

**PROGRESS OF THE ICCAT ENHANCED RESEARCH PROGRAM FOR BILLFISH
IN THE WESTERN ATLANTIC OCEAN DURING 1991**

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SUMMARY

Research activities of the ICCAT Enhanced Research Program for Billfish in the western Atlantic Ocean during 1991 are summarized by location and research objective. At-sea sampling of four Venezuelan industrial longline vessels targeting tuna and swordfish were accomplished in 1991 (two additional observer trips on tuna vessels and one observer trip on a swordfish vessel are now in progress). In addition to the normal at-sea sampling procedures, biological sampling of swordfish for reproductive organs and calcified structures (age and growth) was initiated during the 1991 sampling season. Shore-based sampling of billfish landings for size and sex data (and in some cases sampling of billfish tournaments for catch per unit effort data) was accomplished in Venezuela, Grenada, Barbados, U.S. Virgin Islands, St. Maarten, N.A., Dominican Republic, and Jamaica. Working documents of research activities are being submitted to ICCAT by several of the western Atlantic program cooperators and/or research and financial reports were submitted to the western Atlantic Coordinator by those not contributing working documents.

RESUME

Le présent document résume par location et par domaine de recherche les activités menées dans l'Atlantique ouest en 1991 dans le cadre du Programme istiophoridés. Quatre palangriers industriels vénézuéliens visant les thonidés et l'espadon ont été échantillonnés en mer en 1991 (deux autres campagnes d'observateurs à bord de thoniers et une sur un bateau pêchant l'espadon sont actuellement en cours). Outre les activités normales d'échantillonnage en mer, on a commencé en 1991 l'échantillonnage biologique des organes reproducteurs et des structures osseuses de l'espadon (âge et croissance). L'échantillonnage à bord des débarquements d'istiophoridés à la recherche de données sur la taille et le sexe (et dans certains cas l'échantillonnage des championnats de pêche d'istiophoridés pour les données de prise par unité d'effort) a été mené au Venezuela, à Grenade, aux Barbades, aux îles Vierges américaines, à St. Maarten (Antilles néerlandaises), en République Dominicaine et à la Jamaïque. Des documents de travail sur les activités de recherche ont

été remis à l'ICCAT par plusieurs collaborateurs du programme pour l'Atlantique ouest et/ou des rapports sur la recherche et le financement ont été remis au coordinateur de l'Atlantique ouest par les personnes qui n'avaient pas remis de documents de travail.

RESUMEN

El documento resume las actividades de investigación del Programa ICCAT de Investigación Intensiva sobre Marlines en el Atlántico oeste en el año 1991, por zona y objetivo. Se llevó a cabo muestreo en la mar de cuatro palangreros industriales venezolanos dedicados a la pesca de túnidos y pez espada (actualmente se están llevando a cabo dos campañas adicionales de observadores a bordo de atuneros y una a bordo de un barco que pesca pez espada). Además de proseguir el muestreo rutinario en la mar, en 1991 se inició muestreo biológico de los órganos de reproducción y estructuras calcificadas de pez espada (edad y crecimiento). En Venezuela, Granada, Barbados, islas Vírgenes (USA), St. Maarten (Antillas Holandesas), República Dominicana y Jamaica, se realizó muestreo en puerto de los desembarques de marlines para obtener datos de talla y sexo (y en algunos casos se llevó a cabo muestreo en los campeonatos de pesca de marlin para obtener datos de captura por unidad de esfuerzo). Se presentan a ICCAT documentos preparados por colaboradores del programa en el Atlántico oeste que tratan sobre la investigación. Se enviaron al coordinador del programa en el Atlántico oeste informes financieros y/o científicos.

INTRODUCTION

Research activities during 1991 began immediately after the first of the year. The objectives presented in the initial program plan in 1986 (Appendix 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 1991 was Dr. Bradford E. Brown (U.S.A.); Dr. Eric D. Prince (U.S.A.) was the coordinator for the western Atlantic Ocean, and Mr. Taib Diouf (Senegal) and Mr. Martin Mensha (Ghana) coordinated activities for the eastern Atlantic Ocean. The following are the coordinating activities realized by this program during 1991 in the western Atlantic Ocean.

OBJECTIVE 1 -- LANDING STATISTICS

Coordination Travel in the Caribbean Sea

Dr. Eric Prince made 3 trips to Caribbean locations in 1991 as part of his coordinating responsibilities for program activities in the western Atlantic ocean. The three trips made in 1991 (March and April) were to Caribbean locations that had participated in the billfish program the previous year and included stops in Cumana, La Guaira, and Carupano, Venezuela; St. Maarten, Netherlands Antilles; Barbados; and Grenada. Mr. Freddy Arocha (hired by the National Marine Fisheries Service, NMFS, through the University of Miami to work on swordfish biology) accompanied Dr. Prince on his trip to Venezuela to assist in initiating billfish and swordfish work in this location. Travel in the early part of the year was for the purpose of finalizing 1991 research plans for each location, collecting data, train samplers, and investigating possible expansion of program activities in some locations. Mr. Arocha also made a trip to Cumana, Venezuela, in June, 1991, to collect data, and to train samplers in biological sampling of swordfish. Mr. Arocha will likely make one more trip to Cumana prior to December 31, 1991, for the purpose of transporting frozen biological samples back to Miami.

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

Grenada. The ministry of industrial development and fisheries continued shore-based sampling activities of the artisanal fisheries during the 1990-1991 season. Over 1,000 carcass measurements, mostly of sailfish, were submitted to the western Atlantic coordinator and these data are summarized in an ICCAT working document SCRS/91/107. In addition, the annual Spice Island billfish tournament held in Grenada, was also sampled

for catch/effort data, as well as size and sex information. Two tagged sailfish were recaptured in Grenada and reported to the western Atlantic coordinator during 1991. Both tagged sailfish were originally tagged and released in the northeast Gulf of Mexico. In August, 1991, Grenada received a shipment of 8 small, diesel-powered longline vessels (each 11 m long) through a cooperative agreement with a Japanese company. After these vessels are in operation during the fall and winter of 1991, the western Atlantic coordinator will make a short trip on one of these boats to observe longline operations and catches. At-sea sampling of these boats will also be initiated as soon as these vessels are in operation (possibly as early as November, 1991).

Barbados. Dr. Hazel Oxenford of the Bellairs Research Institute submitted a report to the western Atlantic coordinator which combined some of the most recent landings statistics (1991) with the historical data set from the Barbados artisanal fishery. Although shore-based sampling of the artisanal fishery was slowed during 1991 due to a reduction in the longline effort, a total of 6 recreational billfish tournaments were sampled during the 1991 sampling season. One tagged blue marlin was recaptured in Barbados and reported to the western Atlantic coordinator during 1991. This fish was originally tagged in St. Thomas, U.S. Virgin Islands, and was at-large for 7 months.

Jamaica. Dr. Guy Harvey of the University of the West Indies submitted a report to the western Atlantic coordinator which summarized the 1990 sampling activities. A total of four recreational billfish tournaments were covered in Jamaica in 1990 and a similar number of tournaments will be sampled in 1991 (held primarily in October and November). The data collected on recreational billfish tournaments includes data on catch and effort, as well as size and sex information of the landed billfish (mostly blue marlin). Shore-based sampling of the artisanal canoe fishery was also conducted in 1990 and 1991. Biological samples (heart, liver, and muscle tissue) of blue marlin and 2 longbill spearfish were obtained by Dr. John Graves (Virginia Institute of Marine Science) during his trip to Jamaica to attend the 1991 Antonio billfish tournament and will be used in a Mt-DNA stock identification study which is funded by The Billfish Foundation.

Dominican Republic. Mr. Mario Delgado of the Dominican Foundation to Preserve and Research the Marine Resources (MAMMA) sampled 3 billfish tournaments for catch and effort statistics, and size and sex data of the landed billfishes.

Venezuela. At-sea and shore-based sampling activities continued at the port of Cumana, where at least 19 industrialized longline vessels target yellowfin tuna, but also catch billfish. At-sea biological sampling (reproductive organs and calcified structures) of swordfish aboard longline vessels fishing out of Port de la Cruz was initiated in 1991 and this resulted in samples from 70 swordfish from four different trips. Three at-sea trips was also sampled on longline boats targeting yellowfin tuna out of

Cumana Harbor. At the present time, one tuna observer trip is in progress. Shore-based sampling for size frequency data was also conducted on the artisanal fisheries in Margarita Island and La Guaira, Venezuela. Shore-based sampling of the recreational fishery for billfish in La Guaira, including all billfish tournaments held in Playa Grande Marina, continued in 1991. These data are being summarized in two different ICCAT working documents and will be presented to the 1991 SCRS.

St. Maarten, Netherlands Antilles. Shore-based sampling at the Nichirei Carib Corporation in St. Maarten, N.A., continued in 1991. Sampling at this location is from the large Asian longline fleets where billfish carcasses are off-loaded without heads, fins, and viscera. A report submitted to the western Atlantic coordinator included size measurements from about 207 white marlin and sailfish. In addition, size frequency data from 250 albacore were also received and forwarded to the ICCAT secretariat in Madrid.

U.S. and British Virgin Islands. Swordfish longline activity in this location was almost non-existent in 1991 and thus, at-sea observers could not be deployed. Shore-based sampling of tournament and non-tournament recreational fisheries for billfish were initiated in St. Thomas and a brief report summarizing these activities was submitted to the western Atlantic coordinator. About 500 recreational vessels were included in sampling activities during the 70 days fishing activities were monitored.

Species Identification Kits

The research team from Florida Atlantic University summarized 1991 research activities on the development of a field species identifications kit for billfish in an ICCAT working document (SCRS/91/107). A prototype test field kit will be available for examination by ICCAT scientists at the 1991 SCRS meeting in Madrid. The team produced several monoclonal anti-bodies with varying degrees of specificity towards sailfish albumin. One of these anti-bodies shows a high specificity towards sailfish serum, no cross-reactivity with marlin, and will be used in the assembly of the first prototype kit. The methods used in this break-through will simplify the same approach for both species of marlin, which will be done in early 1992 (provided funding is available).

OBJECTIVE 2 -- BILLFISH TAGGING PROGRAM

The western Atlantic coordinator assisted in the development of an ICCAT billfish tagging Tee shirt which will be used primarily in the eastern Atlantic as an incentive to increase participation in the tagging program. In addition, the western Atlantic coordinator responded to requests for ICCAT tagging kits from several Caribbean locations during 1991. Because of the existence of the ICCAT Enhanced Research Program for Billfish in the western Atlantic and development of provisions in many Caribbean locations

for promptly paying of tagging rewards, considerable numbers of recaptured billfish continued to be retrieved during the 1991 sampling season, particularly from Venezuela, Barbados, and Grenada.

OBJECTIVE 3 -- AGE AND GROWTH

Calcified structures from unusually large billfish were not available in the western Atlantic ocean during 1991. However, several dozen juvenile sailfish and swordfish samples (less than 5 kgs) were obtained from the Florida keys through a incentive program sponsored by The Billfish Foundation. These juvenile billfish samples are collected by examining the stomachs of larger predators. In addition, the western Atlantic coordinator was recently notified of a tagged white marlin recaptured off of Pensacola, FL, after being at-large for 6.1 years (it was originally tagged in the Gulf of Mexico). The entire fish was saved for scientific examination and this will be the first instance where ICCAT will pay a reward for recovery of calcified structures from a tagged billfish. A detailed paper on estimating the age of young Atlantic blue marlin (summarized in a 1990 working document, SCRS/90/84) was published in the U.S. Fishery Bulletin in 1991.