

PROGRESS OF THE ICCAT ENHANCED RESEARCH PROGRAM FOR BILLFISH IN THE WESTERN ATLANTIC OCEAN DURING 1993

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SUMMARY

Research activities of the ICCAT Enhanced Research Program for Billfish in the western Atlantic Ocean during 1993 are summarized by location and research objective. At-sea sampling of more than 30 Venezuelan industrial longline vessels based out of Cumaná targeting tuna or swordfish was accomplished in 1993. Biological sampling of about 500 swordfish for reproductive organs and calcified structures (age and growth) was carried out during the 1993 sampling season. Pilot studies involving the western Atlantic Coordinator and members of CARICOM for tagging sailfish off Grenada and St. Vincent were delayed but will likely be initiated in November/December, 1993. 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 carried out from Venezuela, Grenada, Trinidad and Tobago, St. Maarten, U.S. Virgin Islands, and Bermuda. Program participants in Venezuela, Grenada, and Barbados helped obtain information on more than two dozen tag-recaptured billfish in the western Atlantic Ocean. Hard parts used for age and growth analysis were sampled from several dozen juvenile billfish and one 1,200 pound blue marlin during 1993. Staff at the Southeast Fisheries Center prepared and developed computer files of more than 35 working documents which were submitted to the ICCAT Secretariat so final preparations could be accomplished in publishing the proceedings of the Billfish Workshop. The proceedings of the Second ICCAT Billfish Workshop book will be published during the winter of 1993/94. The western Atlantic Coordinator also spent considerable time, particularly early in the year, in obtaining funds for the Program and 1993 financial contributions include: The Billfish Foundation, South Florida Fishing Classic, Offield Foundation, and the National Fish and Wildlife Foundation.

RESUME

Les activités de recherche du Programme intensif de l'ICCAT sur les istiophoridés dans l'océan Atlantique ouest, réalisées en 1993, sont récapitulées par secteur et objectif de recherche. L'échantillonnage en mer de plus de 30 palangriers industriels vénézuéliens basés à Cumaná et visant les thonidés ou l'espadon a été mené à bien en 1993. L'échantillonnage biologique d'environ 500 espadons pour les organes reproducteurs et les structures calcifiées (âge et croissance) a été réalisé au cours de la saison d'échantillonnage de 1993. Des études pilotes, que le Coordinateur de l'Atlantique ouest et les membres du CARICOM avaient envisagés de mener à bien pour marquer des voiliers au large de Grenade et St. Vincent ont été retardées mais commenceront probablement en novembre/décembre 1993. L'échantillonnage basé à terre sur les débarquements d'istiophoridés pour obtenir les données de taille et de sexe (et dans certains cas, l'échantillonnage de championnats d'istiophoridés pour obtenir les données de prise par unité d'effort) a été effectué au Venezuela, Grenade, Trinidad et Tobago, St. Maarten, Îles vierges des États-Unis et le Bermude. Les participants au programme du Venezuela, Grenade et Barbades ont permis d'obtenir des informations sur plus de deux douzaines de retours de marques d'istiophoridés dans l'océan Atlantique ouest. Des pièces dures utilisées pour l'analyse de l'âge et la croissance ont été échantillonnées sur plusieurs douzaines de juvéniles et un makaira bleu de 1.200 livres durant la période 1993. Le personnel du Southeast Fisheries Center a préparé et élaboré des fichiers d'ordinateur de plus de 35 documents de travail qui ont été présentés au Secrétariat de l'ICCAT pour permettre de mettre un point final à la publication des comptes rendus des journées d'étude sur les istiophoridés. Le volume des comptes rendus des Secondes journées d'étude de l'ICCAT sur les istiophoridés sera publié en hiver 1993/94. Le Coordinateur de l'Atlantique ouest a également passé un temps considérable, surtout en début d'année, à obtenir des fonds pour le programme et les contributions financières de 1993 venaient de: la Billfish Foundation, South Florida Fishing Classic; Offield Foundation et National Fish and Wildlife Foundation.

RESUMEN

Se resumen, por situación geográfica y objetivo de investigación, las actividades de investigación del Programa ICCAT de Investigación Intensiva sobre Marlines en el Océano Atlántico oeste durante 1993. En ese mismo año se llevó a cabo muestreo en la mar de más de 30 palangreros industriales venezolanos con base frente a Cumaná que perseguían túnidos o pez espada. Se llevó a cabo muestreo biológico de órganos reproductores y estructuras calcificadas (edad y crecimiento) de unos 500 ejemplares de pez espada durante la temporada de muestreo de 1993. Se han retrasado los estudios pilotos que implicaban al Coordinador del Atlántico oeste y a miembros de CARICOM en marcado de pez vela frente a Granada y St. Vincent, pero probablemente se iniciarán en noviembre/diciembre de 1993. Se efectuó muestreo en la orilla de los desembarques de marlines, para obtener datos de talla y sexo (y en algunos casos, muestreo de concursos de pesca de marlines para obtener datos de captura por unidad de esfuerzo) en Venezuela, Granada, Trinidad y Tobago, St. Maarten, Virgin Islands (EE.UU.) y Bermuda. Los participantes en el Programa en Venezuela, Granada y Barbados ayudaron a obtener información sobre más de dos docenas de marlines marcados-recapturados en el Océano Atlántico oeste. Las partes duras utilizadas para análisis de edad y crecimiento se muestrearon a partir de varias docenas de marlines juveniles y una aguja de 1200 libras durante 1993. Miembros del personal de "Southeast Fisheries Center" prepararon y desarrollaron ficheros informáticos de más de 35 documentos de trabajo que fueron presentados a la Secretaría de ICCAT para que las versiones finales pudiesen estar terminadas en el momento de publicar las Actas de las Jornadas sobre Marlines. El volumen conteniendo las actas de las Segundas Jornadas ICCAT sobre Marlines será publicado durante el invierno de 1993/94. El Coordinador del Atlántico oeste también pasó bastante tiempo, sobre todo a comienzos del año, obteniendo fondos para el Programa y en particular, contribuyeron financieramente: "The Billfish Foundation", "South Florida Fishing Classic", "Offield Foundation" y "National Fish and Wildlife Foundation".

INTRODUCTION

Research activities during 1993 began immediately after the first of the year but several activities were delayed due to limited funding. The objectives presented in the initial program plan in 1986 (Appendix to Annex 12 of Report of 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 1993 was Dr. Bradford E. Brown (U.S.A.); Dr. Eric D. Prince (U.S.A.) was coordinator for the western Atlantic Ocean, and Mr. Taib Diouf (Senegal) and Mr. Martin Mensha (Ghana) coordinated activities for the eastern Atlantic Ocean (SCRS/92/70 and SCRS/92/75). The following are the coordinating activities realized by this program during 1993 in the western Atlantic Ocean.

Funding

At the start of the year, activities of the western Atlantic coordinator (Prince) concentrated on obtaining program funds and the lack of funds during the first quarter delayed some research activities. However, two major grants were obtained by mid-year: one from the Offield Foundation (\$30 K) and one from the Fish and Wildlife Foundation (\$22 K). Smaller contributions from the Billfish Foundation (\$10 K) and South Florida Fishing Classic (\$5 K) were also made. In addition, the U.S. National Marine Fisheries Service contributed funds (\$60 K) so the program can continue through at least the 1995 sampling season.

Publication of Second ICCAT Billfish Workshop

At the request of the ICCAT Secretariat, Southeast Fisheries Service staff spent considerable time during the first quarter preparing computer files of papers and working documents that will be published in the proceedings of the Second ICCAT Billfish Workshop. A portion of the grant from the Offield Foundation was made so this publication can be bound in hard cover. The book is planned for publication by the winter 1993/94 or spring of 1994.

OBJECTIVE 1 -- LANDING STATISTICS

Coordination Travel in the Caribbean Sea

The western Atlantic coordinator made one trip to Caribbean locations in 1993 as part of his coordinating responsibilities. The trip was delayed until mid-July because of delays in obtaining 1993 operational funds. The trip was made to the following locations: Caracas and Cumana, Venezuela, Grenada, St. Vincent, St. Martten, N.A., and San Juan, Puerto Rico, in order to train

samplers, collect data, and to meet with fisheries officials to plan research activities. Mr. Freddie Arocha (funded by the National Marine Fisheries Service, NMFS, through the University of Miami to work on swordfish biology), made 2 trips to Venezuela in 1993. The first trip in March was to establish and confirm the annual sampling scheme, train samplers, and return biological samples to Miami. The coordination trip in July was made to train new observers, pick up the large volume of frozen biological samples, and collect data. Mr. Arocha will likely travel to Venezuela around the first of the year to collect data and obtain biological samples.

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

Barbados. Dr. Hazel Oxenford of the Bellairs Research Institute attended the annual recreational billfish tournament and these data were submitted to the western Atlantic coordinator. Some tagging activities were initiated in the Barbados tournament and the western Atlantic coordinator assisted Dr. Oxenford by requesting ICCAT billfish tagging kits for this purpose. The shore-base sampling in Barbados for 1993 was not conducted due to the low fishing effort and sparse billfish landings.

Grenada. The ministry of industrial development and fisheries continued shore-based sampling activities of the artisanal fisheries during the 1993 season. About 500 carcass measurements (mostly sailfish) were submitted to the western Atlantic coordinator during 1993 but considerable data is still being quality controlled prior to submission. Sampling of CPUE and size and sex information for the annual Spice Island Billfish Tournament held in Grenada, was also accomplished in 1993. Plans for conducting tagging cruises on small diesel-powered longline vessels were confirmed and will start by the end of the year. CARICOM staff also obtained updated CPUE data from Grenada for use in the western Atlantic sailfish assessment conducted by Southeast Fisheries Center staff. These data were obtained too late to be included in this year's assessment but will be used in future western Atlantic sailfish assessments.

Jamaica. Dr. Guy Harvey supervised 1993 sampling activities primarily on recreational billfish tournaments, but also some shore-based sampling of the artisanal canoe fishery was accomplished during 1993. Since billfish tournaments in Jamaica are normally held in the fall, data are usually not submitted before the end of the year.

St. Maarten, N.A. The western Atlantic coordinator assisted employees of the Nicheiri Carib Corporation in shore-base sampling of the landings from Taiwanese longline vessels using St. Maarten as a transshipment port. For 1993, a total of more than 700 billfish carcasses were sampled for size frequency information. Most of these were white marlin, with a few blue marlin, sailfish,

and spearfish included. Since some of the medium size carcasses had pectoral and anal fins attached and Nicheiri staff were given specific guidelines for species identification under these circumstances.

Trinidad and Tobago. Shore-base sampling of the industrial longline vessels (mostly Taiwanese vessels) that off-load in the Port of Spain was continued on a limited basis in 1993 under the direction of Dr. Christine Chan-A-Shing, Ministry of Food Production & Marine Exploitation. Size frequency measurements from dressed carcasses taken at the National Fisheries Company freezers included about 115 billfish, mostly blue and white marlin .

Venezuela. At-sea sampling activities continued at the port of Cumana, where the fleet of 28 industrialized longline vessels target yellowfin tuna and swordfish, but also catch billfish. A total of over 30 observer trips are anticipated by the end of the year and this represents about 16% coverage for the fleet activities in 1993. Because of the large volume of incoming data, particularly from at-sea observers, computer entry of these data has not kept pace and about half the data has not yet been entered. Biological samples consisting of reproductive organs and skeletal structures were also collected from over 500 swordfish during at-sea sampling activities. Shore-based sampling in Venezuela continued to expand during 1993, with harbor sampling in Juangriego and Playa Verde, in addition to Cumana and La Guaria. Size frequency data from over 1,500 billfish were collected in 1993. Sampling of recreational tournaments held primarily in Playa Grande Marina, continued in 1993, but at least one tournament was sampled in the island of Curacao.

U.S. Virgin Islands. Swordfish longline activity in this location did not take place during 1993 and thus, at-sea sampling could not be accomplished. Shore-based sampling of several billfish tournaments were conducted during 1993. Dr. Steven Myers has recently been selected to head the Division of Fisheries and has informed the western Atlantic coordinator of his intention to participate more activity in the ICCAT billfish program.

Species Identification Kits. The research team from Florida Atlantic University is concluding its work on the development of species identification kits for billfish. A summary of all research to date was submitted as a large report to the U.S. National Marine Fisheries Service since SK funds were granted to continue funding this work. A quick bead assay test, which is highly sensitive for Atlantic sailfish, has been completed and a number of these kits will be available for testing of false positive before the end of the year. However, due to the instability of clones for Atlantic blue marlin and white marlin, the quick bead assays for these species are delayed and will probably not be available for testing until the beginning of next year.

OBJECTIVE 2 -- BILLFISH TAGGING PROGRAM

The western Atlantic Coordinator responded to numerous requests for ICCAT tagging kits from several Caribbean locations during 1993, including new tagging participants in Trinidad and St. Lucia and increased tagging efforts in Barbados. The Spanish language version of the new tag-recapture card developed by the National Marine Fisheries Service (NMFS) continued to be distributed in Venezuela as a trial for determining its effectiveness for increasing the quality and quantity of data received. A working document was submitted to the 1993 SCRS which analyzes the effect of implementing ICCAT billfish tagging procedures in the southeast Caribbean Sea to improving tag recapture rates for billfish. Preliminary information indicates that overall billfish recapture rates in the southeast Caribbean areas increased 9% since the implementation of the program in 1987. Species specific data from this analysis indicate that the most abundant billfish in this area (white marlin) had a 25% increase in recapture rates. These recaptures were mainly from longline boats and all carried NMFS tags. In addition, numerous billfish with tags from The Billfish Foundation, as well as many tag-recaptured sharks from the NMFS tagging program in Rhode Island are also being obtained from southeast Caribbean areas with ICCAT billfish agents. The majority of tagging activity for the ICCAT billfish tagging program, in terms of number of releases, occurred off Dakar, Senegal.

OBJECTIVE 3 -- AGE AND GROWTH

Calcified structures from 39 juvenile swordfish and 5 sailfish were obtained from The Billfish Foundation's sampling program in the Florida Keys during 1993. These juvenile billfish samples are collected by examining the stomachs of larger predators. Most of the otoliths from these samples were shipped to Dr. Chuck Wilson, Louisiana State University, for age and growth evaluation. In addition, hardpart samples from a 1200 pound blue marlin caught in Bermuda was shipped to the Southeast Fisheries Center by Dr. Brian Luckehurt of the Fisheries Division. A report of a 1650 pound (750 kilo) black marlin caught in the northeast Atlantic south of Portugal was reported to the western Atlantic coordinator by Dr. Karim Erzini of the Universidade Do Algarve. However, the species identification of this report has not been verified at this time.