

## PROGRESS OF THE ICCAT ENHANCED RESEARCH PROGRAM FOR BILLFISH IN THE WEST ATLANTIC DURING 1989

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## SUMMARY

Progress of the ICCAT Enhanced Research Program in the Western Atlantic Ocean for 1989 are summarized by program objective and location. Research activities in the western Atlantic for 1989 were conducted in Grenada, Barbados, Jamaica, Dominican Republic, Venezuela, St. Maarten, N.A., and in the United States. Shore-based sampling of recreational, artisanal, and industrial fisheries was accomplished in most locations while at-sea sampling of five trips aboard industrial longline vessels was done out of Cumaná, Venezuela. Important progress was made in developing field species identification kits and a new laboratory technique for determining sex of eviscerated billfish carcasses. All the materials were assembled for the billfish tagging program and several important samples were attained for age and growth studies.

## RESUME

Les progrès réalisés en 1989 dans le cadre du Programme de Recherche intensive sur les Istiophoridés sont récapitulés par objectif et par zone. Les activités de recherche dans l'Atlantique ouest en 1989 ont été menées à Grenade, aux Barbades, à la Jamaïque, dans la République Dominicaine, au Vénézuéla, à St-Maarten (Antilles Néerlandaises) et aux Etats-Unis. L'échantillonnage à terre des pêcheries sportive, artisanale et industrielle a été mené dans la plupart des endroits; l'échantillonnage en mer à bord de palangriers industriels a été mené lors de cinq sorties à partir de Cumana (Vénézuéla). De grands progrès ont été réalisés en ce qui concerne l'élaboration de trousse de matériel d'identification des espèces, ainsi que d'une nouvelle technique de laboratoire pour la détermination du sexe des carcasses d'istiophoridés éviscérés. Tout le matériel nécessaire au programme d'échantillonnage d'istiophoridés a été rassemblé, et plusieurs échantillons importants ont été obtenus en vue d'études sur l'âge et la croissance.

## RESUMEN

Los progresos del Programa ICCAT de Investigación Intensiva sobre Marlines en el Atlántico Oeste para 1989 se resumen por objetivos del programa y por emplazamiento. Las actividades de investigación en el Atlántico Oeste en 1989 se llevaron a cabo en las islas de Granada, Barbados, Jamaica, y en la República Dominicana, Venezuela, St. Maarten (Antillas Holandesas), y Estados Unidos. Se efectuó muestreo en la orilla de las pesquerías deportiva, artesanal e industrial en la mayor parte de los emplazamientos, mientras que se llevó a cabo muestreo en la mar de cinco viajes de barcos palangreros industriales frente a Cumaná, Venezuela. Se alcanzaron importantes progresos en el desarrollo de equipos de campo para la identificación de especies y de una nueva técnica de laboratorio para determinar el sexo de las carcasas evisceradas de marlin. Se ensamblaron todos los materiales para el programa de marcado de marlines, y se consiguieron muestras importantes para estudios de edad y crecimiento.

## INTRODUCTION

Research activities during 1989 began on a limited scale shortly after the 1988 SCRS meeting, although significant progress was not made until after the first of the year. The objectives presented in the initial program plan in 1986 (Appendix 6 to Annex 12 of Report for Biennial Period, 1986-87 Part 1) have not changed, and include: (1) Provide more detailed catch and effort statistics; (2) Expand the ICCAT billfish tagging program; and (3) Assist in collecting data for age and growth studies.

The two locations for intensive scientific study given in the original plan remain the Caribbean Sea and the west coast of Africa. The overall program coordinator during 1989 was Dr. Bradford Brown (U.S.A.); Dr. Eric Prince (U.S.A.) was the coordinator for the western Atlantic Ocean and Mr. Taib Diouf (Senegal) coordinated activities in the eastern Atlantic Ocean. The following are the coordinating activities realized by the West Atlantic Coordinator for this Program.

### OBJECTIVE 1 -- LANDING STATISTICS

#### Coordination Travel in the Caribbean Sea

Dr. Eric Prince made several trips to Caribbean locations in 1989 as part of his coordinating responsibilities for program activities in the western Atlantic Ocean. The four trips made in 1989 (March, April, June, October) were to Caribbean locations that had participated in the billfish program the previous year and included stops in Grenada, Barbados, Jamaica, Caracas and Cumaná, Venezuela, and Santo Domingo, Dominican Republic. Travel in the early part of the year (March and April) was for the purpose of finalizing 1989 research plans in each location, collecting data, and investigating possible expansion of program activities in some locations to include at-sea sampling. Travel to the Dominican Republic in June was for the purpose of training research personnel, sampling a billfish tournament for biological samples, and assisting in the shipment of a freezer to D.R. personnel, through the U.S. embassy in Santo Domingo. Travel to Jamaica in October was made to sample a billfish tournament for biological samples, assist in age and growth studies, give a slide presentation on ICCAT program activities, and receive a financial donation for the ICCAT billfish program from various conservation groups.

The following summarizes research progress according to location and/or type of research activity.

Grenada. The ministry of Education, Culture, and Co-operatives and Fisheries continued shore-based sampling activities of the artisanal fishery during the 1988-89 season. Size frequency data collected in 1988-89 primarily included sailfish, although several blue marlin were also sampled. Since numerous local and foreign-flagged longline vessels used Grenada as a port of convenience in 1989, an effort was made to put an observer on one of the larger boats. This was not successful because most of the larger boats had switched fishing grounds prior to availability of funds.

Barbados. Dr. Hazel Oxenford of Bellairs Research Institute has summarized historical billfish landing statistics from the artisanal fishery, dating back to 1957 in SCRS working document SCRS/89/31. The initial approach for separating billfish landings by species are described, along with future plans for refining these statistics. Shore-based sampling in Barbados continued in 1989 on a limited scale because a full-time technician could not be hired--Dr. Oxenford took measurement on about equal numbers of sailfish, white marlin, and blue marlin in 1989. A few larger longline vessels are now operating out of Barbados, which raises the possibility of having ICCAT observers aboard if a technician with experience can be found. It may be necessary for the ICCAT billfish trust fund to provide liability insurance for observers in this location, since samplers in Barbados are not government employees who have insurance coverage through their jobs. Funding requirements for 1990 will be re-evaluated at the 1989 SCRS meeting.

Jamaica. Dr. Guy Harvey of the University of West Indies has summarized 1989 research activities and will present a paper to the SCRS. A total of four recreational billfish tournaments in Jamaica were covered in 1989, in addition to artisanal marlin fishing in Jamaican coastal waters. Dr. Harvey also submitted shore-based landings statistics on several tournaments held outside Jamaica, including the Hemingway tournament in Havana, Cuba, and the million dollar month tournament in the Cayman Islands, British West Indies. The Ocho Rios Tournament in Kingston, Jamaica, is planning to make a donation to the ICCAT Billfish Program in 1989. Size frequency measurements were obtained primarily from blue marlin during 1989. Funding requirements for 1990 will be re-evaluated at the 1989 SCRS meeting.

Dominican Republic. Mr. Mario Delgado of the Dominican Foundation to Preserve and Research the Marine Resources (MAMMA) submitted shore-based landings statistics from five recreational billfish tournaments in 1989. Shore-based sampling of billfish tournaments resulted in size frequency measurements from mostly white and blue marlin in 1989. In addition, muscle tissue samples from 34 white marlin were obtained for development of the species identification kits. A small chest freezer was purchased in Miami and shipped to Santo Domingo for the purpose of storing biological samples. The freezer will be housed at the MAMMA office where auxiliary electrical supply is available. This situation will prevent spoilage of biological samples (skeletal structures for age and growth) prior to shipment to Miami. Funding requirements for 1990 will be re-evaluated at the 1989 SCRS meeting.

Venezuela. At-sea and shore-based sampling activities continued at the port of Cumaná, Venezuela, where at least 19 industrial longline vessels target yellowfin tuna but also catch billfish. In addition, shore-based sampling of the recreational fishery was initiated in 1989. At-sea sampling accomplished a total of five trips as of October, 1989. Two additional trips have been scheduled for the remainder of the year. Computerization of these data, as well as all ICCAT billfish landings statistics collected so far in the program, are scheduled for the winter and spring of 1989/1990. Observer data were used to help compute additional length regressions (total length vs. lower jaw fork length) for Istiophoridae (Lee and Prince, SCRS/89/70) as well as calculate dead discards for total landings reports for the U.S. longline fishery in the Caribbean Sea.

Shore-based sampling in Cumaná harbor was also accomplished in 1989, with a total of several hundred (each) blue marlin, white marlin, and sailfish being measured during the 1989 sampling season. During late spring, many of the longline boats were off-loading their catches at other Caribbean ports due to economic considerations and this resulted in less shore-based sampling during this period.

Shore-based sampling of recreational billfish tournaments, mostly from the La Guaira area, was accomplished for six tournaments in 1989. These data are summarized by Alio and Gaertner and will be presented to the SCRS. Funding requirements for Venezuela for 1990 will be re-evaluated at the 1989 SCRS meeting.

St. Maarten, Netherlands Antilles. Shore-based sampling at the Curaçao Pioneering Company in St. Maarten, Netherlands Antilles, continued in 1989. Sampling at this location is from the large Asian longline fleets where billfish carcasses are off-loaded without heads, fins, and viscera. Sampling requirements were simplified for the 1989 season (only one measure of length was required) in hopes of obtaining a larger volume of data. As of this date, two vessels have been sampled resulting in measurements from 100 white marlin, and sailfish. The ICCAT Secretariat will have to intercede to try to increase our sampling in this location since efforts to obtain measurements have been sporadic. Funding requirements for 1990 will be re-evaluated at the 1989 SCRS meeting.

#### Species Identification Kits

Drs. James Hartmann and Raymond E. Waldner from Florida Atlantic University summarize research on the development of field species identification kits during 1989 in SCRS/89/69. Additional sampling requirements, as identified in last year's report (SCRS/88/37) were successfully obtained in 1989. These included muscle tissue samples from sexed sailfish and white marlin. Because of the importance of this research, the general coordinator (Dr. Bradford Brown) approved an additional \$2,000 expenditure when additional laboratory materials were needed at the beginning of the year. Research on this project is on schedule and the first laboratory test for Atlantic sailfish will occur in December, 1989. Once this first laboratory test is successfully carried out, the other two species will be tested in the laboratory prior to actual development of the kit and field testing later in 1990.

An opportunity for conducting research to develop a test to determine the sex of dressed billfish carcasses occurred in April, 1989, when Dr. Ray Simon, a geneticist for the U.S. Fish and Wildlife Service, Kearneysville, West Virginia, volunteered to pursue this subject if provided the appropriate samples. The U.S. Fish and Wildlife Service funded the major portion of this project, while the U.S. National Marine Fisheries Service will absorb some of the costs of laboratory chemicals and equipment. However, the research will be conducted at no cost to ICCAT. The western Atlantic

coordinator (Dr. Eric Prince) obtained muscle tissue, kidney and gonad samples from ten Atlantic sailfish from the Pampano Beach Fishing Rodeo in May, 1989, and the results of this work are summarized by Dr. Simon in SCRS/89/71. This work could make an important contribution because sexually dimorphic growth has been demonstrated for Istiophoridae, and therefore the sex ratios of the landings need to be determined. This has been difficult or impossible because most of the billfish landings are dressed at sea (eviscerated) prior to off-loading. If successful, this research could be applied to other species as well.

#### OBJECTIVE 2 -- BILLFISH TAGGING PROGRAM

The West Atlantic Coordinator worked together with the Secretariat in developing two types of ICCAT tagging posters, tagging brochures, and all the components of the tagging kits. Now that all the necessary materials for the program are available for distribution, the tagging program is expected to be totally functional in 1990 and participation on both sides of the Atlantic will be actively encouraged in the coming year. Further details are reported in the general progress report (COM-SCRS/89/13).

#### OBJECTIVE 3 -- AGE AND GROWTH

Some important samples of skeletal structures for conducting age and growth research were obtained during the 1989 season. The otoliths and dorsal spines from two very large blue marlin (1,190 and 1,002 pounds), and a 139-pound white marlin were obtained from Bermuda, North Carolina (U.S.A.), and Dominican Republic, respectively. These exceptionally large specimens are critical for estimating maximum life span for these species. Four blue marlin were injected with oxytetracycline, tagged, and released by the western Atlantic coordinator during the October billfish tournament in Jamaica. This tournament (sponsored by the Billfish Foundation) is being conducted to validate the accuracy of aging methods for this species.