

HISTORICAL CPUE OF THE RECREATIONAL FISHERY FOR BILLFISH IN THE U.S. VIRGIN ISLANDS : ST. CROIX

Adams, A.

*Government of the U.S. Virgin Islands, Dept. of Planning and Natural Resources, Div. of Fish and Wildlife,
Room 203, Lagoon Street Complex, Frederiksted, St. Croix 00840, U.S. Virgin Islands*

SUMMARY

Previous reports on the recreational billfish fishery of the U.S Virgin Islands have utilized data from St. Thomas, where there is a well documented recreational billfish fishery. The entry of historical (1982 - 1992) recreational fishing interview data from St. Croix into a computer database provided an opportunity for analyses of an additional aspect of the U. S. Virgin Islands recreational billfish fishery.

A total of 2,393 interviews were entered in a computer database, representing 14,095 boat hours, and recording a total of 138 billfish caught. CPUE was highest for blue marlin in June through August, and in January. CPUE of blue marlin was higher in 1993-1995 than for any previous year. CPUE values for blue marlin were lower than St. Thomas but similar to the U.S. Atlantic and Gulf of Mexico. CPUE for white marlin was highest in May and June, and for sailfish in March. The percentage of billfish released increased from zero in 1982 to 100% by 1993. The revision of the recreational fisheries sampling program will provide statistically valid data for better inter-island comparisons in the future.

RESUMÉ

Les rapports antérieurs sur la pêche sportive d'istiophoridés aux Iles Vierges (USA) utilisaient les données de St. Thomas, où il existe une pêche sportive d'istiophoridés bien documentée. L'incorporation des données historiques (1982-92) provenant d'enquêtes menées à St. Croix dans une base de données informatique a permis d'analyser un autre aspect de la pêche sportive d'istiophoridés aux Iles Vierges.

En tout, 2.393 enquêtes ont été incorporées à la base informatisée, soit 14.095 heures/bateau, et un total de 138 istiophoridés capturés. La CPUE du makaire bleu était plus élevée de juin à août, et pendant le mois de janvier. Elle était plus forte en 1993-95 que pour les années précédentes. Les valeurs de CPUE du makaire bleu étaient plus faibles qu'à St. Thomas, mais semblables à celles des secteurs atlantiques et du Golfe du Mexique des Etats-Unis. La CPUE du makaire blanc était plus forte en mai et juin, et celle du voilier au mois de mars. Le pourcentage d'istiophoridés remis à l'eau s'est accru de 0 en 1982 à 100 % en 1993. La révision du programme d'échantillonnage de la pêche sportive donnera des données valides du point de vue statistique pour une meilleure comparaison entre les îles à l'avenir.

RESUMEN

Informes previos sobre la pesquería deportiva de marlines de las Islas Vírgenes (EE.UU.) han utilizado datos de St. Thomas, donde hay una bien documentada pesquería recreativa de marlines. La entrada de datos históricos (1982-1992) de entrevistas de pesca deportiva de St. Croix en una base de datos informática ofreció la oportunidad para el análisis de un aspecto adicional de la pesquería deportiva de marlines de las Islas Vírgenes (EE.UU.).

Se introdujo un total de 2.393 entrevistas en una base de datos informática, que representaban 14.095 horas a bordo, y registraban un total de 138 marlines capturados. La CPUE de aguja azul fue la más alta en junio hasta agosto y en enero. La CPUE de aguja azul fue más alta en 1993 - 1995 que en cualquier otro año anterior. Los valores de CPUE de aguja azul fueron inferiores que en St. Thomas, pero similares a los de la zona atlántica de Estados Unidos y Golfo de México. La más alta CPUE de aguja blanca fue en mayo y junio, y de pez vela en marzo. El porcentaje de marlines liberados se incrementó desde cero en 1982 a 100% en 1993. El examen del programa de muestreo de pesquerías deportivas aportará datos estadísticamente válidos para una mejor comparación entre islas en el futuro.

INTRODUCTION

The U. S. Virgin Islands has a reputation as an excellent recreational billfish fishery. There have been numerous reports on the recreational billfish fishery in the U. S. Virgin Islands, but these reports have relied upon data from St. Thomas (Friedlander, 1995; Friedlander and Contillo, 1994). Other reports have examined the recreational billfish fishery in the United States Atlantic Ocean (Fisher and Ditton, 1992) and on other islands in the Caribbean (Harvey et al., 1990; Ditton and Clark, 1994). Although a port sampling program has been in effect on St. Croix, U. S. Virgin Islands, since the early 1980's, the data from this program had not been analyzed prior to this report. This paper provides an overview of the recreational billfish fishery interview data for St. Croix from 1982 to September 1995, and a comparison to data reported for St. Thomas.

The majority of effort in the billfish fishery of the U. S. Virgin Islands occurs on St. Thomas, where the current fishery began in the 1950's (Erdman, 1968). Much of the fishing activity occurs on the North Drop, in British Virgin Island waters, although some effort is also expended on the South Drop, in U. S. Virgin Islands waters (Friedlander, 1995). The majority of the activity at these two sites is in pursuit of billfish, primarily blue marlin, *Makaira nigricans*. Although there is effort expended for billfish throughout the year, the majority of effort occurs from June through October (Olsen and Wood, 1983; author, per. obs.). Much of this effort occurs during billfish tournaments, again primarily on St. Thomas where there are four billfish tournaments each year between June and September. In contrast, St. Croix currently has only one billfish tournament (St. Croix Golden Hook Challenge Billfish Tournament) which takes place in October.

The offshore recreational fishery on St. Croix is a great deal smaller than on St. Thomas, and there is less effort focused specifically on billfish. The St. Croix fishery is composed of less than 30 boats, the majority of which are docked on the north side of St. Croix. Most of the effort occurs to the north and east of the island. All ports on St. Croix are located within minutes of pelagic habitat, and the fishing effort is spread over a large area. Common practice is to begin trolling upon reaching suitable deep water. For this reason, wahoo, *Acanthocybium solanderi*, dolphin, *Coryphaena hippurus*, king mackerel, *Scomberomorus cavalla*, and yellowfin tuna, *Thunnus albacares* are in high abundance in reported catches.

METHODS

The Division of Fish and Wildlife (Division) developed a recreational fisheries port sampling program in 1983 to collect data on recreational fishing activities in the U. S. Virgin Islands (Brandon, 1988). This effort included dockside sampling of non-tournament fishing, as well as collection of tournament data. On St. Thomas, this data collection effort was greatest during the summer months when offshore fishing effort was highest (Friedlander, 1995). In addition, the majority of the sampling effort was focused on the east end of St. Thomas where the majority of offshore boats are docked.

On St. Croix, anglers were interviewed at dockside, by phone, or through a log book program. The sampling effort was spread among the various docking facilities, primarily on the north side of the island. In addition, Division personnel acted as weighmasters at tournaments, thus ensuring complete tournament data collection.

In 1993, the Division revised the recreational fisheries sampling protocol to better fulfill the purpose of the Division as a fisheries management agency. The previous sampling program (Friedlander, 1995) focused attention on the offshore large boat fishery, especially on St. Thomas. However, a significant number of individuals of the U. S. Virgin Islands recreational fishing community do not participate in the offshore fishery. Therefore, the sampling protocol was changed to a randomized design (by landing port, time period, and day of week) with sampling focused on shoreline fishing areas, boat launching or boat mooring areas, as well as larger marina areas. Larger marinas were the primary

focus of previous sampling for offshore fisheries data. This sampling strategy will allow the Division to accurately assess the entire recreational fishery of the U. S. Virgin Islands rather than a single component. It is important to note that the offshore fishery will continue to be sampled in a manner which will be consistent with previous years and result in excellent data on the offshore fishery. Furthermore, the standardized random sampling design will provide results which are more statistically rigorous, and allow for better inter-island comparisons. Finally, the Division will continue to act as weighmasters at all tournaments on St. Croix, at limited tournaments on St. Thomas, and will continue to have complete access to all tournament records where the Division does not act as weighmaster.

The recreational fishing interviews were sorted by type (offshore vs reef fisheries) and the offshore interviews were entered into the Division computer recreational fisheries database. The data was then summarized by species (blue marlin, white marlin, *Tetrapturus albidus*, and sailfish, *Istiophorus platypterus*), year and month. Effort was defined as boat hours. The number of rods fishing per boat was four in more than 98 percent of the trips, therefore number of rods was not considered in calculations of effort. Catch per unit effort (CPUE) was calculated as the number of fish caught per boat hour. All interviews recorded gear type as rod and reel. No differentiation was made between fishing methods (trolling vs. drifting) or bait type (artificial, dead natural, or live). Recreational fisheries interview data for 1993 - 1995 were pooled to provide for comparison to the historical data.

RESULTS AND DISCUSSION

The smaller size of the St. Croix offshore recreational fishing fleet, and the lower billfish-specific effort, compared to St. Thomas is reflected in the 1982 - 1992 data. On St. Croix, a total of 2,393 interviews were conducted for the period 1982 - 1992. Total boat hours for the period was 14,095, with a total of 138 billfish caught. Mean hours per trip varied from 3.8 to 7.2. CPUE varied from zero to 0.011 fish per boat hour (Tables 1 and 2). Overall CPUE for the period for all billfish combined was 0.01, which is similar to an 18 year average for the U. S. Atlantic and Gulf of Mexico waters (NMFS, 1989). On St. Thomas, there was a total of 8,641 interviews covering 69,398 boat hours for the period 1983 - 1989. A total of 5,729 blue marlin were reported caught for an overall CPUE of 0.083 (Friedlander, 1990). Friedlander reports data for blue marlin only.

In addition to differences in fleet size and species-specific effort, a partial explanation for differences between St. Thomas and St. Croix is the mode of fishing. On St. Croix, for the 1982 - 1992 period, 12.1% of the interviews were from tournaments, while 4.5% of the interviews were from tournaments for 1993 - 1995. Friedlander (1995) did not report the percentage of interviews for the 1983 - 1989 period, but for the 1993 - 1995 period 70% of all interviews with offshore recreational anglers on St. Thomas were from tournaments. Tournaments are held during the peak billfish, primarily blue marlin, season and may provide a biased estimate of annual CPUE.

Although fishing effort generally increased since 1982, there is no pattern of change in overall CPUE. There was an apparent increase in fishing effort on St. Croix from 1982 to 1988, but this was interrupted by Hurricane Hugo in September 1989 (Table 2). In 1989 there were 283 interviews for a partial year. The increase in fishing effort resumed from 1990, with 107 interviews, and continued through 1995 (approximately 800 interviews). The blue marlin CPUE for 1993 - 1995 (0.012) is the highest over the 14 year period, and may indicate an increase in billfish-specific effort on St. Croix.

The seasonality of catches for billfish showed distinct patterns for each species, which were only partly similar to findings for St. Thomas (Friedlander, 1995). Blue marlin CPUE on St. Croix was highest in June - August, and again in January at approximately 0.01 (Table 1). For St. Thomas, Friedlander (1995) reported highest CPUE in June through October. It is possible that large differences in effort by month on St. Thomas may have biased the estimates. In general, St. Croix does not host many seasonal billfish anglers, as occurs on St. Thomas (Friedlander, 1995), and differences in effort by month are much smaller. White marlin catches on St. Croix were primarily limited to February through June, with highest CPUE in May and June. St. Croix sailfish catches were low, overall, but peaked in March.

The percentage of released billfish has increased since 1982. The interviews from 1982 - 1992 occasionally omitted the result of the catch (i.e., landed versus released), and did not differentiate between released and tagged fishes (Table 3). However, the overall trend shows an increase from zero to 100% release for all three billfish species. Data from the revised sample program (1993 - 1995) show that 100% of billfish are reported released, and approximately 95% of those are tagged. These results are similar to those reported for St. Thomas (Friedlander, 1995) and the U. S. Atlantic (Fisher and Ditton, 1992).

The average weights of each species have fluctuated over time. There has been no change in average weight associated with the increase in percentage of released fish. There is no definitive trend in average weight for any species. These results are similar to those reported for St. Thomas (Friedlander, 1990).

CONCLUSIONS

Although under-exploited, St. Croix has a small offshore recreational fishery with billfish CPUE values similar to those reported for the U. S. Atlantic and Gulf of Mexico. This fishery was increasing in size and effort prior to Hurricane Hugo in September 1989, and resumed this increase in the early 1990's. The increase in blue marlin CPUE by 1995 and the new annual marlin tournament suggest a continuation of the recreational billfish fishery for St. Croix. This fishery will likely continue to progress as a tag and release fishery.

The newly revised recreational fisheries sampling program will provide statistically valid information on all aspects of the U. S. Virgin Islands recreational fisheries. This will not be at the expense of data from the offshore fishery. Rather, the data will be comparable between islands for the first time due to the standardized sampling design. In addition, the randomized

sample design should remove some of the bias associated with seasonal changes in effort and reliance on tournament data. Hopefully, this sample design will also remove the problems associated with anglers reporting in only when they catch, and thus artificially increasing the CPUE.

With the damage to all three U. S. Virgin Islands from Hurricane Marilyn in September 1995, the recreational fishing industry will be depressed for an unknown period. However, as shown by data in this report the fishing fleet does return.

Future work should provide better comparisons between St. Thomas and St. Croix as databases are examined and standardized. Also, there are additional interviews for St. Thomas which have not yet been sorted for reliable data. Finally, more detailed analyses of the post-1993 data will provide a better picture of the billfish fishery for the entire U. S. Virgin Islands.

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- comparisons in the future.