

RECREATIONAL CPUE FOR ATLANTIC BLUE MARLIN ALONG THE U.S. EAST COAST, BAHAMAS, CARIBBEAN SEA AND GULF OF MEXICO, 1972-1984

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SUMMARY

A survey of recreational catch and effort of anglers trolling for billfishes at selected docks and tournaments along the U.S. east coast, in the Bahamas, Caribbean, and Gulf of Mexico was summarized for blue marlin for the period 1972-1984. The 13-year average CPUE for blue marlin from the Caribbean was significantly higher compared to the other three areas in this geographical region. Average annual CPUE for blue marlin from the U.S. east coast showed a steady decline after 1979, while the trends for other areas (including all areas combined) generally increased. The average percent success of catching a blue marlin (i.e., those landed or released after being hooked) ranged from 44 to 48 percent during the survey.

RESUME

Une prospection sur la prise et l'effort de la pêche sportive visant les poissons porte-épée dans certains ports d'attache et championnats le long de la côte est des Etats-Unis, aux Bahamas, aux Antilles et dans le golfe du Mexique est récapitulée en ce qui concerne le makaira bleu pour les années 1972-84. La moyenne sur 13 ans de la CPUE du makaira bleu est sensiblement plus forte aux Antilles que dans les trois autres secteurs de cette zone géographique. La CPUE moyenne annuelle du makaira bleu de la côte est des Etats-Unis a montré une baisse régulière après 1979, alors que la tendance des autres secteurs (y compris celle de tous les secteurs combinés) a en général augmenté. Pendant la prospection, le pourcentage de possibilité de capturer un makaira bleu (c'est-à-dire débarqué ou relâché après avoir mordu à l'hameçon) était de 44 à 48 %.

RESUMEN

Se presenta el resumen de una prospección de la captura y esfuerzo de la pesca deportiva con caña de la aguja azul, realizada en muelles y torneos seleccionados, a lo largo de la costa Este de Estados Unidos, en las Bahamas, Mar Caribe y Golfo de México, correspondiente al período 1972-1984. La CPUE media de 13 años de la aguja azul del Caribe era muy alta en comparación con las de otras tres zonas de esta región geográfica. La CPUE media de la aguja azul en la costa Este de Estados Unidos mostraba un descenso gradual y constante a partir de 1979, mientras que las tendencias en otras zonas (incluyendo todas las zonas combinadas) tendía en general hacia el aumento. En la prospección, el porcentaje medio de éxitos en la captura de la aguja azul (es decir, peces embarcados o soltados tras morder el anzuelo) estaba entre 44 y 48 por ciento.

INTRODUCTION

A survey of recreational catch and effort for billfishes along the U.S. east coast, in the Bahamas, Florida east coast and Keys, Caribbean, and Gulf of Mexico (Fig. 1) was organized at the Southeast Fisheries Center's Miami Laboratory in 1972. This survey covered only recreational anglers trolling for billfishes (istiophorids only) at selected docks and tournaments in this geographical region. Beardsley and Conser (1981) describe the survey and present an analysis of these catch and effort data for the period 1971-1978. This report has been prepared to describe the recreational fishery for blue marlin (*Makaira nigricans*) during the 13-year period, 1972-1984, by: (1) Determining the effect of geographical area on the 13-year mean catch-per-unit-effort (CPUE) for blue marlin; (2) Determining the temporal trend of mean annual CPUE by area for blue marlin; and (3) Determining the average percent success of catching a blue marlin by area (i.e. those landed or released after being hooked). The Florida east coast and Keys (Fig. 1) were not included in these analyses because the traditional fishery in this area for billfish does not generally target blue marlin and relatively few are caught.

METHODS

The data acquired at docks and tournaments included the following: fishing effort (hours spent trolling); species and number of billfish boated, hooked, released, tagged, or lost; length, weight, and sex of billfish landed; and weather conditions (sea state, cloud cover, wind speed and direction). Efforts were made to sample docks and tournaments in the same location at about the same time each year (Fig. 1). However, many new tournaments have been initiated and some have terminated since the initiation of the survey in 1972. Therefore, not all tournaments have been sampled for each year of the survey. A more detailed explanation of the survey and some of its limitations can be obtained by referring to Beardsley and Conser (1981).

Statistical Procedures

We attempted to test the following null hypotheses: (1) Mean CPUE (13-year average) for blue marlin were the same from each area; and (2) There were no upward or downward trends in mean annual CPUE for blue marlin by area for the 13 years of the survey. Because variances between areas were heterogeneous, the non-parametric Kruskal-Wallis rank sum test was used to test hypothesis number 1. If significant differences were detected, the Dunn's test for multiple comparisons was used to determine which treatments were different for each other (Conover 1971). Mean annual CPUE was calculated by partitioning the data by month and area and then calculating mean values for each year ($\frac{\sum C}{T \cdot E}$ for each month and area). These data were plotted with 95% confidence intervals and Spearman Rho Rank Correlation (SRRC) was used to test for mutual independence between variables (i.e. upward or downward trends).

RESULTS

The average CPUE for blue marlin was more than 3 times higher in the Caribbean compared to the U.S. east coast, Bahamas, and Gulf of Mexico (Fig. 2). Multiple comparisons using Dunn's test based on Kruskal-Wallis rank sums indicate that Caribbean blue marlin CPUE were significantly higher ($P < 0.05$) compared to other areas. Blue marlin CPUE from the U.S. east coast, Bahamas, and Gulf of Mexico were not statistically different ($P < 0.05$).

Blue marlin mean annual CPUE (Fig. 3) from the U.S. east coast was the only area of those examined that showed a decreasing trend (SRRC = -0.60, $P < 0.03$). This trend fluctuated somewhat during the early years of the survey, but did indicate a steady decline after 1979. The trend in CPUE for blue marlin from the other areas indicated slight to moderate increases; with the range in SRRC = 0.36 to 0.76 (Fig. 3).

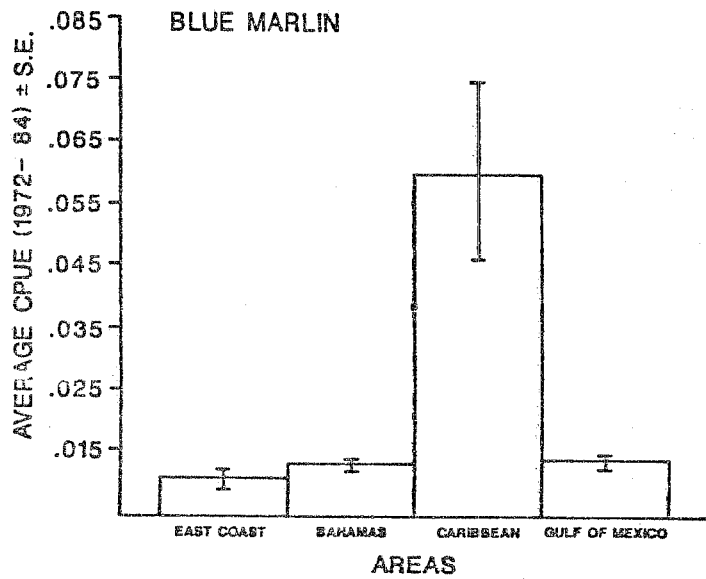


Figure 2. Average 13-year CPUE (1972-1984) for blue marlin from the U.S. east coast, Bahamas, Caribbean, and Gulf of Mexico. Vertical lines are \pm one standard error.

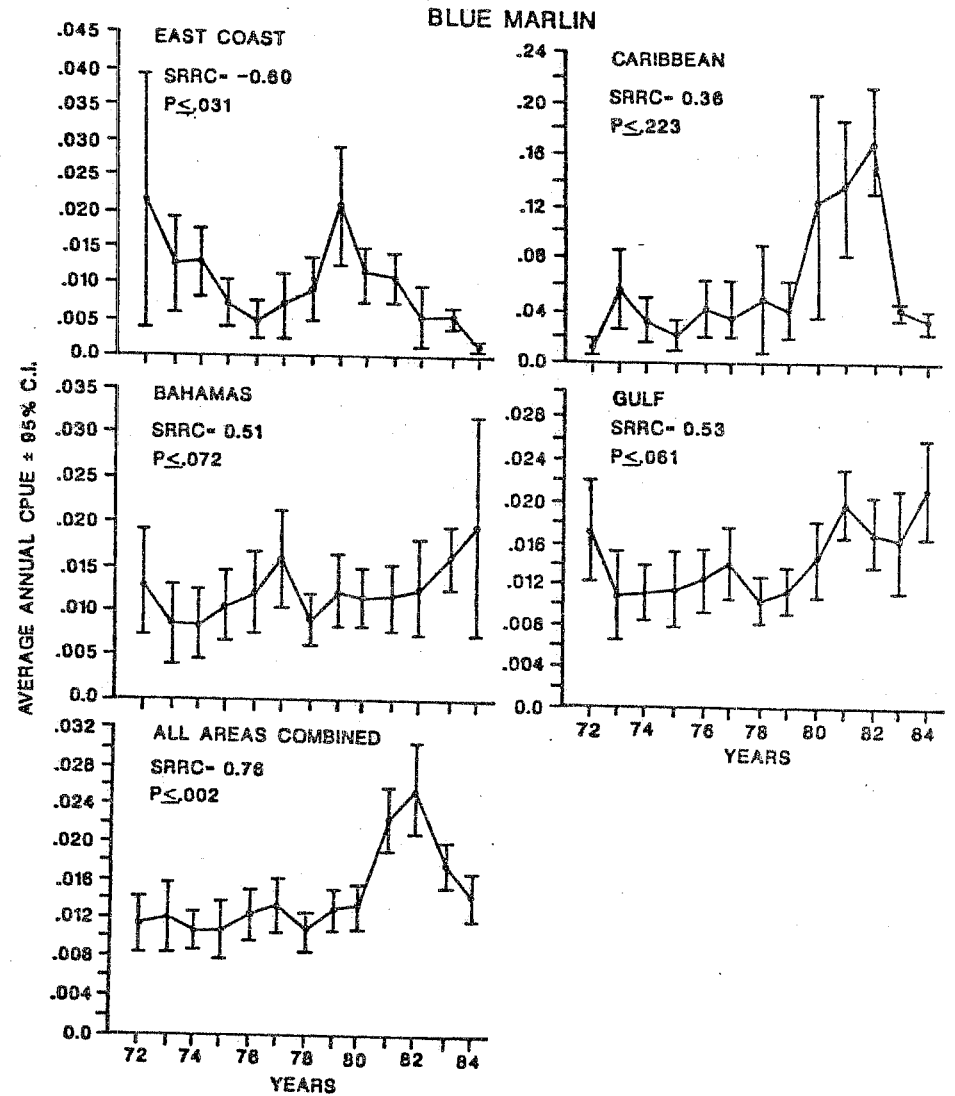


Fig. 3. Average annual CPUE for blue marlin from the U.S. east coast, Caribbean, Bahamas, Gulf of Mexico, and all areas combined. Vertical lines are \pm 95% confidence intervals. Spearman Rho Rank Correlation (SRRC) and probabilities are also given for each category.

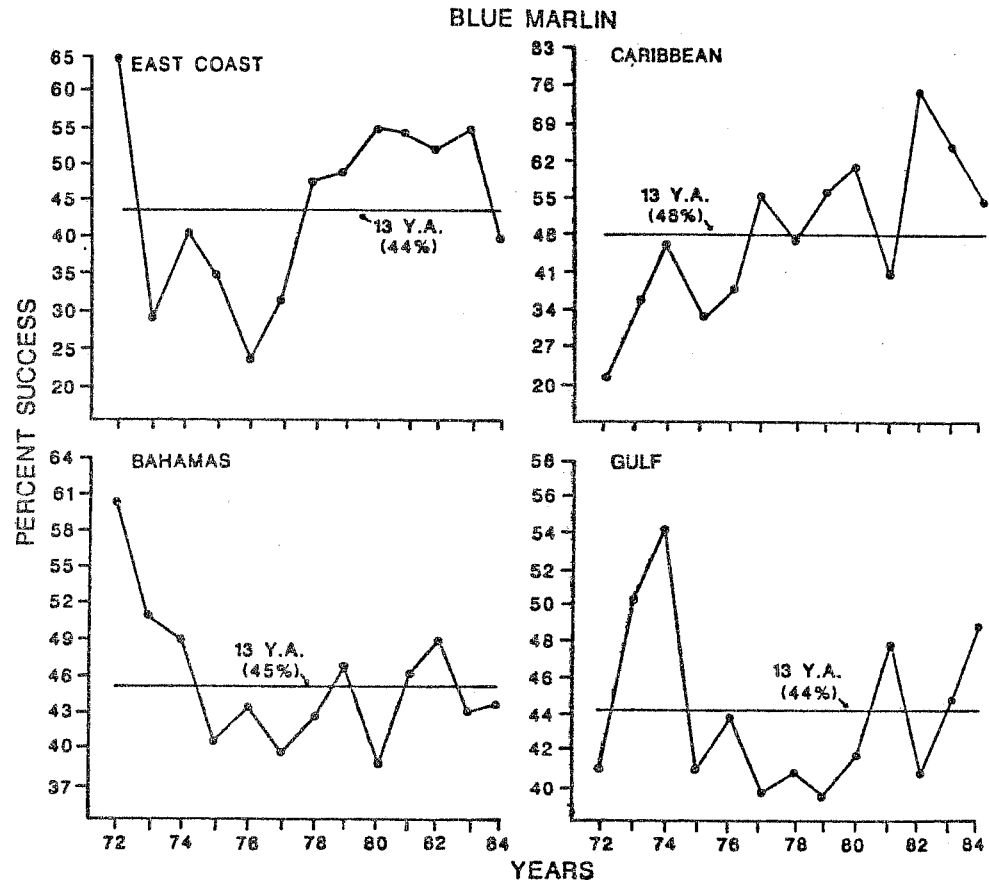


Figure 4 The percent success of catching a blue marlin (i.e. landing or releasing) after being hooked for the U.S. east coast, Caribbean, Bahamas, and Gulf of Mexico. Horizontal line gives 13-year average for each category.