

Bermuda's Marlin Fishery - Catches of Blue Marlin (*Makaira nigricans*) and White Marlin (*Tetrapterus albidus*) with an Analysis of Recent Trends in Release Rate and Tournament Catch Per Unit Effort

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ABSTRACT

The catches of blue marlin by the Bermuda fishery (commercial and recreational) are presented for the past nine years (1990-98). Annual blue marlin catches have ranged from 100 to 231 fish over this period with release rates exceeding 80% in seven of the nine years. The Annual Bermuda Billfish Tournament, held at the height of the marlin fishing season (Late July - early August) has become predominantly a release tournament since a point system was established favouring the release of specimens. In the past seven years of the tournament (1992 - 1998), only 10 blue marlin have been boated while 128 were released. Approximately 50% of the released blue marlin were tagged. White marlin are taken generally in small numbers in this tournament and are virtually all released. The catch per unit of effort for blue marlin in the tournament has shown relatively small variations (nominal CPUE = 0.2 - 0.5) with no clear trend.

KEY WORDS: Catch per Unit Effort, marlin, release rates

INTRODUCTION

The Bermuda Division of Fisheries statistical database provides catch and effort data from the commercial fishery. All licensed fishers are required to submit catch and effort statistics in a self-reporting program. Several commercial charter fishing vessels specialize in blue marlin fishing during the season while the remaining commercial vessels direct their effort at species such as wahoo, yellowfin and blackfin tuna, amberjack and almaco jack. Recreational fishers are not required to obtain a vessel licence nor to submit statistics. As Bermuda has a large and active recreational fishing fleet, it is desirable to obtain information and statistics on fishing activities of recreational vessels in order to obtain a more complete overview of fishing catch and effort. There has been a sustained interest in billfishing on the island for many years and this has been enhanced in the 1990's by the landing of a number of blue marlin over 1,000 lbs. (454 kg) (see Luckhurst 1998 for details). The development of a comprehensive database on marlin catches and releases has been largely

accomplished through the cooperation of fishers who maintain personal records of marlin catches by all fishers (commercial and recreational) during the season and provide this information to the author. Detailed records from the annual Billfish Tournament are available from 1988 onward and this has provided the opportunity to develop a time series to examine nominal catch per unit of effort (Luckhurst 1994, 1998).

METHODS

The annual catch figures for blue and white marlin from the commercial fishery database (Division of Fisheries 1997) are difficult to validate because of the high release rate of these species and inconsistent reporting. Daily records maintained by interested fishers provide the most accurate data available. Recreational marlin catches are thus captured in this database and much of the information is validated by personal interview. Recent estimates indicate that recreational fishing vessels catch approximately 10-15 % of the blue and white marlin taken during the billfish season (May to October).

The data from the Annual Billfish Tournament has been provided by the organizers who obtain accurate information by interviewing the captains of all participating vessels. Statistical reporting forms are also provided for each vessel. This marlin tournament which is held at the same time every year (late July – early August) provides the best opportunity to capture accurate data on catch and directed effort.

RESULTS AND DISCUSSION

Marlin Catches

The reported catches of blue marlin by the Bermuda fishery since 1990 are presented in Table 1. Catches have varied over this period from a high of 231 fish in 1991 to a low of 100 fish in 1997. Comparable data for white marlin for this period are incomplete primarily because the fishery targets blue marlin and white marlin are often considered as by-catch and therefore are not as accurately recorded. The interannual variation in the catch of blue marlin is most probably related to differences in oceanographic conditions around Bermuda between years which may influence migration routes and hence annual abundance in local waters. There is little evidence of a significant change in the fishing effort for marlin by the Bermuda fishing fleet over this period although the absence of two of the top marlin fishing vessels in the past few years probably contributed to reduced catches. The catches of white marlin also oscillate over time probably in response to these same oceanographic factors.

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Table 1. Number of blue marlin caught and released by the Bermuda fishery (commercial and recreational) from 1990-98.

Year	No. Caught	No. Released	% Released
1990	142	92	64.8
1991	231	187	81.0
1992	229	201	87.7
1993	107	82	76.6
1994	141	115	81.6
1995	112	91	81.3
1996	203	191	94.1
1997	100	92	92.0
1998	148*	127	85.8

* No. of specimens caught up to November 1, 1998.

Release Rates and Tagging

The Sea Horse Anglers Club of Bermuda started to actively promote the tag and release of marlin in 1985. In that year, 41% of the marlin caught were released. The release rate remained in the 40-50% range until 1990 when it reached 65% (Luckhurst 1994). In the following year, the release rate increased to 81% and has remained above 80% every year except in 1993 (Table 1).

Most of the commercial charter fishing vessels carry tagging equipment on board and it is estimated that 70- 80% of these vessels will tag a marlin specimen before it is released. Many recreational fishing vessels are also equipped to tag specimens and sport fishing clubs generally promote tagging and release of billfish by their members. Most of the vessels in the local fleet use the tags provided by the National Marine Fisheries Service (Cooperative Gamefish Tagging Program) but in recent years The Billfish Foundation (TBF) tags have become popular for marlin, particularly with the charter fishing vessels. These TBF tags are now widely used for billfish whereas the NMFS tags are used principally for tunas. Even with the assistance of cooperating fishers, it is still difficult to obtain an accurate assessment of the proportion of specimens tagged on an industry wide basis in any given year.

Annual Billfish Tournament - Directed Fishing Effort

The Annual Billfish Tournament organized by the Sea Horse Anglers Club provides the most accurate data on catch and directed effort for marlin in Bermuda (Luckhurst 1994, 1998). The measure of effort is vessel fishing days where a day is defined as eight daylight hours. Data were obtained on the fishing effort of each vessel by interviewing the captains to determine how many hours were spent trolling for marlin during each day of the four day tournament. The organizers of the tournament undertake this task at the completion of each

year's tournament to obtain the most accurate data possible . A measure of nominal catch per unit effort (number of marlin caught per vessel fishing day) is thus derived. The results from the last nine years indicate little variation from year to year with values for blue marlin ranging from 0.20 to 0.49 (Figure 1). Due to the relatively small number of vessels which participate in the tournament (20-25), it should be noted that the catch per unit effort (CPUE) can be influenced by the presence or absence of vessels and captains who have a proven record of catching marlin. One of the most productive marlin fishing vessels in the fleet has been absent from this tournament for the past three years and this may have depressed the CPUE values in 1996 - 1998. This is, however, only a qualitative observation. This CPUE data set can be combined with those derived from other fisheries in the Atlantic to generate an index of abundance of blue marlin which can be used in stock assessment.

The release rate of blue and white marlin in the Annual Billfish Tournament has been maintained at a high level since 1992 (Table 2). This trend has been strongly influenced by the tournament rules which promote the release of blue marlin by setting a minimum weight of 500 lbs (226.7 kg) for weigh-in. The release of any smaller-sized blue marlin will give the angler the same point value (500 points) as boating a minimum size fish. Any boated fish under 500 lbs is not eligible to be entered in the tournament. In the past seven years of the tournament (1992 - 1998), only 10 blue marlin have been boated while 128 were released (Table 2). Approximately 50% of the released blue marlin were tagged. In two of the years where catches were amongst the highest recorded (1992, 1996), all of the blue marlin caught were released. In 1997, only one fish was boated because it died on the line while being fought by the angler. The growing strength of the conservation movement for billfish is such that most charter captains are reluctant to boat a fish unless it is an exceptional trophy specimen.

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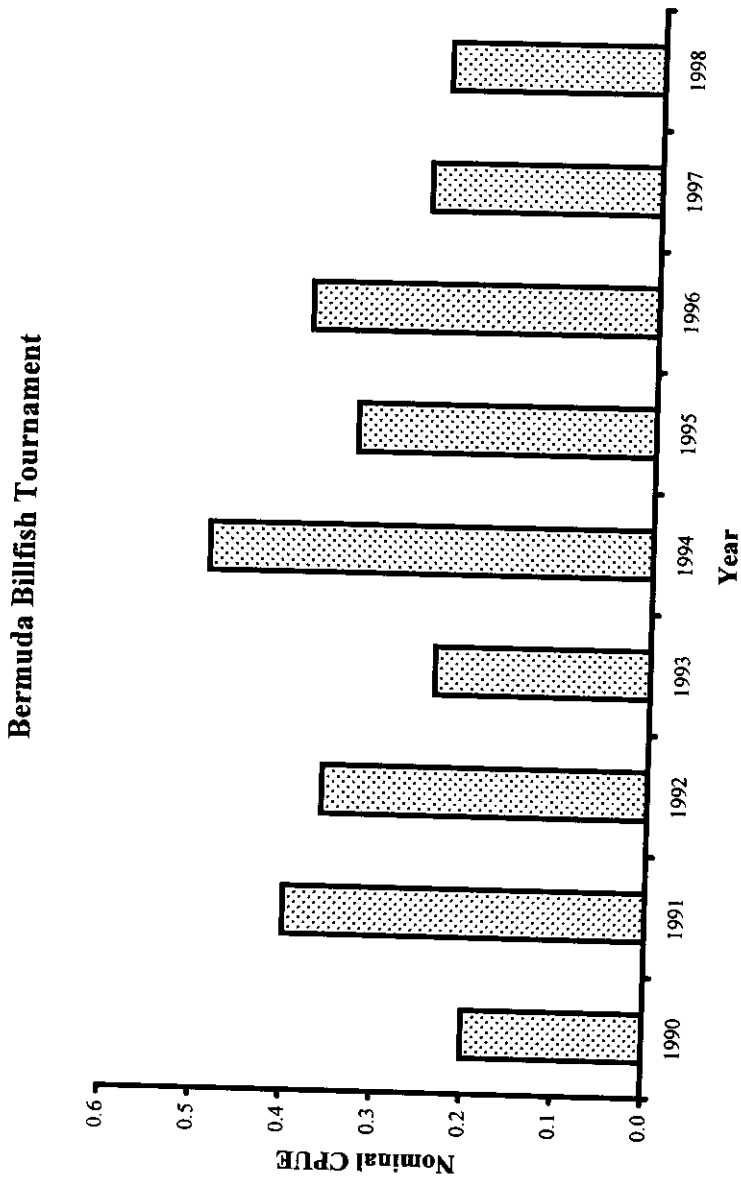


Figure 1. Nominal catch per unit effort (blue marlin caught per fishing vessel day) at the annual Bermuda Billfish Tournament.

Table 2. Number of blue marlin and white marlin caught, released and tagged during the four day Annual Bermuda Billfish Tournament since 1992. The 1998 tournament was run for two days only. Only one white marlin was boated.

Year	No. Caught		No. Released (tagged)		% Blue Released
	Blue	White	Blue	White	
1992	24	1	24 (11)	1 (1)	100
1993	18	10	15 (8)	9 (4)	80.3
1994	21	0	20 (12)	0	95.2
1995	24	3	22 (12)	3 (1)	91.7
1996	28	0	28 (14)	0	100
1997	15	5	14 (3)	5 (2)	93.3
1998	8	7	6 (2)	7 (4)	75.0

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