

## PROGRESS OF THE ICCAT ENHANCED RESEARCH PROGRAM FOR BILLFISH IN THE WESTERN ATLANTIC OCEAN DURING 1997

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### SUMMARY

Research activities of the ICCAT Enhanced Research Program for Billfish in the western Atlantic Ocean during 1997 are summarized by location and research objective. At-sea sampling with observers on Venezuelan industrial longline vessels accomplished 18 trips by October, 1997, and more are targeted before the end of the year. Most of these vessels are based out of Cumana targeting tuna or swordfish. Biological sampling of swordfish and istiophorids for reproductive studies and genetics research were continued during 1997 sampling season. Shore-based sampling of billfish landings for size and sex data, as well as tournament sampling were obtained from Venezuela, Grenada, U.S. Virgin Islands, Bermuda, Barbados, St. Maarten, Netherlands Antilles, and Brazil. Program participants in Venezuela, Grenada and Barbados continued to assist in obtaining information on tag-recaptured billfish, as well as numerous sharks, in the western Atlantic Ocean during 1997, a total of 70 tag recoveries were submitted to the Program Coordinator in 1997. The Federation of Japan Tuna Fisheries Co-operative Associations (JTFCOA) reported that tag release activities for billfish were initiated from its vessels in 1996 and this program is continuing in 1997. The amount of JTFCOA tagging activity during 1997 will not be known until these boats report back to port later in the year. Age and growth samples from several billfish were obtained during 1997. Editorial revisions of almost two dozen working documents submitted to the Third ICCAT Billfish Workshop (held in July, 1996) were edited by NMFS staff by July, 1997, and submitted to the ICCAT Secretariat for publication in an upgraded format.

### RÉSUMÉ

Les activités de recherche réalisées dans l'Atlantique Ouest en 1997, dans le cadre du Programme ICCAT de Recherche Intensive sur les Istiophoridés, sont récapitulées par zone et objectif de recherche. A la date d'octobre 1997, un échantillonnage en mer avec des observateurs à bord de palangriers industriels vénézuéliens a été mené avec 18 sorties, et d'autres sont prévues avant la fin de l'année. La plupart de ces bateaux ont leur port d'attache à Cumana et ciblent les thonidés ou l'espadon. L'échantillonnage biologique de l'espadon et des istiophoridés destiné à des études sur la reproduction et la génétique s'est poursuivi au cours de la saison d'échantillonnage de 1997. Un échantillonnage à terre des débarquements d'istiophoridés pour obtenir des données de taille et de sexe, ainsi qu'un échantillonnage lors des tournois de pêche du Venezuela, de Grenade, des Iles Vierges (Etats-Unis), des Bermudes, des Barbades, de St. Maarten, des Antilles Néerlandaises et du Brésil, ont été réalisés. Les participants au Programme au Venezuela, à Grenade, et aux Barbades ont continué d'aider à l'obtention d'information sur la récupération d'istiophoridés marqués, ainsi que de nombreux requins, dans l'Océan Ouest Atlantique en 1997 - au total, en 1997, 70 marques récupérées ont été envoyées au Coordinateur du Programme. La Federation of Japan Tuna Fisheries Cooperative Associations (JTFCOA) a indiqué que des activités de marquage-remise à l'eau avaient été commencées en 1996 par ses bateaux pour les istiophoridés, et que ce programme se poursuivait en 1997. On ne connaît pas le volume des activités de marquage réalisées par la JTFCOA en 1997 jusqu'à ce que ses bateaux rentrent au port plus tard dans l'année. En 1997, on a obtenu des échantillons de plusieurs istiophoridés pour l'étude de la taille et de l'âge. En date de juillet 1997, le personnel du National Marine Fisheries Service (NMFS) avait révisé deux douzaines de documents de travail présentés aux Troisièmes Journées d'étude de l'ICCAT sur les Istiophoridés (tenues en juillet 1996), et les avait transmis au Secrétariat de l'ICCAT pour qu'ils soient publiés dans un format particulièrement soigné.

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## RESUMEN

Las actividades de investigación realizadas durante el año 1997 en el marco del Programa ICCAT de Investigación Intensiva sobre Marlines, en el Atlántico oeste, se resumen por zona y objetivo de la investigación. A octubre de 1997 se habían llevado a cabo 18 salidas en palangreros industriales venezolanos para hacer muestreo en la mar con observadores a bordo, habiéndose programado algunas salidas más antes de finales del mismo año. La mayor parte de los barcos están dedicados a la pesca de túnidos o pez espada y tienen su base en Cumaná. Durante 1997 continuó el muestreo biológico de pez espada y de istioforideos, destinado a estudios sobre reproducción y genética. Se realizó muestreo en tierra en los desembarques de marlines para obtener datos de talla y sexo, y también se hizo muestreo en los campeonatos de pesca en Venezuela, Grenada, Islas Vírgenes (EE.UU), Bermudas, Barbados, St. Maarten, Antillas Holandesas y Brasil. Los participantes en el programa en Venezuela, Grenada y Barbados continuaron contribuyendo a la obtención de información sobre la recuperación de marlines marcados, así como tiburones, en el Atlántico oeste. En 1997 se enviaron 70 marcas recuperadas al Coordinador del Programa. La *Federation of Japan Tuna Fisheries Cooperative Associations (JTFC)*, comunicó que en 1996 sus barcos habían iniciado actividades de marcado de marlines, que continuaban en 1997. El volumen del marcado de la JTFC no se conocerá hasta que los barcos regresen a puerto a finales de año. En 1997 se obtuvieron muestras de varios marlines para el estudio de la edad y crecimiento. A julio de 1997, el personal del *National Marine Fisheries Service (NMFS)* había revisado dos docenas de documentos de trabajo presentados a las Terceras Jornadas de Trabajo sobre Marlines (julio 1996), enviándolos a la Secretaría de ICCAT para su publicación en un formato esmerado.

## INTRODUCTION

Research activities during 1997 began immediately after the SCRS meeting in October, 1997. The objectives 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) Initiate and 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 1997 was Dr. Joseph E. Powers (U.S.A.); Dr. Eric D. Prince (U.S.A.) was coordinator for the western Atlantic Ocean, and Dr. Taib Diouf (Senegal) and Mr. Martin Mensha (Ghana) coordinated activities for the eastern Atlantic Ocean.

The NMFS Miami staff spent considerable time in early 1997 editing and upgrading working documents submitted for inclusion to the Third ICCAT Billfish Workshop Report. The workshop report, as well as associated working documents, will be published in a hardbound cover (special funding for this provided by The Billfish Foundation). The Western Atlantic Coordinator traveled to Messina,

Italy, to attend an intercessional ICCAT meeting to establish the ICCAT tag recovery network. This network will attempt to increase tag recoveries for both billfishes as well as tunas. During this same trip the Western Atlantic Coordinator visited Morocco to make a presentation on the billfish tagging program and arrange for a north African coordinator of the tag recovery network (travel costs to Italy and Morocco were covered at no cost to the billfish budget). The Western Atlantic Coordinator also visited Madeira, Portugal, in order to make a presentation on tagging to the Portuguese Fisheries Agency and initiate a pilot project using popup satellite tags on Atlantic blue marlin. The following coordination activities were realized by this program during 1997 in the western Atlantic Ocean.

### OBJECTIVE 1 -- LANDING STATISTICS

Dr. Freddy Arocha with the University of Miami (supported by National Marine Fisheries Service funds), made a trip to Miami during the first part of 1997 to finalize work on swordfish biology, establish and confirm the annual ICCAT billfish sampling schemes in Venezuela, submit data (including tag recoveries), and return biological samples to Miami. Dr. Mark Farber (NMFS SEFSC staff), traveled on behalf of the Western Atlantic Coordinator to Grenada and St. Maarten, Netherlands Antilles, during the first part of 1997 to sample billfish tournaments for catch and effort data and obtain biological samples for DNA analysis. Dr. Farber also took size frequency data from billfish off-loaded at the Nichirei transshipment port in St. Maarten.

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

Barbados. The shore-base sampling in Barbados was not conducted due to low fishing effort but at least 7 recreational billfish tournament were covered in 1997. Summaries of catch and effort data from these recreational billfish tournaments are normally were submitted to the western Atlantic Coordinator at the end of the year.

Bermuda. Dr. Brain Luckhurst of the Bermuda Division of Fisheries continues to collect catch and effort statistics from billfish tournaments in this location. Dr. Luckhurst has summarized these research activities in papers submitted to the past two ICCAT billfish workshops.

Brazil. Dr. Alberto Amorim of Institute de Pesca continues his billfish tagging activities, as well as biological sampling of billfish heart tissue for Mitochondria DNA research. The heart tissue samples were shipped to Dr. John Graves (Virginia Institute of Marine Science) for his work on stock structure on Atlantic billfish.

Grenada. The ministry of industrial development and fisheries continued shore-based sampling activities of the artisanal fisheries during the 1997 season. Dr. Mark Farber, NMFS SEFSC staff, attended the Spice Island Billfish Tournament to sampling CPUE, size and sex information of billfish landings.

Jamaica. Dr. Guy Harvey continues to collect data at recreational tournaments including size and sex information of the landed fish, as well as catch and effort data. Most of this activity takes place in the fall to coincide with the billfish tournament schedule.

St. Maarten, N.A. Dr. Mark Farber made a trip to St. Maarten in 1997 to sample the annual billfish tournament, as well as sample size frequency data from billfish landings from the Nichirei Carib Corporation. The billfish tournament sponsors provided Dr. Farber's lodging during this trip.

St. Vincent. Members of CARICOM and St. Vincent Ministry of Fisheries staff could not make additional longline cruises before the end of the year to test the feasibility of using live bait to increase the catch, tag, and release efforts for billfish in this area. This activity will be re-evaluated at the end of this year to determine if it is appropriate to continue this research next year.

Trinidad and Tobago. Shore-base sampling of the industrial longline vessels (mostly Taiwanese vessels) that off-load in the Port of Spain is normally carried out by Dr. Christine Chan-A-Shing, Ministry of Food Production and Marine Exploitation. However, due to recent changes in the ownership of the large freezer facility in Port of Spain, shore-based sampling was not conducted during 1997. With consideration of budgetary constraints, this work may be re-activated next year.

Venezuela. At-sea sampling activities of FONAIAP continued at the port of Cumana, where the fleet of industrialized longline vessels target yellowfin tuna and swordfish, but also catch billfish. In addition, the fleet of smaller artisanal vessels often target billfish. There were 18 at-sea observer trips reported to the western Atlantic Coordinator since the last SCRS meeting, and at least 30 trips are anticipated by the end of 1997. Several of these trips were made on the larger Korean type longline vessels and smaller artisanal boats, but most were made on the mid-size industrialized longline boats. Biological sampling of billfish consisted of collecting heart tissue and anal spines from about 300 fish during 1997 at-sea sampling activities. Shore-based sampling in Venezuela continued during 1997, with harbor sampling in Juangriego and Playa Verde, in addition to Cumana and La Guaria. Sampling of 3 recreational tournaments held in Playa Grande Marina as well as Puerto Cabello and Punto Fijo, continued in 1997. A major effort to obtain reports of tag recaptured billfish continued in Venezuela during 1997. These results are including in the tagging section (below).

U.S. Virgin Islands. Shore-based sampling of billfish tournaments continued during 1997 (normally at least 4 tournaments are held each year). The western Atlantic coordinator did receive during 1997 sampling season catch and effort data from billfish tournament obtained from the Virgin Islands over the past several years.

Madeira, Portugal. The Western Atlantic Coordinator visited Madeira, Portugal, during the summer to assist other scientists (from Stanford University and Monterey Bay Aquarium) in a pilot study using popup satellite tags (funded by The Billfish Foundation) on blue marlin (see tagging below) and to make a presentation on tagging to the Secretaria Regional de Agricultura Florestas e Pescas.

#### OBJECTIVE 2 -- BILLFISH TAGGING PROGRAM

The Western Atlantic Coordinator continued to maintain communication with representatives of the Federation of Japan Tuna Fisheries Cooperative Associations relative to tagging of billfish from the Japanese longline fleet. However, the level of tagging activity will not be available until after the boats offload at Las Palmas later in the year. A total of over 70 tag recaptured billfish (as well as a few sharks) have been reported to the western Atlantic Coordinator through October, 1997. These recaptures represent both NMFS and The Billfish Foundation tags and continue to indicate increased tag recapture reporting rates as a result of the ICCAT Enhanced Research Program for Billfish. The Western Atlantic Coordinator collaborated in a pilot study with scientists from Stanford University and the Monterey Bay Aquarium (sponsored by The Billfish Foundation) using new popup satellite tag technology on blue marlin caught off Madeira, Portugal. Ms. Lidia Gouveia, ICCAT tag recovery coordinator for Portugal, assisted in this work. A total of 7 blue marlin were equipped with popup satellite tags as of October 1997. These tags are not scheduled to popup before the end of the year.

#### OBJECTIVE 3 -- AGE AND GROWTH

The 1997 sampling year was rather slow for the acquisition of calcified structures from very large and small billfish for our age and growth program. No samples over 1,000 pounds was obtained during 1997 but otoliths were obtained from several moderate size blue marlin. In addition, several juvenile billfish were also collected from the stomachs of larger predators.