ANALYSIS OF THE ICCAT ENHANCED RESEARCH SHORE-BASED PROGRAM IN GRENADA FROM 1988 TO 1992

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SUMMARY

A description and preliminary analysis of five years of shore-based sampling activities of billfish in Grenada. This paper discusses both the logistical and data processing aspects of the program, and explores prospects for its enhancement in the near future.

RESUME

Ceci est une description et une analyse préliminaire de cinq ans d'activités d'échantillonnage à terre d'istiophoridés à Grenade. Le présent document traite des aspects logistiques comme du traitement des données du programme, et recherche la façon de le développer dans un avenir proche.

RESUMEN

Descripción y análisis preliminar de cinco años de actividades de muestreo en tierra de marlines llevadas a cabo en Grenada. El documento trata los aspectos logísticos y de proceso de datos del programa y explora la posibilidad de su futura intensificación.

1. INTRODUCTION

Shore-based sampling of billfish for the ICCAT Enhanced Research Program for Billfish in Grenada was initiated in 1988 as a result of agreement reached between ICCAT and the Government of Grenada (Fisheries Division). ICCAT had determined that the quantity of billfish[2] landed by the artisanal longline fishery in Grenada merited that country's inclusion as a sampling point.

Initial training of samplers (fishery officers) was provided by the western Atlantic coordinator of the program. Officers thus trained were in turn responsible for the training and supervision of the data collectors at the landing points. At the start of the program, sampling was concentrated mainly at the town of Gouyave on the western coast of the island (Figure 1). This location was the landing point for the bulk of the artisanal longline fishery.

At the start sampling in 1988, five (5) different measures of length[3], as well as weight and sex were obtained. As the program progressed, ICCAT made adjustments to the required data and three (3) of the length measurements were dropped (EOFL, PDL, DFL), while one measurement was added (Pectoral Anal Length). In addition, the program expanded to include four (4) other landing points and data collection was also initiated to sample the local annual Spice Island Recreational Billfish Tournament (S.I.B.T.).

During the five year period of active data collection, close to two thousand (2000) billfish were sampled. This document summarizes;
(a) how the program was carried out,
(b) briefly discusses the results, and
(c) looks at the program enhancement in the near future.

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1 Fisheries Division, Ministry of Agriculture, Land, forestry and Fisheries, St. Georges, Grenada.

2 Istiophorus albicans, Makaira nigricans, Tetrapturus albidus

3 Lower Jaw Fork Length (LJFL), Eye Orbit Fork Length (EOFL), Pectoral Fork Length (PFL), Pectoral Second Dorsal Length (PDL), and Dorsal Fork Length (DFL).

2. METHODS

At the commencement of the sampling program, employees of the fish markets at Gouyave and Victoria[4] (Figure 1) who we felt would to be sufficiently competent were selected and trained in billfish species identification, length frequency measurements, sex determination and how to record data on ICCAT Billfish Shorebased Sampling Form B. Initially, length measurements were taken using tapelines of the sort normally used by tradesmen. In 1989, ICCAT supplied samplers with fiberglass measuring tapes.

The bulk of the data was collected during the "Ocean"[5] season. The data collectors operated under the direct supervision of the fisheries officer responsible for the program. The supervisor was responsible for ensuring that as many data as possible were obtained and that the data were quality-controlled and properly recorded. The responsibility of the supervisor extended to monitoring for tagged fish and very large or small specimens, scrutinizing the data and managing the incentive scheme that is part of the program. Dr. Eric Prince of the Southeast Fisheries Center (who also serves as western Atlantic coordinator of the program), Miami, Florida, was always available for advice and other assistance.

After all the data were collected and examined, the officer responsible then submitted an annual report to ICCAT in Madrid for inclusion in its "Collective Volume of Scientific Papers".

During the five years of research activity, there were three significant changes in sampling procedures during the period under review[6]; these were:

(a) the increase in the number of landing locations used as data collection points (Figure 1);

(b) the sampling of the catch landed during the annual 3-day Spice Island Recreational Billfish Tournament;

(c) the setting of targets for the minimum number of fish to be sampled during the season (as an incentive).

It is also important to note that during the five years of research activities, of the original six (6) length frequencies measured, only Lower Jaw Fork length (LJFL), Pectoral Fork Length (PFL), and Pectoral Anal Length (PAL) are extant. During the period of study, the financial incentive for both data collectors and supervisors was increased slightly.

3. RESULTS

The data presented in Tables 1-5 and Figures 2-13 refer only to length frequencies by sex for LJFL, PFL, and PAL. Tables 1-4 summarize the annual results of the program from 1988 to 1991[7], during which about 1700 billfish were sampled. Table 5 combines all data collected from 1988 through 1991, except for the recreational tournament data. Figures 2-5 present the size frequency data collected from the artisanal longline fishery for 1991, while Figures 6-10 summarize the size frequency data collected from the 1991 Spice Island Recreational Billfish Tournament. Figures 11-14 represent the most recent size frequency data collected during 1992.

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4 In Grenada, fish markets are also the landing sites for most of the fin fish fishery.

5 The "Ocean" season refers to that period when the artisanal surface longline and trolling fisheries target migrating pelagic species such as sailfish, yellowfin tuna (Thunnus albacares), blue marlin, and dolphin fish (Coryphaena hippurus). This period lasts from November of one year to June of the following year.

6 Non-corrosive fiberglass measuring tapes replaced metal ones starting in 1989.

7 Tables 1-5 do not include S.I.B.T. data. Table 5 summarizes data for Atlantic sailfish for 1988-1991.

4. DISCUSSION

Size frequency data have remained fairly consistent throughout the period[8]. One of the trends that has emerged with respect to LJFL data is that females tend to dominate the larger sizes fairly consistently throughout the study. As the program progressed from 1988 through 1992, samplers became more efficient in collecting data and thus the sample sizes increased dramatically, particularly in the last two years (Figures 2-5 and 11-14).

We have noted that the bulk of LJFL measurements for sailfish were consistently within the 161-180 cm range, for PFL the dominant range was 121-140 cm, and for PAL the dominant range was 61-70 cm.

For the upcoming 1992-93 season, there may be excellent opportunities to enhance the quantity and quality of the data collected. This is dependent on the level of fishing effort exerted by the eight Japanese longliners (10 m long). These are expected to change the pattern of longline fishing in Grenada and to have a significant impact on the resource.

What is of particular importance to the local ICCAT sampling program is the opportunity to conduct at-sea sampling. In addition, there is a high probability that the ICCAT research program in Grenada can be expanded to include the collection of oceanographic data, as well as a small sailfish tagging project between ICCAT and CARICOM, since one of the longliners mentioned above will be reserved for the exclusive use of the Fisheries Division.

8 previous SCRS reports from Grenada.

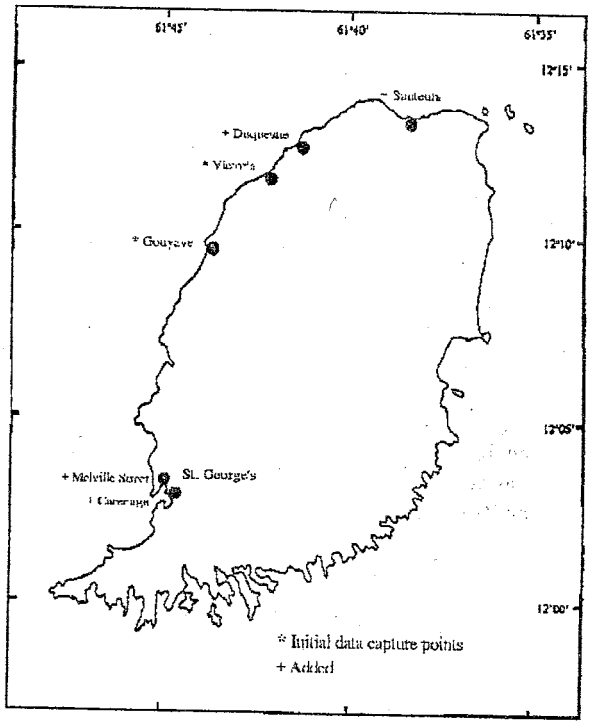

Figure 1 Map of Grenada, showing data collection points for ICCAT Enhanced Research Program shore-based billfish sampling, 1988-1992.

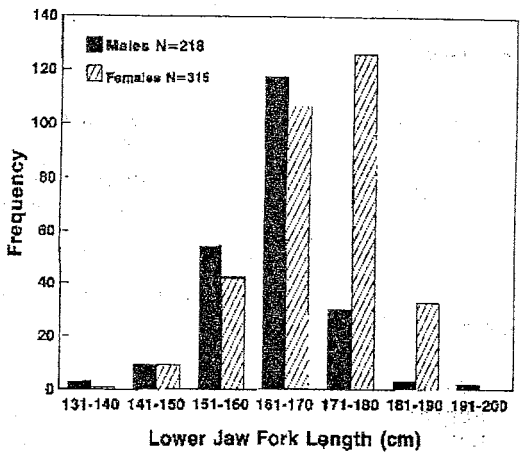

Figure 2 Size frequency (lower jaw fork length) of sailfish in 10 cm intervals landed in the artisanal fishery, Grenada, 1991. Males (N = 218) are solid bars and females (N = 315) are hatched bars.

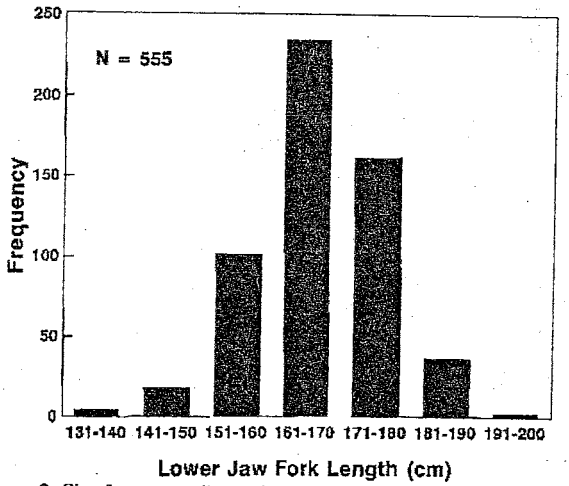

Figure 3 Size frequency (lower jaw fork length) of sailfish in 10 cm intervals landed in the artisanal fishery, Grenada, 1991. Total males and females (N = 555) are solid bars.

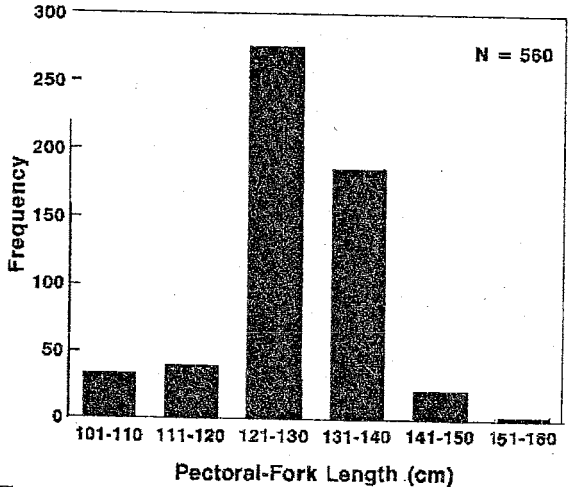

Figure 4 Size frequency (pectoral fork length) of sailfish in 10 cm intervals landed in the artisanal fishery, Grenada, 1991. Total males and females (N = 560) are solid bars.

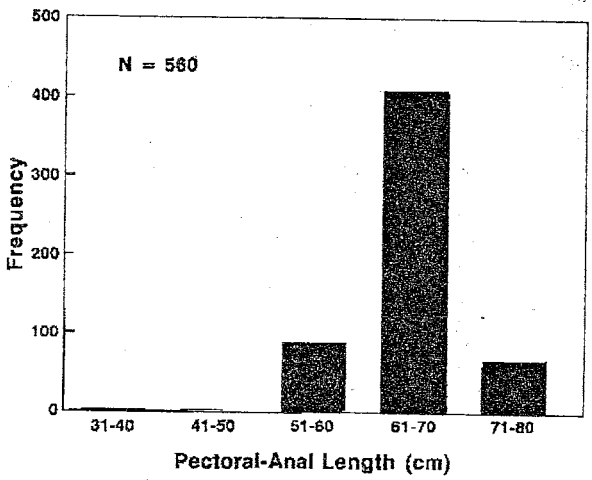

Figure 5 Size frequency (pectoral/anal length) of sailfish in 10 cm intervals landed in the artisanal fishery, Grenada, 1991. Total males and females (N = 560) are solid bars.

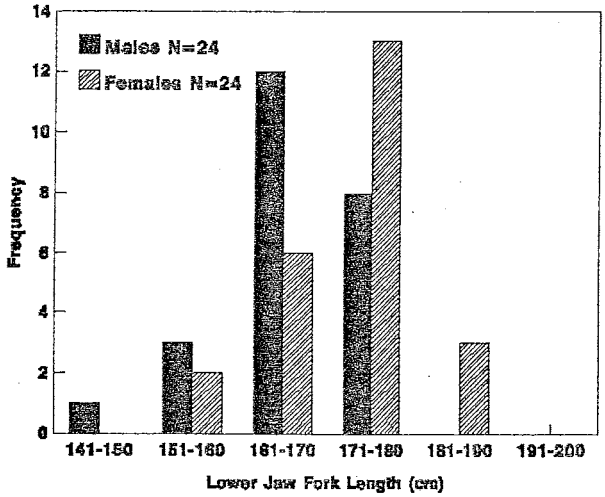

Figure 6 Size frequency (lower jaw fork length) of sailfish in 10 cm intervals landed in the Spice Island Billfish Tournament, Grenada, 1991. Females (N = 24) are hatched bars and males (N = 24) are solid bars.

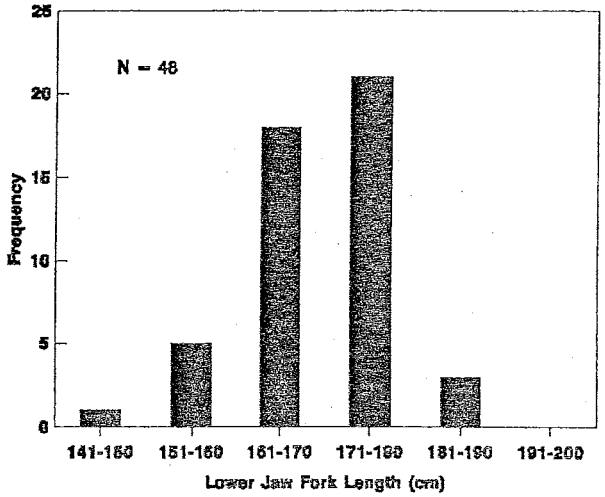

Figure 7 Size frequency (lower jaw fork length) of sailfish in 10 cm intervals landed in the Spice Island Billfish Tournament, Grenada, 1991. Total males and females (N = 48) are solid bars.

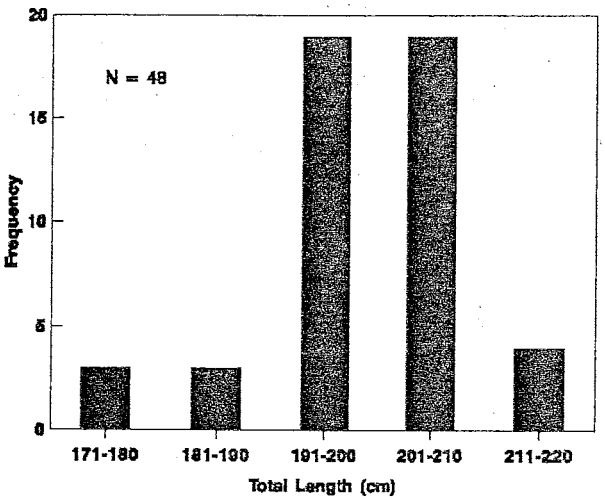

Figure 8 Size frequency (total length) of sailfish in 10 cm intervals landed in the Spice Island Billfish Tournament, Grenada, 1991. Total males and females (N = 48) are solid bars.

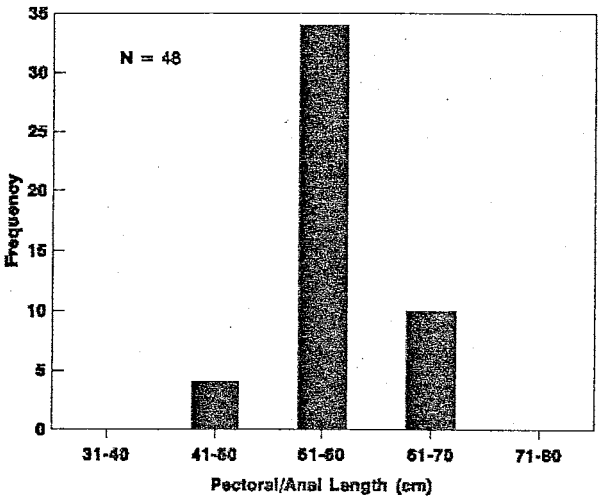

Figure 9 Size frequency (pectoral/anal length) of sailfish in 10 cm intervals landed in the Spice Island Billfish Tournament, Grenada, 1991. Total males and females (N = 48) are solid bars.

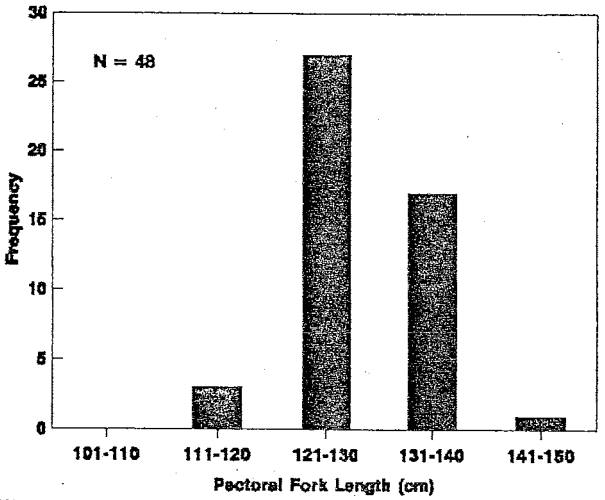

Figure 10 Size frequency (pectoral fork length) of sailfish in 10 cm intervals landed in the Spice Island Billfish Tournament, Grenada, 1991. Total males and females (N = 48) are solid bars.

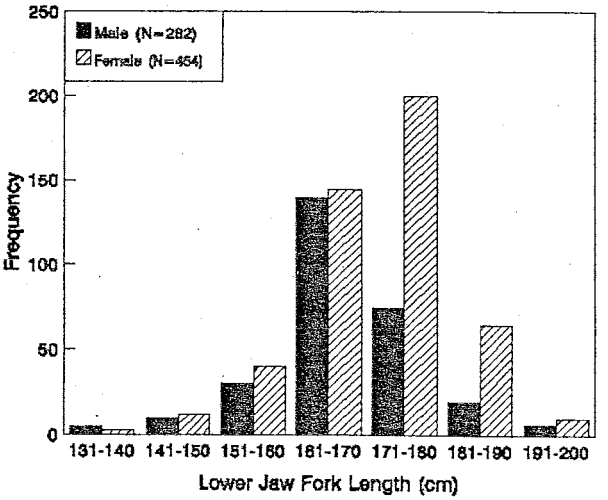

Figure 11 Size frequency (lower jaw fork length) of sailfish in 10 cm intervals landed in the artisanal fishery, Grenada, 1992. Males (N = 282) are solid bars and females (N = 454) are hatched bars.

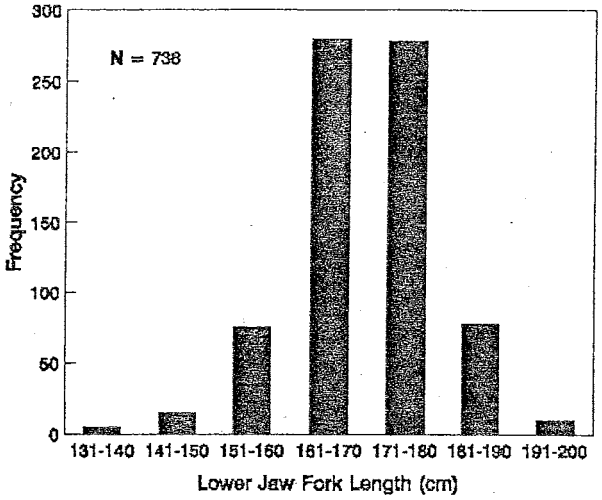

Figure 12 Size frequency (lower jaw fork length) of sailfish in 10 cm intervals landed in the artisanal fishery, Grenada, 1992. Total males and females (N = 736) are solid bars.

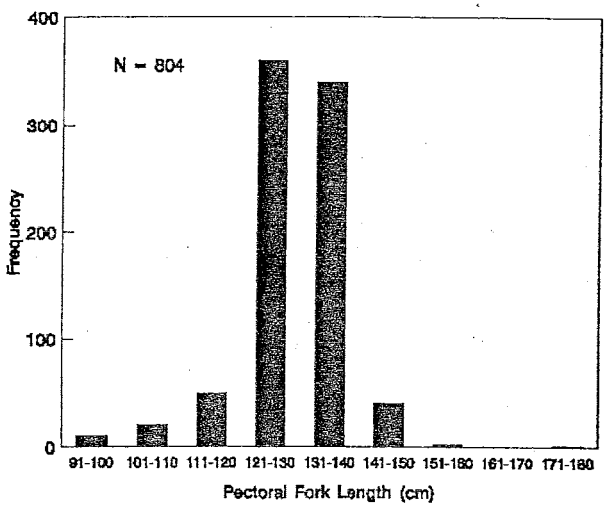

Figure 13 Size frequency (pectoral fork length) of sailfish in 10 cm intervals landed in the artisanal fishery, Grenada, 1992. Total males and females (N = 804) are solid bars.

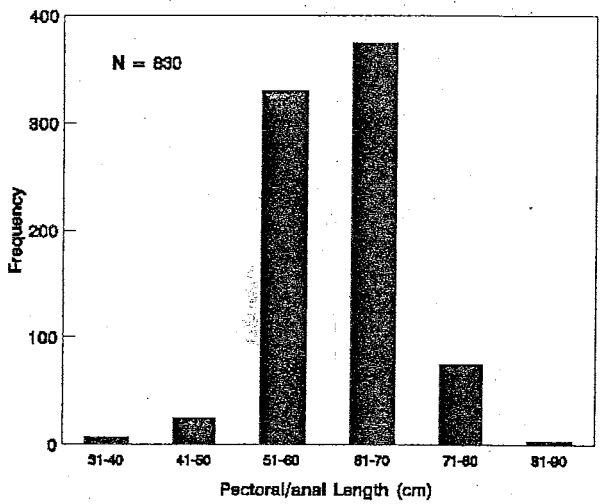

Figure 14 Size frequency (pectoral/anal length) of sailfish in 10 cm intervals landed in the artisanal fishery, Grenada, 1992. Total males and females (N = 830) are solid bars.