered by outboard motors in nearshore waters, sometimes extending to the offshore banks. Billfish are taken on trolled lures, and/or dead or live bait, and brought in on handlines. The directed effort of this fishery, as well as the total billfish catch, are difficult to determine because canoes are launched from several areas around the island, including many isolated beaches. However, it is known that the effort expended by the artisinal fishery varies with the price of gasoline, as well as the market

price of the fish. In recent years, gasoline prices have risen due to a reduction of government subsidies and the price of pelagic fishes has dropped due to an abundance of locally grown *Tilapia*.

The recreational fishery for billfish in Jamaica comprises a fleet of charter boats which fishes throughout the year, and the boats which participate in annual billfish tournaments. In recent years, the size of the charter fleet has ranged between 10 and 20 boats, depending on economic conditions (Harvey 1989). The majority of the charter boat effort occurs along the northern coast, near resorts of Ocho Rios and Montego Bay. With the inception of the ICCAT Enhanced Billfish Program in Jamaica, the majority of captains of charter boats have maintained records of catches, and have made their logbooks available for analysis. This information was used to calculate a recreational catch for the years of 1990 and 1991.

A major fraction of the recreational billfish fishing effort occurs in a series of 3 - 5 day billfish tournaments, held on the northern coast of Jamaica during the peak of blue marlin abundance in the early fall. Tournaments have been traditionally held at Montego Bay, Ocho Rios, Falmouth and Port Antonio, although not all tournaments have been held each year. Billfish are taken at other sportfishing tournaments around the island; however, as these tournaments target other pelagic species, billfish are typically caught incidentally.

The fall billfish tournaments of the northern coast of Jamaica have maintained good records of billfish catches and fishing effort for the past 17 years. These data are presented and reviewed below.

3. MATERIALS AND METHODS

The ICCAT Enhanced Billfish Program was initiated in Jamaica during 1989. At that time charter boat captains and artisinal fishermen were provided with ICCAT catch forms, tape measures and species identification photographs. Their records, as well as information obtained in interviews by the senior author, provide the basis for total catch estimates of 1989 and 1990.

The data from Jamaican billfish tournaments from 1976 - 1992 were obtained by reviewing tournament records or direct sampling. Fishing effort was recorded to the nearest half day. All landed fish were weighed to the nearest 0.25 kg (0.5 lb). Starting in 1988 standard ICCAT data was obtained, including sex, total length and lower jaw-fork length.

4. RESULTS AND DISCUSSION

The total Jamaican billfish catch for 1990 and 1991, estimated from records of artisinal fishermen, charter boat captains and tournament records, was 31,172 kg and 31,914 kg, respectively. In 1990 the catch comprised (by numbers) 91% blue marlin, 4% white marlin, 2% sailfish, and 3% swordfish. This figure probably is a slight underestimate of the actual catch because not all artisinal fishermen provided data and there were undoubtedly unreported incidental catches of billfish.

The average size of blue marlin landed at major Jamaican billfish tournaments is presented in Figure 2. Mean round weights typically varied from 50 to 60 kg. Mean sizes larger than 60 kg were recorded in 1976, 1982-83, 1987 and 1991-92, and fish smaller than 50 kg were recorded in 1979, 1985, and 1988-9. Male blue marlin were predominant in the catches. For example, in 1992 the sex ratio of tournament caught blue marlin was 6.1 Males: 1 Female.

The majority of males (79%) are in a ripe or running ripe condition throughout the year (Harvey 1989). Female blue marlin landed during the fall tournaments are typically running ripe or spent (Harvey 1989). The high proportion of males, and the frequency of running ripe females suggests spawning activity near Jamaica in the fall.

The total catch per unit effort of all major Jamaican billfish tournaments from 1976 - 1992 is presented in Figure 3. The CPUE values for 1976-1983 were based on only one or two tournaments, with as many as five tournaments contributing in the remaining years.

The CPUE data in Figure 3 indicate periods of relatively high catch per effort in 1985-6 and 1989-91. Catch rates were well below the mean in 1976-1981, and in 1988. The extent to which these data reflect trends in abundance in the general region is not known. Poor weather conditions during a tournament could clearly adversely affect CPUE values. This would be a significant bias during those years in which only one or two tournaments contributed to the annual mean CPUE. However, during years with multiple tournaments there was fairly good agreement of CPUE values, indicating a phenomenon that was much larger than the three to five days of the fishing tournament. For example, in 1977 there was a low annual CPUE of 0.12 blue marlin/boat day. This value was calculated from tournaments at Montego Bay and Port Antonio which had CPUEs of 0.14 and 0.11 blue marlin/boat day, respectively. Thus the fall of 1977 was characterized by a low CPUE for blue marlin. Similarly, in 1986, which was a good fishing year, the CPUE of 0.38 blue marlin/fishing day was based on four tournaments with consistently high individual CPUEs ranging from 0.31 to 0.42.

A major effort to release sport caught marlin did not begin in Jamaica until 1990. Due to the economic value of billfish, the majority of releases has occurred during tournaments. Only two fish were released by charter operations in 1990. Major Jamaican billfish tournaments employed a minimum size of 45.5 kg (100 lb) for billfish capture, a mass which corresponds to a 72 inch lower jaw-fork length. The proportion of billfish released in tournaments increased from 22.2% (35 total) in 1990 to 35.7% (46 total) 1991, but dropped to 20.9% (14 total) in 1992. The decrease in the number of fish released from 1991 to 1992 can be attributed to a higher abundance of fish larger than 100 pounds in 1992, an increase which is clearly evident in the mean weight of landed fish (Figure 2).

5. LITERATURE CITED

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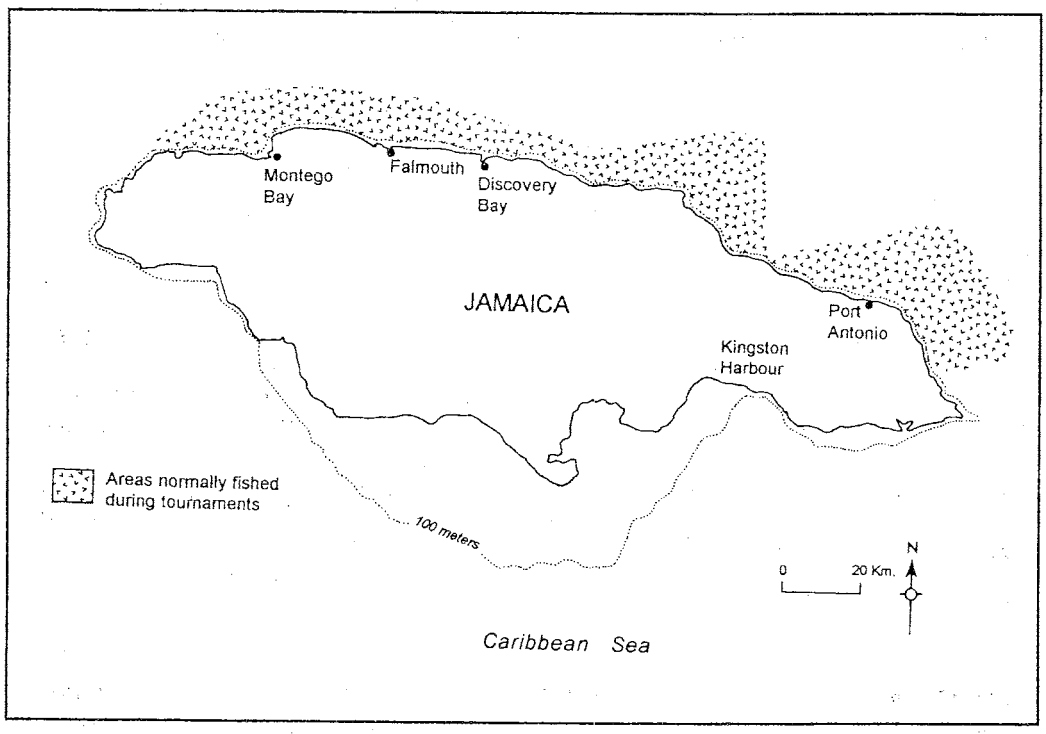

Figure 1. Map of the principal recreational billfish fishing areas around Jamaica.

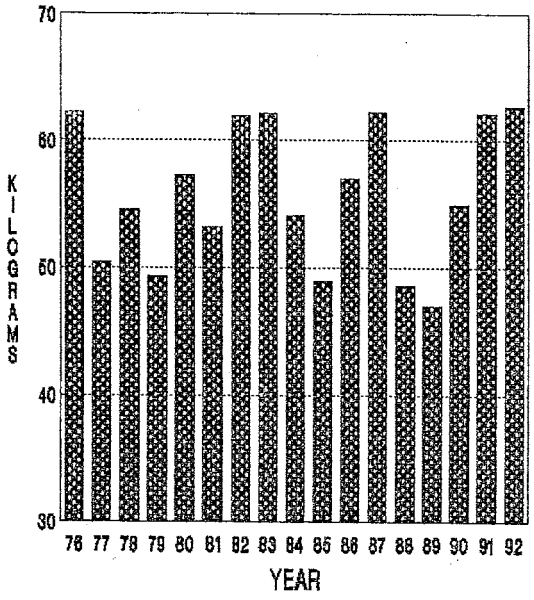

Figure 2. Mean round weight (kg) of blue marlin landed in Jamaican billfish tournaments, 1976-1992.

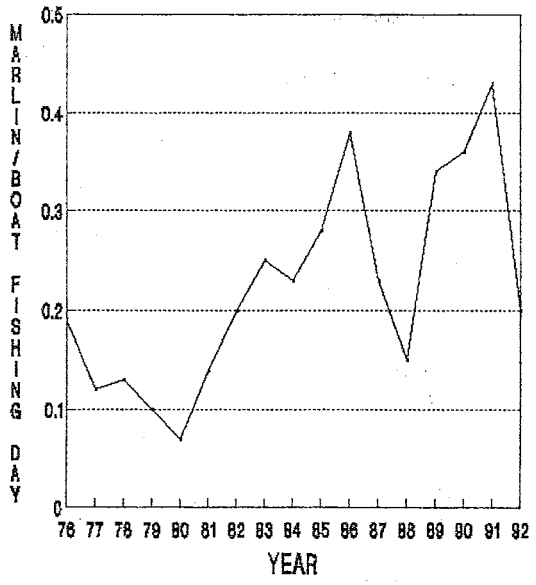

Figure 3. Mean catch-per-unit-effort (blue marlin/boat day) of Jamaican billfish tournaments, 1976-1992.