

## PROGRESS OF THE ICCAT ENHANCED RESEARCH PROGRAM FOR BILLFISH IN THE WESTERN ATLANTIC OCEAN DURING 1990

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## SUMMARY

Progress of the ICCAT Enhanced Research Program for Billfish in the western Atlantic Ocean during the 1990 sampling season is reported for seven different Caribbean locations. As of October 1990, a total of four observer trips were made on industrial longline boats targeting yellowfin tuna out of Cumaná, Venezuela. Passage of a new law regarding billfish landings near La Guaira, Venezuela, delayed work on the recreational fishery for billfish in this area. Research in Barbados benefited from the opening of a large, modern landing facility (Bridgetown complex) in St. James, which facilitated sampling because most billfish landings were processed through this facility. Grenada had a particularly good fishing year for tuna and thus fewer billfish were landed at this location. St. Maarten, Netherlands Antilles, had fewer Taiwanese longline vessels off-loading in this port than in prior years and only 180 billfish size frequency measurement were obtained in 1990. Many of the longline boats formerly off-loading in St. Maarten are not off-loading in Port of Spain, Trinidad. Port sampling will be initiated in Trinidad starting January 1991. Numerous biological samples from white marlin, intended for various biochemical analyses, were obtained from recreational billfish tournaments in the Dominican Republic during 1990; four Dominican Republic tournaments were sampled in 1990. The artisanal canoe fishery in Jamaica landed numerous marlin in 1990. Three Jamaican billfish tournaments were sampled in 1990. A paper on coordination of the ICCAT Enhanced Research Program for Billfish was presented to the International Symposium on Creel and Angler Surveys, held in Houston, Texas, during the spring of 1990 and will be published in the symposium proceedings.

A total of nine tag-recaptured billfish were obtained during the 1990 sampling season from ICCAT samplers in the western Atlantic Ocean; seven white marlin and one sailfish from Venezuela, one tag-recaptured white marlin from the Dominican Republic, and one tag-recaptured blue marlin from Barbados. An ICCAT working document summarizing a peer review paper on aging young blue marlin was submitted to the 1990 SCRS meeting.

## RESUME

La déroulement du Programme ICCAT de recherche intensive sur les istiophoridés dans l'Atlantique ouest pendant la saison d'échantillonnage 1990 est indiqué pour sept endroits différents des Antilles. Au mois d'octobre 1990, quatre campagnes d'observateurs en tout avaient été effectuées à partir de Cumana, Venezuela, à bord de palangriers industriels visant l'albacore. Le passage d'une nouvelle législation concernant les débarquements d'istiophoridés près de La Guaira, au Venezuela, a retardé les travaux sur la pêche sportive d'istiophoridés dans ce secteur. Aux Barbades, la recherche a été favorisée par l'ouverture à St. James d'une nouvelle infrastructure de débarquement (complexe de Bridgetown), ample et moderne, qui a facilité l'échantillonnage du fait que la plupart des débarquements d'istiophoridés y étaient traités. Grenada a connu une année particulièrement bonne pour les thonidés, et moins d'istiophoridés y ont donc été débarqués. Moins de palangriers taiwanais ont débarqué dans le port de St. Maarten, aux Antilles Néerlandaises, que les années antérieures, et 180 mensurations seulement d'istiophoridés ont été relevées en 1990. Un grand nombre de palangriers qui débarquaient auparavant à St. Maarten déchargent maintenant leurs prises à Port-of-Spain, à Trinidad. L'échantillonnage au port débutera à Trinidad à partir de janvier 1991. De nombreux échantillons biologiques de makaira blanc, destinés à diverses analyses bio-chimiques, ont été obtenus à l'occasion de championnats de pêche sportive aux istiophoridés en République Dominicaine en 1990; quatre championnats dominicains ont été échantillonnés en 1990. La pêche artisanale de pirogue à la Jamaïque a débarqué de nombreux marlins en 1990. Trois championnats d'istiophoridés ont été échantillonnés en 1990. Un document sur la coordination du Programme istiophoridés a été présenté à l'International Symposium on Creel and Angler Surveys, tenu à Houston, au Texas, au printemps 1990, et sera publié dans les comptes rendus du symposium.

Neuf recaptures d'istiophoridés marqués ont été effectuées pendant la saison d'échantillonnage de 1990 par des échantillonneurs ICCAT dans l'Atlantique ouest; 7 makaires blancs et un voilier au Venezuela, un makaira blanc en République Dominicaine, et un makaira bleu aux Barbades. Un document de travail de l'ICCAT résumant les travaux d'autorités de l'extérieur sur la détermination de l'âge du makaira bleu juvénile a été remis à la réunion de 1990 du SCRS.

## RESUMEN

Se informa acerca de los progresos del Programa ICCAT de investigación sobre Marlines en el océano Atlántico durante la temporada de marcado 1990 en siete diferentes localidades del Caribe. En octubre de 1990 se habían realizado cuatro campañas de observación a bordo de palangreros comerciales con base en Cumaná, Venezuela, dedicados a la pesca de rabil. La aprobación de una nueva ley sobre los desembarques de marlines cerca de La Guaira, Venezuela, retrasó las tareas en la pesquería de recreo para marlines en esta zona. La investigación en Barbados se benefició de la inauguración de unas nuevas instalaciones, amplias y modernas (el complejo Bridgetown) en St. James, lo cual simplificó las tareas de muestreo, ya que la mayor parte de los desembarques de marlines pasan por estas instalaciones. Granada tuvo un año de excelente pesca de túnidos por lo que los desembarques de marlines fueron más escasos. En St. Maarten, Antillas Holandesas, entró un menor número de palangreros taiwaneses que en otros años a descargar sus capturas, y en 1990 solo se efectuaron 180 mediciones de frecuencias de tallas. Gran parte de los palangreros que solían descargar en St. Maarten lo hace ahora en Puerto España, Trinidad. En esta localidad el muestreo se iniciará en enero de 1991. En la República Dominicana en 1990 y en el transcurso de torneos de pesca deportiva de marlín, se obtuvieron numerosas muestras biológicas de aguja blanca para realizar análisis bioquímicos; ese mismo año se realizó muestreo en cuatro torneos que tuvieron lugar en dicho país. La pesquería artesana de canosa de Jamaica obtuvo en 1990 un gran número de marlines, realizándose muestreo en tres torneos que tuvieron lugar allí. En el "International Symposium on reel and angler Surveys", en Houston, Texas (Estados Unidos) en la primavera de 1990, se presentó un documento sobre coordinación del Programa ICCAT de Investigación Intensiva sobre Marlines que será publicado en las actas de dicho simposio.

En la temporada de muestreo de 1990 se obtuvieron 9 marlines marcados, de muestreadores de ICCAT en el Atlántico oeste, 7 agujas blancas y un pez vela de Venezuela, 1 aguja blanca de la República Dominicana y 1 aguja azul de Barbados. En la reunión SCRS de 1990 se presentó un documento sobre determinación de la edad de juveniles de aguja azul.

## INTRODUCTION

Research activities during 1990 began on a limited scale shortly after the 1989 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 remain the Caribbean Sea and the west coast of Africa. The overall program coordinator during 1990 was Dr. Bradford Brown (U.S.A.); Dr. Eric Prince coordinated activities in the western Atlantic Ocean and Mr. Mr. Diouf Taib (Senegal) coordinated activities in the eastern Atlantic Ocean. The following report summarizes research activities in the western Atlantic Ocean.

## OBJECTIVE 1 -- LANDING STATISTICS

Coordination Travel in the Caribbean Sea

Dr. Eric Prince made several trips to Caribbean locations in 1990 as part of his responsibilities for program activities in the western Atlantic Ocean. The four trips made in 1990 (February, June, August, September) were to the following Caribbean locations: Grenada; Barbados; St. Maarten, Netherlands Antilles; Cancun, Mexico; Santo Domingo, Dominican Republic; St. Thomas, U.S. Virgin Islands; Cumaná, La Guaira, Margarita Island, Caracas, Carupano, and Port de la Cruz, Venezuela; and Port of Spain, Trinidad. The travel in February was for the purpose of finalizing 1990 research plans in each location, collecting data, and investigating possible expansion of program activities in some locations to include at-sea and shore-based sampling. Travel to the Dominican Republic in June was for the purpose of sampling a billfish tournament for biological samples. Travel to St. Thomas, U.S. Virgin Islands was for the purpose of sampling a blue marlin tournament for biological samples and obtaining a research proposal for expansion of ICCAT billfish work in this area. Travel to Venezuela and Port of Spain Trinidad in September was for the purpose of planning various research arrangements with the Director General of Fisheries for Venezuela concerning billfish and swordfish, instructing observers in Cumaná on filling out ICCAT at-sea forms, keeping track of the fishery, and arranging research activities in Port of Spain, Trinidad.

Drs. Prince and Brown presented a paper entitled "Coordination of the ICCAT Enhanced Research Program for Billfish" to the International Symposium on Creel and Angler Surveys, held in Houston, Texas, in the spring of 1990. Travel to present this paper was provided by the Symposium sponsors. The paper will be published in the proceedings of this symposium.

The following summarizes research progress according to

location and/or type of research activity.

Barbados. Size frequency measurements from 272 billfish (including 16 spearfish) were taken from the artisanal and recreational fisheries during 1990 by Dr. Hazel Oxenford of Bellairs Research Institute. One recreational tournament was also sampled. The total number of size measurements increased considerably from the previous year due to the opening of a large government off-loading dock in St. James (Bridgetown Complex). A short duration observer trip (3-4 days) on a Barbados longline vessel targeting swordfish will likely be made by the western Atlantic coordinator before the end of 1990.

Grenada. Size frequency measurements from about 200 sailfish and blue marlin were taken from the artisanal fishery during 1990 by the Ministry of Industrial Development and Fisheries. A report summarizing 1990 sampling activities was prepared for 1990 SCRS meeting. Grenada experienced unusually large catches of tuna during 1990 which somewhat reduced the number of billfishes caught by the artisanal fishery. In order to increase the number of billfish size measurements, sampling activities will begin in November, 1990, and continue until July 1991.

Jamaica. At least four billfish tournaments will be covered during the 1990 sampling season, most of which occur during October. Billfish were sampled from the artisanal canoe fishery during the year. A report summarizing all research activities will be submitted to the western Atlantic coordinator before the end of the year.

Dominican Republic. The Dominican Foundation to Preserve and Research the Marine Resources (MAMMA) assisted in collecting biological samples from 25 white marlin from the Cabeza de Toro billfish tournament in June, 1990. These samples were distributed to scientists working on species identification kits, mitochondria DNA stock identification (Billfish Foundation funded study), and sex identification projects (see below for more details). A total of four billfish tournaments were sampled during 1990.

Trinidad. Because of the large increase in industrialized longline activity in the area, port and at-sea sampling of Trinidadian and Taiwanese longline vessels will be initiated starting January, 1991. Funds for this sampling will be administered through the National Fisheries Company Limited in Port of Spain.

Cancun, Mexico. A large recreational fishery for billfish and at least 7 longline vessels targeting yellowfin tuna and swordfish exist in the Mexican Caribbean area. ICCAT was unable to initiate ICCAT billfish research activities in 1990. Another attempt to start research activities in this area will be made during early 1991.

Field Identification Kits. The research team at Florida Atlantic University (Boca Raton, FL) determined that a change in approach for development of the field kits for species identification was necessary. The simple approach of immunizing rabbits against billfish albumins to produce specific polyclonal antisera proved difficult because the antisera is inconsistent and cross-reactivity between species has not been eliminated with purification procedures. Therefore, monoclonal antisera will be produced, which is more consistent and has less cross-reactivity than polyclonal antisera. This will result in about 6 months delay in producing the test kits. The additional funds necessary for this change in approach are minimal (about \$1,200) because the research team has managed to obtain the majority of funding from non-ICCAT sources.

Mitochondrial DNA Stock Identification. Although this study is not directly funded by the ICCAT billfish program (The Billfish Foundation is funding this work), the ICCAT program has cooperated in obtaining biological sample from white marlin and blue marlin for this research, which is being conducted by scientists at the Virginia Institute of Marine Science and the Interamerican Tropical Tuna Commission.

Sex Identification of Dressed Carcasses. Finalization of this work is being completed and a report will be submitted for the 1990 ICCAT scientific meeting. The laboratory procedure, based on sampling red muscle tissue, works well for mature female billfishes and swordfishes (as well as numerous other teleosts), but can not distinguish between immature females and male sex categories.

St. Maarten Transshipment Port. Although many of the Taiwanese longline vessels that normally off-load here have been using Port of Spain, Trinidad, at least 180 blue and white marlin and sailfish have been measured during the 1990 sampling season.

Venezuelan At-sea Observer and Shore-based Sampling. At total of four observer trips have been accomplished in 1990 aboard industrialized longline vessels fishing for tuna and swordfish out of Cumana, Venezuela. Three more observer trips will be accomplished before the end of the year. Since this program started in 1987, at least 13 observer trips have been made which documents over 130 longline sets. A computer summary of these data, separated by season, are available for preliminary review. Shore-based sampling in Cumana harbor continued in 1990, but data for this activity have not been received by the western Atlantic Coordinator.

Venezuelan Recreational Fisheries. An ICCAT working document that summarizes recreational billfish research over the past 30 years has been prepared for the 1990 SCRS meeting. A new Venezuelan law requiring all billfish caught by recreational anglers near La Guaira to be released, except under special permit, has hindered most of the 1990 ICCAT research efforts in this area. Although size measurements of the landings will not be possible,

we intend to continue sampling this fishery for catch and effort data.

#### OBJECTIVE 2--TAGGING PROGRAM

ICCAT Billfish Tagging Program. Seven tag-recaptured white marlin and one sailfish were recovered from the Venezuelan longline and gillnet fisheries during 1990. One tag-recaptured blue marlin was recovered in Barbados and one tag-recaptured white marlin was recovered in the Dominican Republic during 1990. These tag-recaptures would probably not have been recovered by the NMFS tagging program and demonstrate the benefits of having an international tagging program through ICCAT. The ICCAT tagging kit, including all components, was completed and made available to participants.

#### OBJECTIVE 3--AGE AND GROWTH RESEARCH

Age and Growth Research. Unusual sized billfish were not obtained from ICCAT workers for age and growth studies during the 1990 sampling season, although a program being conducted by the Billfish Foundation in Florida obtained about a dozen very small swordfish and a few sailfish for age and growth analysis. An ICCAT working document which summarized a paper submitted to the Fishery Bulletin on estimating the age and growth of young blue marlin was prepared for the 1990 SCRS meeting.