NOAA Technical Memorandum
NMFS-SEFSC-304

Shallow Water Reef Fish Stock Assessment for the U.S. Caribbean

Report from a Workshop Held in San Juan, Puerto Rico, November 18-20, 1991

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Cover Photo: Paradise lost? A spearfisherman with reef fish catch at Water Island, St. Thomas Harbor, St. Thomas, U.S.V.I. (Modified from a photo published in the February 1956 National Geographic Magazine, p. 221, titled "Spearfisherman lands a rainbow catch at Water Rock in St. Thomas Harbor.") Fishes displayed include two large Nassau grouper, a large unidentified grouper, a mutton snapper, a large rock hind (on spear), a princess parrotfish, two unidentified parrotfishes, a triggerfish, a rock beauty, queen angelfish, blue runner and an unidentified fish.

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EXECUTIVE SUMMARY

A stock assessment workshop examined fishery trends for shallow water reef fishes in the U.S. Caribbean based on available fishery landings and biostatistical data. Puerto Rico, St. Croix, and the combined St. Thomas/St. John areas were chosen as appropriate geographical units for analysis. The workshop focused on comparing 1985 with 1990 because the data for these years were nearly complete. Trends in catch-per-unit effort were examined using data from other years when sufficient data were available. Deep water reef fishes, although technically not included in the Shallow-Water Reef Fish Fishery Management Plan, were also examined because of their importance to the reef fish fishery.

Significant improvements were noted in data collection, management, and coverage since 1987, particularly in Puerto Rico. Continued improvements are possible and were encouraged.

Insufficient data were available to calculate spawning potential ratios to measure overfishing, although there was reasonable direct and anecdotal evidence to suggest that many species continue to be overexploited.

Overall, using these indices,the reef fish fishery in Puerto Rico has declined from previous levels. In 1931, 1403 fishermen using 711 vessels (only 9 with motors) landed 3,080,100 lbs (Jarvis, 1932). In 1989, 1822 fishermen with 1107 vessels landed 2,305,004 lbs (Matos and Sadovy, 1990). Over the past 16 years landings have averaged 3.15 million pounds, but after reaching a high of 5.36 million lbs in 1979, they declined to a low of 1.67 million lbs in 1988 and then only slightly increased in 1989 and 1990. Composition of snapper have shifted from mostly shallow water to deeper water species and several families comprise a smaller proportion of the total demersal catch.

A similar long term database was not available from the USVI although total projected finfish landings appeared reasonably stable between 1975 and 1989, averaging 0.93 million pounds for St. Thomas/St. John and 0.44 million pounds for St. Croix.

Catch per unit effort based on fish traps has declined in both the USVI and Puerto Rico. Landings of larger individuals of groupers such as coney and red hind have decreased; and Nassau grouper in particular continue to be very scarce.

Biostatistical data were used to examine size-frequency trends by area and gear type. Growth overfishing appears to be a major problem based on the large number of small fishes being landed and the recent declines in total landings. A yield-per-recruit analysis would help quantify this situation, however, the review team was unable to conduct an analysis because of the lack of essential biological data specifically tuned to Puerto Rico and the USVI.

Although simple evaluations were made to note changes in mean capture length over time, too few data existed to

interpret the causes of changes for most species. Recruitment variability was shown for red hind and coney in Puerto Rico and St. Croix. Relatively poor recruitment for red hind in recent years in both the USVI and Puerto Rico should be a particular source of management concern although whether this variability was due to natural events or as the result of fishery exploitation cannot be determined from available data. Fishing appears to be the cause for the recent decline of large coney in St. Croix because recruitment appears consistent. The workshop showed that long-term data sets are necessary for analyses to determine recruitment effects and allow proper interpretation. Recruitment variation and the effect of this variation on length-frequency distribution indicate that pair-wise comparisons of annual length-frequency distributions may give misleading results.

Recommendations were made concerning management and methodological issues. The most noteworthy management recommendation was to improve compliance and secure compatible regulations between the Caribbean Fishery Management Council and the Commonwealth and Territorial governments. Without compatible regulations and cooperation to increase compliance, particularly by the Commonwealth of Puerto Rico, no improvements for the fishery can be anticipated because so little reef habitat is under direct Council control.

The most obvious management recommendation was to reduce fishing effort, particularly on small fishes, in order to increase the productivity of the reef fish fishery. Increasing the minimum mesh size of fish traps to at least 2" would be a step in the right direction but probably will not be sufficient to obtain significant increases in yield, especially for species that are being recruitment overfished. Establishment of no harvest zones and protection of known spawning aggregations were recommended as a means to improve the spawning stock size. It was also recommended that deeper water reef fishes be included in the Fishery Management Plan.

Methodological recommendations include continued efforts to standardize and improve data collection, entry, and storage. Historical length-frequency and catch-per-unit-effort data should continue to be entered into the database. Local studies are needed on reef fish growth and fecundity to produce yield-per-recruit models and calculate spawning potential ratios. Better information on where and how fish are captured would be extremely helpful for future analyses.

INTRODUCTION

The Caribbean Fishery Management Council's (CFMC) Fishery Management Plan (FMP) for the Shallow-Water Reef Fish (SWRF) Fishery of Puerto Rico and the U.S. Virgin Islands in the Exclusive Economic Zone (EEZ) of the U.S. Caribbean became effective on September 22, 1985. The FMP identified a number of activities that require the attention of the National Marine Fisheries Service (NMFS) and the Caribbean Fishery Management Council (CFMC), in cooperation with the Commonwealth of Puerto Rico, and the Territory of the U.S. Virgin Islands (USVI) through their pertinent agencies: Puerto Rico Department of Natural Resources (PRDNR) and the Fisheries Research Laboratory, and the USVI Department of Planning and Natural Resources, Division of Fish and Wildlife.

The management unit includes 64 of the most commonly landed species (14 families) that compose the reef fish catch from PR and the USVI. The FMP established regulations to rebuild declining reef fish stocks in the fishery and reduce conflicts among fishermen. It established criteria for the construction of fish traps; required owner identification and marking of gear and boats; prohibited the hauling of or tampering with another person's traps without the owner's written consent; prohibited the use of poisons, drugs, other chemicals, and explosives for the taking of reef fish; established a minimum size limit on the harvest of yellowtail snapper and Nassau grouper; and established a closed season for the taking of Nassau grouper.

Amendment 1, May 1990, established an area closure during the red hind spawning season in the EEZ southwest of St. Thomas; included a provision for the collection of socio-economic data; and modified two management measures: (1) increase the minimum mesh size requirement for fish traps to 2 inches by September 1991, and (2) prohibit the harvest of Nassau grouper. In September, 1991, provisions were approved that (1) defined overfishing at 20% of the spawning stock biomass per recruit that would occur in the absence of fishing; (2) delayed the 2 inch mesh requirement until September 14, 1993; (3) allowed the use of 1.5 inch square mesh wire until September 14, 1993; and (4) made specific requirements for fish traps that included two required degradable escape panels on opposite sides of fish traps attached by 1/8 inch diameter, untreated, jute twine.

To meet FMP requirements for continual monitoring and subsequent action as data become available, a SWRF stock assessment workshop was conducted at the CFMC offices in San Juan, Puerto Rico on November 18-20, 1991. This is the resulting report for the SWRF resource in the U.S. Caribbean.

METHODS

This workshop focused on comparing data from fiscal year 1985 (October 1984 through September 1985), the baseline year, with calendar year 1990 (January through December 1990) because data from other years were incomplete, or had not been computerized and edited in time for this report. Trends in CPUE were

examined for other years when sufficient data were available. Species considered "deep water" reef fish, although not part of the Shallow-water Reef Fish FMP, were examined as part of this assessment because some evidence indicates that the reef fish fishery has shifted to deeper water species over recent years.

In preparation for the assessment, data from approximately 450 St. Croix trip interviews gathered from 1985 through 1990 were assembled by the CFMC staff and submitted to Miami Laboratory NMFS for data entry in the Trip Interview Program (TIP) format. Many historical landings and biostatistical data were entered from raw data sheets by CFMC and NMFS staff as part of a data archaeology project administered by the SEFSC, NMFS. Biostatistical data representing over 52,000 measured fish were pooled for length-frequency analysis. Participants examined data and conducted analyses where appropriate. The 1985 Caribbean Analysis (Bohnsack et al., 1986) was used as a database and a baseline for this report. The assessment team chose to use Puerto Rico, St. Croix, and the combined St. Thomas and St. John area as appropriate units for analysis. St. Croix was separated from the other Virgin Islands because it is located on a separate geological platform. The assessment team also agreed that a minimum of thirty observations for a given species or gear type were necessary in order for the data to be included in statistical analyses for this report. Tables 4-7 report all available data.

Fish traps and fish pots are considered synonymous for this report.

Biostatistical Data

The biostatistical data were made available in various forms from each island: data base files (DBF) files from Puerto Rico, LOTUS files from St. Thomas/St. John, and raw data sheets from St. Croix. Once the St. Croix data were edited and entered into the NMFS Trip Interview Program (TIP), all files (DBF, LOTUS and TIP) were converted to ASCII and then downloaded onto the VAX computer at NMFS/SEFC in order to undergo statistical analyses. Because each island has its own database format with unique requirements and species codes, data could not be rapidly coalesced into a single database. The 1985 Caribbean data were uploaded from the mainframe and converted into ASCII to have all data available.

Biostatistical analyses concentrated on the 64 species listed in the 1985 shallow-water reef fish fishery management plan. Also included in this report are 33 other categories which included congeneric species, species grouped by family (e.g. Lutjanidae), and fishery market classifications (e.g., first class fishes, second class, etc.). All data were sorted and analyzed separately by island, with metric conversions being performed as necessary to create uniform measurements. At times the analysis of species by weight or length was impossible due to the lumping of species into categories, especially in the 1985 data. Gear comparisons were also sometimes difficult because of the different gear type used over time. The 1985 data were previously formatted with 4 gear types. Gear types in the 1990 database were expanded to 10 types, but for the

purpose of this report were consolidated to 7 with "all other" including troll lines, skin diving and other unclassified gear.

Catch per unit effort (CPUE) Analysis

The CFMC provided CPUE by year calculated in terms of average landings per trip and average weight per species per trip where sufficient data were available (Appendix B). The use of CPUE as an indicator parameter for this report was complicated by several factors, including an insufficient number of samples for certain years and combined catches representing several fishing gears. Catch per unit effort estimates are influenced by the type of fishery, the area fished, and on the activity patterns of the fishermen. Fisherman in the U.S. Caribbean commonly troll for pelagic fishes while moving towards the area where fish pots have been set. After pulling traps, fishermen troll again to lobster or conch fishing sites, fish for these organisms, and then continue trolling to the landing site. Often these catches are combined in the data, regardless of the gear used to catch specific species. The fishermen of Puerto Rico participate in a voluntary trip ticket reporting system, in which the fishermen record their catch and effort information on a trip ticket which is collected by a port agent. To be effective, this system depends on the memory of the fisherman to accurately record their catches in a timely manner. Interpreting the trip ticket data however was sometimes difficult because several trips were, at times, summarized on one trip ticket. Occasionally only one gear type was recorded for the many species landed, even when it was known that the identified gear could not harvest the species indicated (e.g., conch harvested with bottom lines). Generally, however, the number of these questionable records was small. To compensate for these factors, we analyzed only those Puerto Rico trip tickets which identified one trip per ticket. The data are presented as pounds per trip for a given gear by species (Appendix B). Puerto Rico biostatistical data that did not indicate if the data represented a complete or partial harvest were not used in CPUE calculations.

The St. Croix biostatistical data represented complete landings and thus could be used as an indicator of CPUE. The data are presented as the average weight in grams for each species by trip. Only those samples which contained at least three years of data with thirty or more observations per year were included in this analysis. The St. Croix data are preliminary, however, as additional raw data were discovered after the analysis was completed and could not be included in this report. The additional data are not expected to significantly change the trends established within this report. No detailed St. Thomas or St. John landings data were available for CPUE analysis.

RESULTS AND DISCUSSION

Data Collection, Entry, and Management

Available Data

Results of this workshop emphasize the continued need for standardized data collection, entry, and storage. In a review of 1985 Caribbean data (Bohnsack, et al.,

1986), recommendations were made for improved data collection and management. Since then, significant improvements have occurred in terms of collection procedures, data management, and degree of coverage, especially for data from Puerto Rico. Still several problems were noted with much of the historical data that limited the types of possible analyses. One problem was the definition and classification of some reef fishes; species listed in the FMP were not necessarily the same species cataloged in landings reporting categories. Some reef fish classifications have changed which makes interpreting historical data problematic (e.g. primary reef fish). Deeper water reef fish were not recognized in the FMP but are routinely reported in recent landings data, especially among snapper. Terms and definitions used in the reef fish plan should be standardized as much as possible.

The variability of computer formats used from island to island was a problem. Each island had their own database format, including their own codes and programs, which made merging all data difficult, if not impossible. Statistical analyses were therefore restricted and some comparisons between islands and years were impossible.

Participants of the workshop recommended standardization of data collection and data bases, particularly for future data collection efforts. The present NMFS TIP program may provide a suitable format. In preparation for this workshop considerable effort was directed at entering historical data on an ad hoc basis. Still, some data exist that has been collected but have never been entered into a database. A need was recognized for formal standardization of data entry, editing, and routine data management. The workshop recommends that the SWRF management plan include reef fish caught routinely in deeper water such as Lutjanus buccanella, L. vivanus, Etelis oculatus, and Rhomboplites aurorubens.

Statistical Bias

The Puerto Rico biostatistical data were the most randomly collected. Port samplers routinely went out to ports and sampled catches as they were offloaded from boats. Some statistical bias probably existed in that fishermen who cooperated were approached more frequently than those who did not. Also, it is probable that some bias existed in some interviews by interviewers preferentially sampling larger and more unusual fish. The USVI biostatistical data is very biased, but precise, in that all data from St. Thomas/ St. John were collected from one trap fisherman. In addition, all St. Croix data were collected from one fish house, usually from the same fish pot fisherman, although on rare occasion the fish house would buy from other trap fishermen. Some snappers reported from St. Croix (e.g., Etelis oculatus, Apsilis dentatus, Lutjanus vivanus) were obviously not caught in fish traps and were actually a result of particular deep water reef fish sampling as these species are caught by vertical set lines. It is extremely important to note that the St. Croix trap fisherman who supplied nearly all biostatistical data began altering his traps from 1 1/2" to 2" mesh in 1987, completing the conversion in 1988.

Therefore shifts to larger fish indicated by the 1985-1990 St. Croix length-frequency comparison are most probably a result of mesh change rather than an increase in fish length at capture.

Puerto Rico Fishery Trends

Total Landings

In Puerto Rico total annual SWRF landings averaged 3.15 million pounds over 16 years, but have declined greatly since 1979 (Table 1, Figure 1). Total reported annual landings increased to a high of 5.36 million lbs in 1979, and then declined to a low of 1.67 million lbs in 1988. Landings in 1989 and 1990 increased slightly but were, only 36% and 35% respectively of the maximum reported landings in 1979 and well below the 16 year average. Despite uncertainty about the accuracy of calculated values for some years (see Matos and Sadovy, 1990a), the review team concluded that the data probably reflected general landings trends.

Two trends were noted in catch composition: (1) snapper (Lutjanidae) have shifted from mostly shallow water species to increased importance of deep water snapper (Table 2); (2) several families comprise a declining proportion of the total demersal catch: grunt (Haemulidae) declined from a maximum of 28% in 1977 to 8% of the catch in 1989; grouper (Serranidae) have declined from 19% in 1972 to 13% in 1989 while snapper (Lutjanidae) increased from 23% in 1974 to a high of 51% in 1989 (Appeldoorn and Meyers, in press, Table 2).

Fishing Effort

A workshop consensus was that fishing effort has probably increased slowly in Puerto Rico over recent years. Although some data are available on the total number of fishermen (Table 1), effort data specifically targeting reef fish by gear were generally unavailable although a shift in appears to have occurred in gear from fish traps to nets.

Direct comparisons of specific fishery gears is difficult to ascertain because of different gear classifications used. In 1985 total landings (n = 2,518,687 lbs) were accounted for by fish traps (53%), hook and line (31%), other traps and hooks (5%), and other gears (11%). Fish traps remained the major fishing gear accounting for 40% of total landings in 1990 (down from 53% in 1985). In 1990, traps were followed by bottom lines (26%), gill nets (14%), SCUBA (6%), beach seines (3%), longlines (2%), and other gears (10%) in terms of contribution to total landings (n = 1,520,596 lbs).

Matos (in review) compared fishes landed from fish traps, gill nets, and trammel nets and showed that fish traps tended to catch smaller fishes.

Catch-per-unit effort (CPUE)

The reported CPUE of reef fishes landed by fish traps in PR reached a maximum of around 325 lbs/trap-yr in 1978 and then declined to approximately 45 lbs/trap-yr in 1989 (Figure 1c). Appeldoorn and Meyers (in press) analyzed fisheries independent data and showed higher

CPUE with distance from shore. Presumably greater fishing effort closer to shore reduces stock size and CPUE.

Although CPUE is an important parameter used to indicate the condition of a fishery, our ability to use CPUE was limited for a variety of reasons. One problem was the fact that most reef fish were caught by a variety of techniques (Matos and Sadovy, 1990a). Other problems, as discussed before, were our inability to distinguish one trip from many in the voluntary trip ticket system, the inability to distinguish a total from a partial catch in several years, the pooling together of species, the absence of effort data, and insufficient data for certain years. Only 14 species had sufficient data (as described in the introduction) to calculate CPUE by gear type. Simple linear trend lines were fit to the data and plotted courtesy of the CFMC (Appendix B). Trends are described in Table 3, although too few years of data were available to test statistical significance of the trends. It is readily apparent that a longer time series of data is necessary to make meaningful conclusions. For the last few years the intensity of sampling in Puerto Rico has increased, but these data cannot be used to look at trends in this assessment as they either span only two years or do not have sufficient (more than 30) observations per species with a given gear.

U.S. Virgin Islands Fishery Trends

Total Landings

Total projected finfish landings in the USVI appeared reasonably stable, averaging 1.35 million lbs between 1975 and 1989 (0.93 for St. Thomas/St. John, and 0.44 for St. Croix; Figure 1, Table 1). Total annual landings were higher from St. Thomas/St. John than from St. Croix presumably because of fewer fishermen and a smaller island platform around St. Croix.

Fishing Effort and Catch-per-unit effort (CPUE)

The workshop consensus was that fishing effort had probably increased slowly in the Virgin Islands over recent years. Although some data were available on the total number of fishermen (Table 1), effort data specifically targeting reef fish by gear were generally unavailable. However, based on 1985 data, fish pots accounted for 73% of the recorded weight landed in St. Thomas/St. John, and 71% of the landings in St. Croix. The number of fish traps, the prevalent fishing gear, were estimated to have increased since 1978 (Figure 1b) while annual catch per trap has decreased from about 350 lbs/yr in 1979 to 100 lbs/yr in 1987 (Figure 1c).

Concern was expressed that the number of actively fished traps may be a poor indication of total fishing effort because an unknown number of traps are lost and still actively fish. Surveys by USVI Division of Fish and Wildlife have found numerous lost traps without escape panels that were still catching fish. These traps were classified as lost because buoy lines were cut, traps were heavily fouled, or floats had been fouled and submerged.

Biostatistical Summaries

Biostatistical data were used to prepare size-frequency graphs for species with greater than 30 observations (Appendix A). The mean length and weight were then noted by area (Tables 4 & 5) and gear type (Tables 6 & 7). By relating tables and graphs, a simple evaluation was made for the most frequent species to note if the mean capture length by area was generally increasing, decreasing or staying relatively stable. Discussion is made at the family level for the purpose of this report. Data for individual species can be examined in Tables 4-7 and Appendix A.

1. Scaridae (Parrotfish). Parrotfishes are generally caught in fish traps. All 4 species (Sparisoma chrysopterum, S. viride, Scarus vetula and S. taeniopterus) which met the statistical restrictions (>30 observations) displayed a decrease in mean capture size over time for USVI. It is important to note that all reported scarids decreased in mean capture size even though the St. Croix data included a increase in fish trap mesh size from 1 1/2" to 2". It was not possible to determine size trends for parrotfishes for Puerto Rico because the 1985 data were not species specific as most parrotfishes were categorized in general classes (e.g., first class, second class, etc.).

2. Haemulidae (Grunts). Overall, haemulids captured in fish traps tended to decrease in mean size over time. Four haemulids (Haemulon)were traditionally reported from the U.S. Caribbean fishery, however a recent addition of Pomadasys crocro was noted (St. Croix 1990). Two species (H. flavolineatum and H. sciurus) did not appear in the 1990 St. Croix biostatistical data, presumably because they were successfully escaping through the larger meshed fish pots. H. carbonarium and H. plumieri appeared to be maintaining mean size of capture in St. Croix, possibly because of the change to larger trap mesh. H. plumieri from St. Thomas/St. John decreased in size. In Puerto Rico H. flavolineatum decreased in size over time.

3. Lutjanidae (Snappers). The mean size of Ocyurus chrysurus decreased over time in Puerto Rico. In St. Croix mean size increased from 1985 to 1990 most likely due to the larger trap mesh size. Etelis oculatus, a deep water reef snapper, had a relatively stable mean capture size in St. Croix. The other lutjanids (all Lutjanus) also appear to be maintaining a relatively stable mean capture size over time.

4. Acanthuridae (Surgeonfishes). Surgeonfishes were much more important in the USVI fishery than for that of Puerto Rico due to consumer preference. None of the three reported USVI surgeonfish were influential in the Puerto Rico biostatistical database, perhaps because they were listed by market category or are not in demand. However, in both St. Croix and St. Thomas/St. John the mean capture size of all three species (Acanthurus coerulerus, A. bahianus and A. chirurgus) decreased over time. The mean capture size of St. Croix surgeonfishes did not have as much of a decline as that reported from St. Thomas/St. John, presumably due to the switch to a larger trap mesh size by the St. Croix fisherman.

5. Serranidae (Groupers). Only two groupers, coney (Epinephelus fulvus) and red hind (E. guttatus) were present in more than thirty interviews for both years from one location. The two groupers were reported only from St. Croix and both showed an increase in mean capture size over time. However, very few large individuals were reported in the biostatistical data. It should be noted that the 1990 data for coney had significantly fewer observations (n = 30) than 1985 (n = 1642). Potential reasons for these increases in capture size are discussed later.

6. Mullidae (Goatfish). Goatfishes appeared in the database for Puerto Rico and St. Croix in 1985, but only from Puerto Rico in 1990. Most likely the larger mesh size used in St. Croix allowed them to escape. In Puerto Rico the mean capture size of both Mulloidichthys martinicus and Pseudupeneus maculatus decreased over time.

7. Sparidae (Porgy), Balistidae (Triggerfish), Ostraciidae (Trunkfish) and Labridae (Wrasses). The porgies (Calamus bajonado, C. pennatula), triggerfish (Balistes vetula), and one trunkfish (Lactophrys polygonia), decreased in mean size over time for Puerto Rico. Mean size of capture for L. quadricornis remained stable. Data from St. Croix showed an absence of porgies and a decrease in the mean capture size of B. vetula and L. polygonia over time. The mean size of hogfish (Lachnolaimus maximus) increased over time for Puerto Rico.

Insufficient data existed to examine size differences for Carangids (Jacks), Holocentrids (Squirrelfish), and Pomacanthids (Angelfish).

Length-frequency Analyses

Further analyses were conducted at the workshop on the sources of variation in length-frequency distributions. Because of the relative abundance of data, primary emphasis was given to the red hind, with distributions available from St. Croix, St. Thomas/St. John and Puerto Rico (Figures 2 and 3). Growth curves from Sadovy et al. (in review) for Puerto Rico and St. Thomas were used to convert lengths to ages; the St. Thomas/ St. John curve was applied to the St. Croix data. In addition, Sadovy and Figuerola (in press) presented catch curves for Puerto Rico and St. Thomas. Distinct variations were evident between years in length-frequency distributions.

Our analyses showed that variations in red hind recruitment largely explain the above differences. Data from St. Croix (Figure 4) showed low recruitment for the last three years (1987-90). Good year classes that were spawned in 1980 (located at 350 mm in 1988) and 1983 probably have been supporting the fishery over the past few years. Mean size of the red hind has been increasing steadily from 292 mm in 1987 to 342 mm in 1990. This increase resulted primarily from poor recruitment and the absence of small individuals, coupled with the relative abundance of now large individuals from the earlier dominant year classes. The data also show that these older fish are disappearing (due to

fishing and natural mortality). The switch to larger trap mesh size does not account for this pattern as smaller size classes continued to diminish after the switch was completed. Because the larger individuals will not be replaced due to poor recruitment in recent years, catches are predicted to decline; a trend already evident in the last 2 years.

In St. Thomas, the red hind fishery in 1984 was dominated by the 1974 year class (observed at 374-400 mm in 1984) (Figure 5). Poor recruitment occurred in 1985-86, resulting in a shift in the size distribution to larger fishes. A large recruiting year class spawned in 1985 was evident in 1986 (located at 200 mm); recruitment of this class over the next 2 years shifted the length-frequency distribution to the left. The 1974 year class was still present in 1988, representing what few large fish that remained. A previous comparison of the 1984 and 1988 data (Beets and Friedlander, in press) attributed the decline in large fish to overfishing. This can now be seen to be due to variations in recruitment and specifically the decline of the dominant 1974 year class.

Puerto Rico data show a prominent newly recruited red hind year class in 1984 (Figure 6). A lesser peak (located at 375 mm) probably represents the 1974 year class. Recruitment to the fishery in 1986 (data not available) was likely sufficient to cause a shift to the left (smaller) in the size-frequency distribution in 1987. This probably was due to recruitment of the 1982 year class. Recruitment to the fishery for the last 3 years has been relatively poor. Mean length has steadily increas- ed from 250 mm in 1984 to 303 mm in 1990. As in the Virgin Islands, this result is primarily due to recruitment declines and aging of dominant year classes. By 1990 the frequency distri- bution has flattened out as the 1974 and 1982 year classes, in particular, have aged, and no large recruitment events have taken their place.

The catch curves presented by Sadovy and Figuerola (in press) clearly show coherence in recruitment between St. Thomas/ St. John and Puerto Rico (Figures 5 and 6). Poor recruitment in the last 3 years in all three areas indicate that the spatial scale of recruitment covers all of the U.S. Caribbean, although local stochastic variations are expected.

The recruitment variation observed in red hind and the effects of this variation on the shapes of length-frequency distributions indicate that pair-wise comparisons of annual length-frequency distributions may give misleading results. One hypothesis is that increased mean size of red hind could indicate recovery of the fishery; an alternative hypothesis is that this has resulted from successive recruitment failure and may indicate just the opposite. Also, long term variations in the environmental and physical factors controlling recruitment may explain these patterns in addition to fishing effects. As an example, length distributions for the goatfish Pseudupeneus maculatus, for 1985 and 1990 (Appendix A, pg 63) might indicate overfishing. However, comparison to distributions in 1974 (Stevenson, 1974) show that size increased from 1974 to 1985. Again, too few data exist to separate fishing effects from recruitment effects.

Long-term data sets are thus necessary for analyses and proper interpretation. One example of an apparent fishing effect is illustrated by 6 years of consecutive data for coney, Epinephelus fulvus, from St. Croix (Figure 7). The decline in large fish has occurred simultaneous with stability in small fish and thus probable stability in recruitment.

Compliance with minimum size limits

Size-frequency data can be used to evaluate the compliance with minimum size limits. However, these data did not distinguish between fishes caught in the EEZ or territorial waters, thereby making it impossible to examine the effectiveness of size limits placed on yellowtail snapper (12") and Nassau grouper (variable between years). It was noted that the majority of measured individuals for yellowtail (Ocyurus chrysurus) were below FMP size limits (Appendix A, pg 60). The workshop concluded that the lack of compatibility with territorial regulations made size limits ineffective.

Nassau grouper (Epinephelus striatus) is currently protected from fishing by the CFMC in the EEZ. There were no data available to evaluate the effectiveness of this regulation although considerable skepticism was expressed about compliance.

Yield-per-recruit

Yield-per-recruit analyses have been conducted for yellowtail snapper (Dennis, in press, a), the white, bluestriped, and French grunts (Dennis, in press, b) based on data from 1984-85, and for lane snapper (Acosta and Appeldoorn, in press) and red hind (Sadovy and Figuerola, in press) based on 1988 data. These analyses were specific to Puerto Rico except for red hind which included St. Thomas data.

Yellowtail snapper in 1984-85 were found to be fully exploited or slightly over-exploited, based on a value of F/Z at or greater than 0.5. A similar situation was found for the white and French grunts for 1985, while bluestriped grunts were not exploited. For white grunt this represented a change from 1974, when the species was considered to be not exploited. Dennis (in press, b) thought that although the grunt species differed in size, a single trap-mesh could be used in the fishery. This was primarily based on the fact that the trap fishery was concentrated along the outer shelf where small white grunts were scarce; thus the smaller mesh needed to maximize the YPR for the smaller species would not adversely affect white grunt. However, Stevenson (1974) found a specific mesh-size to capture white grunt. Since 1985 effort on grunts has declined slightly, while that for yellowtail snapper has remained relatively constant (Dennis et al., in press). The proportion of grunts in the PR demersal landings has declined steadily from a high of 28% in 1977 to 14% by 1985 and 8% in 1989 (Appeldoorn and Meyers, in press), although this may reflect as much a change in fishing areas and gear-types as a decline in abundance.

Lane snapper in 1988 was fully exploited with 91% of maximum YPR being taken (Acosta and Appeldoorn, in press). It was felt that further increases in YPR

would not be possible without increasing F to levels were spawning stock would be adversely affected. Estimates of F/Z indicate that in 1988 red hind were overfished in both Puerto Rico and St. Thomas. To maximize YPR, at $F_{0.1}$, F would have to be reduced by 35% and 20% respectively (Sadovy and Figuerola, in press). Changing size at first capture was not predicted to increase YPR.

Biological Parameters

The assessment team concluded that insufficient data existed to properly characterize biological parameters for most SWRF in Puerto Rico and the Virgin Islands. Important biological parameters for management purposes include growth rate, natural mortality, and fecundity. Sex ratios are also important especially for species that change sex. Puerto Rico DNR has work in progress examining fecundity of red hind and trunkfish. The workshop recommends increased research to measure biological parameters from the U.S. Caribbean reef fish fishery.

CONCLUSIONS

Status of Stocks

The SWRF FMP that became effective in 1985 assumed that the reef fish fishery in the U.S. Caribbean was overfished. Overfishing is occurring, as defined in the SWRF FMP, when a reef fish stock or stock complex is below the level of 20 percent of the spawning stock biomass per recruit that would naturally occur (e.g., without fishing). Although there are insufficient data available from the U.S. Caribbean to calculate these ratios, there is reasonable evidence to suggest that many species continue to be overexploited.

Overall, the reef fish fishery in Puerto Rico has declined from previous levels. In 1931 the fishery had 1403 fishermen and 711 vessels with total landings of 3,080,100 lbs (Jarvis, 1932). In 1989 the fishery had 1822 fishermen and 1107 vessels with total landings of 2,305,004 lbs (Matos and Sadovy, 1990). Although the decline in total landings is disturbing, the most surprising difference is that in 1931 only 9 boats had motors (240 had sails and 462 were rowboats)! We assume that most landings in 1931 were reef organisms because most vessels were unable to fish far from shore. The SWRF assessment workshop panel found particularly alarming the continued decline in total reef fish landings and CPUE from Puerto Rico since the FMP was implemented in 1985.

Although no similar long-term comparison of landings exist for the USVI, we assume that similar changes have occurred. Anecdotal evidence of a decline is provided by the photo used on the cover of a spearfishing catch at Water Island in St. Thomas harbor (published in the February, 1956 issue of National Geographic, pg 221). Currently it would be virtually impossible to make a similar catch by spearfishing at that location. Nassau grouper in particular have become very scarce. The most encouraging observation for the USVI is that total landings have remained stable in recent years despite increased effort. With some exceptions, the SWRF fishery in the Virgin Islands in general appears stable at present levels

of fishing effort and under current fishing practices based on available data. An exception is the decline of larger individuals of grouper such as coney and red hind.

Growth overfishing appears to be a major problem in Puerto Rico, based on the large number of small fishes being landed and the recent declines in total landings. Growth overfishing is occurring when a fishery if removing the spawners and is characterized by smaller (in number and pounds) catches over the years. Recruitment overfishing, on the other hand, is when the fishery is removing recruits (a cohort). A yield-per-recruit analysis would help quantify this situation. The review team was unable, however, to conduct an analysis because of the lack of growth and other essential biological data specifically tuned to Puerto Rico and the Virgin Islands.

Poor recruitment in recent years in both the Virgin Islands and Puerto Rico for red hind should be a particular source of management concern. Data show definite evidence of recruitment variability for red hind and coney in Puerto Rico and St. Croix. Whether this variability is due to natural events, fishery exploitation, or a combination of both cannot be determined from available data. Long-term data sets are necessary for analyses to account for recruitment effects.

Recommendations

The assessment team concluded that most obvious management action to increase the productivity of the SWRF fishery would be to reduce fishing effort. Increasing the minimum mesh size of fish traps to at least 2" is a progressive step but probably will not be sufficient to obtain significant increases in yield, especially if recruitment overfishing is occurring. Rosario and Sadovy (1991) provided experimental evidence supporting the fact that increased mesh size will increase the average size of fish caught. Also direct evidence of increased fish size is provided from St. Croix where a fisherman voluntarily switched to larger meshed traps. Unfortunately, the benefits of switching to larger meshed traps cannot be fully realized with only one or a few fishermen switching.

Establishment of no harvest zones was also recommended as a means to improve the spawning stock size although there was considerable uncertainty concerning whether increased spawning stock in reserves would necessarily benefit local populations.

The review panel recommends increased effort to secure compatible regulations between the CFMC and Commonwealth and Territorial governments. Cooperation and compliance are essential. The workshop noted that even if the CFMC closed entirely the reef fish fishery in the EEZ, that there will be little impact on most reef fishes (especially around Puerto Rico) because so little reef habitat is under direct Council control. Without compatible regulations and cooperation to increase compliance, particularly by the Commonwealth of Puerto Rico, no improvements for the fishery can be anticipated.

Growth and fecundity studies are needed for SWRF in Puerto Rico and the

Virgin Islands to produce yield-per-recruit analyses and calculate spawning potential ratios for representative species. Some effort should be directed at describing the expanding diver-based SWRF fishery and the trammel net and beach seine fisheries particularly in Puerto Rico.

Better information on where fish are captured would be extremely helpful. Although the original FMP discussed differences in landings between territorial and EEZ waters, these could not be examined at the workshop because data that distinguished catch by location within or outside of the EEZ were unavailable.

The workshop recommends that continued efforts be made to standardize and improve data collection, entry, and storage. NMFS data collection programs should be expanded and data files routinely updated to include new Caribbean data, especially state-federal landings data for USVI. All raw data for landings and bioprofile form the USVI should be entered into the database for future analyses.

The inability of managers and researchers to locate and keep up with available literature was noted as a major problem for most of the U.S. Caribbean due to spatial and temporal problems. A suggestion was made that a core collection for Caribbean fishery information be established in the Miami Laboratory, SEFSC and in the Caribbean, which would serve as a resource base for future stock assessments.

SUMMARY OF MAJOR RECOMMENDATIONS

Management Recommendations

1. Establish compatible regulations between the EEZ and the territorial waters.

2. Reduce fishing effort, particularly on small fishes.

3. Protect spawning aggregations.

4. Improve compliance with minimum sizes and other regulations.

5. Increase minimum fish trap mesh size to at least 2" as soon as possible.

6. Include deep water reef fish in the FMP.

7. Initiate marine reserve projects. Identify potential reserve areas, begin baseline studies of flora and fauna.

8. Collect more biological information by species particularly concerning fecundity, growth, and mortality.

Methodological Recommendations

9. Continue to standardize data collection, entry, and storage as much as possible. Document and initiate universal procedures for data collection and entry in the U.S. Caribbean. Expand NMFS data collection programs and data files to routinely update and include new Caribbean data, especially state-federal landings data for USVI and Puerto Rico.

10. Continue to enter the backlog of raw historical fisheries data.

11. Provide precise information on site (e.g., depth, distance from shore) and method of capture by trip.

12. Assist the PRDNR and the USVI in organizing workshops and training programs for port agents and statistics personnel.

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Table 1. Total Reef Fish Landings and Effort Summary

Puerto Rico						USVI d					St Croix		St Thomas/St John	
Year	Total Landings (lbs)	Total Traps	CPUE e (lbs/ trap)	Total Fisher-men	Total Vessels	Year	Projected Finfish Landings (lbs)	Total Traps	CPUE (lbs/ trap)	Licensed Fisher-men	Projected Finfish Landings (lbs)	Licensed Fishermen	Projected Finfish Landings	Licensed Fisher-men
1931 a	3,080,100	4239	na	1403	711									
1951				223										
1964														
1969														
1970														
1971														
1972				970										
1973				930										
1974				1120										
1975 b	3,251,000	8191	294	1230	865	74-75	1,072,000	5337	195	457	181,000	227	891,000	230
1976 b	3,932,000	8967	321	1230	901	75-76	1,015,977	8858	169	509	152,040	197	863,937	312
1977 b	4,395,000	9743	316	1368	1036	76-77	1,196,703	8067	233	846	510,658	225	686,045	621
1978 b	4,728,000	12586	241	1442	1073	77-78	924,472	4182	265	265	289,896	103	634,576	162
1979 b	5,359,000	15252	219	1442	1073	78-79	1,043,849	4482	347	282	251,994	121	791,855	161
1980 b	4,147,000	19165	138	1447	1087	79-80	1,288,215	6418	302	356	449,882	144	838,333	212
1981 b	3,674,000	21368				80-81	1,252,626	7133	256	406	279,119	163	973,507	243
1982 b	3,275,000	23571		1872	1449	81-82	1,822,304	10176	254	578	863,048	322	959,256	256
1983 c	3,067,347	15045	104	1415	1125	82-83	1,276,680			454	386,858	195	889,822	259
1984 c	2,457,087					83-84	1,348,432			437	453,726	182	894,706	255
1985 c	2,599,720	9650	117	1766		84-85	1,209,411	19240	63	437	404,761	182	804,650	255
1986 c	2,296,207	12450	78	1135	865	85-86	1,892,464			536	558,628	206	1,333,836	330
1987 c	1,768,917			1731		86-87	1,866,947	18366	102	529	610,586	200	1,256,361	329
1988 c	1,666,716	11710	45			87-88	1,382,358			523	328,592	217	1,053,766	306
1989 c	1,933,047			1822	1107	88-89	1,583,613			425	587,353	188	996,260	237
1990 c	1,879,606	13555	45											
Mean	3,151,853	13,943	174	1395	1058		1,345,070	9,226	219	469	437,653	189	926,922	281

NOTES:

a Jarvis, 1932.

b Caribbean Council Shallow Water FMP, Table 9.

c Data from Laboratorio de Investigaciones Pesqueras, Departamento de Recursos Naturales de Puerto Rico.

d Data from Division of Fish and Wildlife, USVI.

e The CPUE estimate is only for fish caught with traps.

Table 2. Estimated annual landings of demersal fishes from Puerto Rico in metric tons. From Appeldoorn and Meyers (in press)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Grunts			262.7	316.8	420.0	460.5	482.7	456.4	329.5	75.0	200.5	193.6	165.5	143.2	86.8	76.5	42.3	35.9	53.6
Hogfish			16.4	16.8	25.0	34.1	34.1	35.5	34.5	13.6	32.3	37.3	34.1	21.4		21.8	15.0	11.8	9.9
Trunkfish	19.1	19.1	9.1	10.5	13.6	28.2	35.9	35.9	32.3	22.7	21.8	19.1	20.0	19.1	15.5	18.2	17.3	22.7	21.6
Squirrelfish	34.5	36.4	11.8	9.1	30.0	49.5	50.9	32.7	22.7	6.8	12.3	10.0	5.0	7.7	5.5	1.8	2.3	5.9	2.9
Parrotfish	84.1	118.2	157.3	142.3	137.7	109.5	124.5	173.6	120.0	35.9	127.7	105.5	110.9	108.6	46.4	33.6	5.5	1.8	16.7
Grouper	172.3	151.8	148.6	193.6	241.4	292.3	382.3	447.7	337.3	197.7	211.4	160.9	157.7	160.5	86.8	64.5	42.3	59.5	47.3
Mojarra	0.5	0.0	3.2	7.7	7.7	10.9	12.7	10.0	14.5	10.5	9.5	5.9	5.5	5.0	4.5	3.6	8.2	5.5	7.0
Lane Snapper	51.8	47.7	48.2	50.5	55.9	68.6	167.7	175.9	130.9	90.9	129.1	86.8	76.8	60.9	37.3	27.7	37.3	49.5	51.3
Yellowtail Snapper	45.5	44.1	48.2	65.9	58.2	73.6	100.5	139.5	96.8	51.8	89.5	81.8	66.4	77.3	44.1	45.9	35.5	41.8	48.7
Silk Snapper*	176.4	115.9	120.9	217.3	190.5	167.7	248.2	340.5	389.5	316.4	310.9	190.9	171.4	189.5	148.6	95.5	80.0	112.3	80.2
Mutton Snapper	26.4	26.4	30.9	26.4	35.0	31.4	42.7	53.2	47.7	25.9	31.8	31.8	27.7	23.2	13.2	8.2	10.0	14.5	11.4
Other Snapper	20.9	25.9	20.9	20.0	30.9	35.0	32.3	47.7	44.1	31.8	32.3	30.9	18.2	16.8		9.5	17.3	18.6	21.1
Total Snapper	320.9	260.0	269.1	380.0	370.5	376.4	591.4	736.8	709.1	516.2	593.6	422.3	380.5	367.7	243.2	186.8	180.0	236.8	212.6
Triggerfish	84.5	80.5	55.5	34.1	35.8	45.0	49.5	66.8	75.0	26.4	56.4	44.1	23.6	25.0	12.7	17.3	12.7	15.0	12.9
Porgy	36.8	21.8	24.5	21.4	29.5	28.6	29.1	69.5	58.6	14.1	63.2	37.7	31.8	12.3	8.2	5.0	4.1	4.5	4.1
Goatfish	159.5	151.4	133.6	121.4	131.8	134.1	134.5	193.2	162.7	11.4	71.4	73.9	60.9	27.7	9.5	4.5	3.2	4.5	6.1
Classified First																			82.7
Second																			66.6
Third																			23.2
Trash																			3.5
Other Fish	9.5	53.6	93.6	82.7	72.3	85.5	135.5	123.6	151.4	807.7	148.2	91.4	76.4	107.7	121.4	95.9	61.4	58.6	48.6
Total Demersal Harvest (mt)	921.8	892.8	1,185.4	1,336.5	1,515.3	1,654.5	2,063.1	2,401.7	2,047.5	1,738.6	1,548.3	1,201.6	1,051.9	1,005.9	640.5	529.5	394.4	462.4	619.4
Total Demersal Harvest (lbs x 10^3)	2,033	1,968	2,614	2,947	3,341	3,648	4,549	5,296	4,515	3,834	3,414	2,650	2,320	2,218	1,412	1,168	870	1,020	1,366

*Includes all deepwater snappers

Table 3. Trends in catch per unit effort by species and gear type for Puerto Rico (PR) and St. Croix (SX) based on data plotted in Appendix B. Too few years of data were available to justify the testing of statistical significance of the trends.

Species Location	Units	Gear Type	Trend Direction	Years	
Balistes vetula (Queen Triggerfish)					
	lbs/trip	Bottom line	up	3	PR
	lbs/trip	Fish pots	up	5	PR
Bodianus rufus (Spanish Hogfish)					
	lbs/trip	Gill net	down	3	PR
	lbs/trip	Fish pots	down	3	PR
Epinephelus guttatus (Red Hind)					
	lbs/trip	Bottom line	down	3	PR
	lbs/trip	Fish pots	up	3	PR
	gm/trip	Fish pots	up	4	SX
Etelis oculatus (Queen Snapper)					
	gm/trip	Fish pots	stable	4	SX
Haemulon plumieri (White Grunt)					
	lbs/trip	Bottom line	down	4	PR
	lbs/trip	Fish pots	down	4	PR
	lbs/trip	Gill net	up	4	PR
Holocentrus ascensionis (Squirrelfish)					
	lbs/trip	Fish pots	down	3	PR
Lachnolaimus maximus (Hogfish)					
	lbs/trip	Fish pots	up	4	PR
	lbs/trip	Spear	down	4	PR
Lactophrys trigonus (Trunkfish)					
	lbs/trip	Fish pots	down	3	PR
	lbs/trip	Gill net	down	3	PR
Lutjanus analis (Mutton Snapper)					
	lbs/trip	Bottom line	stable	4	PR
	lbs/trip	Fish pots	up	4	PR
	lbs/trip	Gill net	down	4	PR
Lutjanus buccanella (Blackfin Snapper)					
	gm/trip	Fish pots	up	3	SX
Lutjanus apodus (Schoolmaster Snapper)					
	gm/trip	Fish pots	down	4	SX
Lutjanus synagris (Lane Snapper)					
	lbs/trip	Bottom line	stable	4	PR
	lbs/trip	Fish pots	up	4	PR
	lbs/trip	Gill net	up	4	PR
	lbs/trip	Trotline	down	4	PR
Lutjanus vivanus (Silk Snapper)					
	gm/trip	Fish pots	down	3	SX
Ocyurus chrysurus (Yellowtail Snapper)					
	gm/trip	Fish pots	up	3	SX
	lbs/trip	Bottom line	up	4	PR
	lbs/trip	Fish pots	up	4	PR
	lbs/trip	Gill net	up	4	PR
	lbs/trip	Troll line	down	3	PR

TABLE 4. Comparison of fish length between 1985 and 1990

FAMILY – Family common name *Species name* (Species common name)	ISLAND*	COAST	1985 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN	1990 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN
HOLOCENTRIDAE – Squirrelfishes												
Holocentrus ascensionis	PR	NORTH						7	221.4	15.1	6.8	220.0
(Squirrelfish)	PR	SOUTH						2	207.5	9.2	4.4	207.5
	PR	WEST						1	205.0			205.0
	StC	--	187	204.9	13.8	6.7	205.0	4	227.0			230.0
	StT/StJ	--	99	218.0	28.6	13.1	220.0	2	252.5	3.5	1.4	252.0
Holocentrus rufus	PR	NORTH						1	219.0			219.0
(Longspine squirrelfish)	StC	--						6	225.2			230.0
	StT/StJ	--						86	195.0	15.1	7.8	195.0
Holocentrus spe.	PR	EAST						9	171.2	21.8	12.7	170.0
(Unidentified squirrelfish)	StT/StJ	--	30	225.5	22.4	9.9	227.5					
SERRANIDAE – Sea basses												
Epinephelus adscensionis	PR	EAST	5	246.4	20.3	8.2	250.0					
(Rock hind)	PR	NORTH						1	678.0			678.0
	PR	SOUTH	8	234.5	59.8	25.5	216.5	44	260.3	145.4	55.9	294.5
	PR	WEST						3	420.0	156.9	37.4	380.0
	StC	--	1	337.0			337.0	2	374.5			374.5
	StT/StJ	--	5	420.0	61.8	14.7	455.0	4	372.5	81.8	21.9	410.0
Epinephelus afer	PR	EAST	8	251.1	24.6	9.8	247.5					
(Mutton hamlet)	PR	NORTH	1	282.0			282.0	1	280.0			280.0
	StT/StJ	--						1	225.0			225.0
Epinephelus cruentatus	PR	EAST	2	408.5	98.3	24.1	408.5	221	238.8	30.5	12.8	238.7
(Graysby)	PR	SOUTH						3	243.0	2.7	1.1	244.0
	PR	WEST						3	201.7	23.1	11.5	215.0
	StC	--	8	222.5	20.8	9.3	224.0					
	StT/StJ	--	3	269.3	19.0	7.1	270.0					
Epinephelus flavolimbatus	StT/StJ	--	2	822.5	152.0	18.5	822.5					
(Yellowedge grouper)												
Epinephelus fulvus	PR	EAST	208	247.6	49.1	19.8	240.0	111	239.1	31.3	13.1	235.0
(Coney)	PR	NORTH	14	230.7	30.5	13.2	225.0	118	223.9	31.8	14.2	228.0
	PR	SOUTH	179	224.7	29.7	13.2	225.0					
	PR	WEST	191	222.0	23.8	10.7	220.0					
	StC	--	1644	230.3	20.4	8.9	245.0	20	243.7			251.0
	StT/StJ	--	189	243.7	23.3	9.6	230.0	21	218.8	26.3	12.0	220.0
Epinephelus guttatus	PR	EAST	456	270.4	45.6	16.9	261.0	445	293.7	67.1	22.9	282.0
(Red hind)	PR	NORTH	2	268.0	53.7	20.1	268.0	1	263.0			263.0
	PR	SOUTH	138	282.8	47.3	16.7	284.5	242	334.1	72.6	21.7	330.0
	PR	WEST	136	289.6	44.0	15.2	285.0	89	264.5	30.9	11.7	260.0
	StC	--	567	307.3	54.5	17.7	296.0	469	339.0			342.0
	StT/StJ	--	448	334.8	62.7	18.7	325.0	21	262.4	50.7	19.3	250.0
Epinephelus itajara	PR	EAST	3	331.0	102.2	30.9	313.0	5	437.6	200.5	45.8	346.0
(Jewfish)	PR	SOUTH						4	382.3	284.3	74.4	399.5
Epinephelus morio	PR	EAST	3	451.0	123.8	27.5	406.0	1	256.0			256.0
(Red grouper)	PR	SOUTH						1	465.0			465.0
	StT/StJ	--	10	549.5	101.3	18.4	552.5					
Epinephelus mystacinus	PR	EAST						6	331.7	80.3	24.2	320.5
(Misty grouper)	PR	NORTH						1	238.0			238.0
	PR	WEST						1	130.0			130.0
	StC	--	6	566.2	197.5	34.9	547.5	4	485.0			451.5
	StT/StJ	--	4	946.8	104.5	11.0	999.0					
Epinephelus striatus	PR	EAST	45	381.2	92.2	24.2	377.0	1	352.0			352.0
(Nassau grouper)	PR	NORTH						1	244.0			244.0
	PR	SOUTH	12	262.8	50.6	19.3	247.5	34	430.9	70.2	16.3	440.0
	PR	WEST	7	432.0	126.2	29.2	415.0					
	StC	--	4	390.0	67.8	17.4	385.0	6	400.5			386.0
	StT/StJ	--	73	559.2	90.7	16.2	550.0	1	360.0			360.0
Mycteroperca bonaci	PR	SOUTH						37	560.9	158.4	28.3	550.0
(Black grouper)												
Mycteroperca interstitialis	PR	SOUTH						1	393.0			393.0
(Yellowmouth grouper)	StT/StJ	--	10	422.0	73.2	17.3	417.5					
Mycteroperca tigris	PR	EAST						1	260.0			260.0
(Tiger grouper)	StC	--	2	485.0	226.3	46.7	485.0					
	StT/StJ	--	24	486.3	103.2	21.2	472.5					

TABLE 4. Comparison of fish length between 1985 and 1990 (con't)

FAMILY – Family common name / *Species name* (Species common name)	ISLAND*	COAST	1985 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN	1990 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN
Mycteroperca venenosa	PR	EAST	17	437.8	97.8	22.3	449.0	7	619.4	107.8	17.4	640.0
(Yellowfin grouper)	PR	SOUTH	2	347.0	87.7	25.3	347.0	1	400.0			400.0
	PR	WEST	1	235.0								
	StC	--	11	402.6	124.4	30.9	380.0	3	368.0			350.0
	StT/StJ	--	103	554.7	140.4	25.3	570.0	10	348.5	83.7	24.0	340.0
CARANGIDAE – Jacks												
Caranx bartholomaei	PR	EAST						18	275.9	30.2	11.0	282.0
(Yellow jack)	PR	SOUTH						2	310.5	143.5	46.2	310.5
	PR	WEST						81	453.7	127.2	28.0	470.0
	StC	--	10	382.7	49.6	13.0	376.0					
	StT/StJ	--	5	263.0	18.9	7.2	265.0					
Caranx crysos	PR	EAST	21	216.1	41.7	19.3	210.0	95	361.2	67.3	18.6	370.0
(Blue runner)	PR	NORTH						5	355.2	51.0	14.4	346.0
	PR	WEST						1	257.0			257.0
	StC	--	19	281.8	65.5	23.2	265.0	1	475.0			475.0
	StT/StJ	--	15	386.0	51.6	13.4	370.0					
Caranx hippos	PR	NORTH						22	232.1	154.1	66.4	214.0
(Crevalle jack)	PR	WEST						1	585.0			585.0
Caranx latus	PR	EAST						3	489.7	94.0	19.2	450.0
(Horse–eye jack)	PR	NORTH						42	194.9	68.2	35.0	174.0
	PR	WEST						100	310.2	132.2	42.6	311.0
	StC	--	6	477.8	68.6	14.4	492.5					
	StT/StJ	--	6	414.2	41.4	10.0	402.5					
Caranx lugubris	PR	WEST						34	446.4	57.5	12.9	431.5
(Black jack)	StC	--	5	422.4	76.4	18.1	398.0	6	401.5			394.5
	StT/StJ	--	1	480.0			480.0					
Caranx ruber	PR	EAST						43	288.9	44.8	15.5	290.0
(Bar jack)	PR	NORTH						4	279.5	68.1	24.4	281.5
	PR	SOUTH						50	261.6	33.6	12.8	260.0
	PR	WEST						176	266.3	71.3	26.8	285.5
	StC	--	98	236.3	43.6	18.5	227.0	9	289.8			275.0
	StT/StJ	--	32	301.7	96.9	32.1	292.5	2	227.5	3.5	1.6	227.5
Caranx spe.	StT/StJ	--	3	333.3	135.8	40.7						
(Unidentified jack)												
LUTJANIDAE – Snappers												
Apsilis dentatus	PR	NORTH	1	470.0			470.0					
(Black snapper)								61	337.5			325.0
Etelis oculatus	PR	NORTH						12	609.3	162.9	26.7	612.5
(Queen snapper)	PR	SOUTH	1	190.0			190.0					
	PR	WEST						340	393.2	131.9	33.5	355.5
	StC	--	48	377.5	96.5	25.6	380.0	231	380.7			360.0
	StT/StJ	--	21	602.4	129.5	21.5	595.0					
Lutjanus analis	PR	EAST	30	399.2	135.4	33.9	330.0	81	378.1	157.7	41.7	300.0
(Mutton snapper)	PR	NORTH	7	607.0	95.5	15.7	601.0	9	483.4	139.6	28.9	505.0
	PR	SOUTH	10	389.0	120.9	31.1	387.0	35	306.9	98.1	32.0	290.0
	PR	WEST	6	491.7	101.1	20.6	470.0	200	264.1	115.0	43.5	223.0
	StC	--	17	400.0	105.2	26.3	380.0	7	539.9			590.0
	StT/StJ	--	27	410.0	128.1	31.3	375.0	1	450.0			450.0
Lutjanus apodus	PR	EAST	19	289.9	74.9	25.8	274.0	60	342.1	94.4	27.6	332.5
(Schoolmaster)	PR	NORTH	19	349.3	73.4	21.0	374.0	2	300.5	171.8	57.2	300.5
	PR	SOUTH	26	260.8	32.9	12.6	255.0	51	276.1	74.2	26.9	250.0
	PR	WEST	8	236.1	39.4	16.7	229.5	83	281.3	43.6	15.5	269.0
	StC	--	101	283.0	42.3	14.9	280.0	102	278.5			270.0
	StT/StJ	--	39	312.6	51.3	16.4	300.0	20	240.8	38.8	16.1	232.5
Lutjanus buccanella	PR	EAST	18	233.7	42.2	18.1	226.0	44	278.6	77.2	27.7	273.5
(Blackfin snapper)	PR	NORTH	2	188.0	21.2	11.3	188.0	94	232.8	34.7	14.9	230.0
	PR	WEST						19	354.7	75.0	21.1	350.0
	StC	--	65	277.6	41.7	15.0	275.0	392	284.7			276.0
	StT/StJ	--	180	302.9	47.0	15.5	305.0					
Lutjanus campechanus	PR	NORTH	1	270.0			270.0					
(Red snapper)	StT/StJ	--	1	380.0			380.0					
Lutjanus cyanopterus	PR	EAST						3	529.0	128.8	24.4	550.0

TABLE 4. Comparison of fish length between 1985 and 1990 (con't)

FAMILY – Family common name / *Species name* (Species common name)	ISLAND*	COAST	1985 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN	1990 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN
(Cubera snapper)	PR	WEST						6	642.2	205.1	31.9	642.5
	StC	--	4	260.0	10.8	4.2	257.5					
Lutjanus griseus	PR	EAST	4	219.0	23.8	10.9	217.0	6	353.3	131.6	37.2	320.0
(Gray snapper)	PR	NORTH	4	237.5	27.1	11.4	232.0					
	PR	SOUTH						2	300.0	28.3	9.4	300.0
	PR	WEST						2	325.5	34.7	10.6	325.5
	StT/StJ	--	1	780.0			780.0					
Lutjanus jocu	PR	EAST	4	492.5	171.8	34.9	475.5					
(Dog snapper)	PR	NORTH	9	329.1	67.2	20.4	321.0	3	331.7	132.6	40.0	276.0
	PR	SOUTH	6	238.5	31.4	13.2	255.0	34	391.9	106.5	27.2	386.5
	PR	WEST						1	322.0			322.0
	StC	--	3	323.7	62.7	19.4	290.0	4	308.3			265.0
	StT/StJ	--	16	497.2	121.8	24.5	540.0	1	385.0			385.0
Lutjanus mahogoni	PR	EAST	10	327.6	51.9	15.9	327.0	2	330.0	77.8	23.6	330.0
(Mahogany snapper)	PR	NORTH	7	318.3	30.0	9.4	303.0	2	262.5	74.3	28.3	262.5
	PR	SOUTH	9	230.7	22.4	9.7	218.0					
	PR	WEST	1	200.0			200.0	8	316.5	17.7	5.6	312.0
	StC	--	12	222.8	20.6	9.2	223.5	16	244.2			241.0
	StT/StJ	--	12	263.8	26.0	9.9	252.5	2	285.0	56.6	19.9	285.0
Lutjanus spe.	PR	NORTH						1	210.0			210.0
(Unidentified snapper)	PR	WEST						2	447.5	24.8	5.5	447.5
Lutjanus synagris	PR	EAST	208	226.3	36.6	16.2	218.0	309	239.9	39.8	16.6	235.0
(Lane snapper)	PR	NORTH	10	262.5	45.8	17.5	246.5	122	245.7	35.3	14.4	240.0
	PR	SOUTH	102	206.7	26.3	12.7	201.5	238	209.6	36.3	17.3	202.5
	PR	WEST	109	219.9	29.3	13.3	216.0	1,503	234.0	36.9	15.8	230.0
	StC	--	4	220.8	24.5	11.1	255.0	8	238.3			236.5
	StT/StJ	--	103	259.8	61.1	23.5	230.0	8	210.0	22.0	10.5	212.5
Lutjanus vivanus	PR	EAST	18	310.6	55.0	17.7	300.0	223	276.5	56.1	20.3	266.0
(Silk snapper)	PR	NORTH	159	229.6	45.7	19.9	220.0	403	261.6	51.7	19.8	254.0
	PR	SOUTH	3	262.7	56.2	21.4	247.0					
	PR	WEST	1	155.0			155.0	22	339.4	106.2	31.3	327.5
	StC	--	165	378.3	68.0	18.0	375.0	603	326.8			310.0
	StT/StJ	--	36	296.4	141.5	47.7	225.0	4	213.8	8.5	4.0	212.5
Ocyurus chrysurus	PR	EAST	521	294.9	57.4	19.5	290.0	854	271.9	51.8	19.1	263.0
(Yellowtail snapper)	PR	NORTH	402	284.7	37.5	13.2	284.0	115	318.8	45.6	14.3	314.0
	PR	SOUTH	43	248.1	38.0	15.3	255.0	277	246.0	43.6	17.7	242.0
	PR	WEST	30	241.9	39.7	16.4	237.0	873	262.5	53.7	20.4	255.0
	StC	--	610	275.5	63.6	23.1	257.0	69	283.0			277.0
	StT/StJ	--	456	341.5	61.5	18.0	325.0	12	268.8	82.1	30.5	245.0
Rhomboplites aurorubens	PR	EAST	58	206.7	16.1	7.8	206.0	443	217.3	35.2	16.2	212.0
(Vermilion snapper)	PR	NORTH	104	197.2	27.7	14.0	194.0	307	201.3	25.6	12.7	198.0
	PR	WEST						86	201.9	56.9	28.2	183.0
	StC	--	14	357.2	32.8	9.2	357.5	110	284.6			275.5
	StT/StJ	--	6	202.5	35.0	17.3	210.0					
HAEMULIDAE – Grunts												
Anisotremus surinamensis	PR	EAST						20	265.3	41.3	15.6	251.0
(Black margate)	PR	WEST						1	260.0			260.0
	StT/StJ	--	2	335.0	35.4	10.6	335.0					
Anisotremus virginicus	PR	EAST						32	230.1	70.6	30.7	223.5
(Porkfish)	PR	SOUTH	2	247.0	94.8	38.4	247.0	27	201.6	20.7	10.3	198.0
	PR	WEST						38	227.5	24.8	10.9	223.5
	StC	--	13	217.1	26.6	12.3	210.0	7	229.3			225.0
	StT/StJ	--	8	303.1	65.0	21.4	292.5					
Conodon nobilis	PR	EAST						53	263.2	32.3	12.3	267.0
(Barred grunt)												
Haemulon album	PR	EAST	19	290.0	97.7	33.7	245.0	8	289.1	80.0	27.7	280.0
(Margate)	PR	SOUTH	2	217.5	10.6	4.9	217.5					
	StC	--	3	445.3	144.8	32.5	435.0					

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Species name (Species common name)	ISLAND*	COAST	1985 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN	1990 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN
	StT/StJ	--	21	506.3	92.4	18.2	525.0					
Haemulon aurolineatum	PR	EAST	12	220.7	26.5	12.0	216.0	6	156.0	10.8	6.9	154.0
(Tomtate)	PR	NORTH						23	158.8	22.6	14.2	153.0
	PR	SOUTH	5	233.8	14.2	6.1	243.0					
	PR	WEST						1	182.0			182.0
	StT/StJ	--	20	226.8	22.5	9.9	227.5					
Haemulon bonariense	PR	EAST	1	220.0			220.0					
(Black grunt)	PR	SOUTH						1	193.0			193.0
	PR	WEST						2	287.0	43.8	15.3	287.0
Haemulon carbonarium	PR	EAST						14	241.6	40.3	16.7	222.5
(Caesar grunt)	PR	WEST						4	208.3	12.6	6.1	203.0
	StC	--	31	206.7	14.6	7.1	209.0	116	209.9			210.0
Haemulon chrysargyreum	PR	WEST						3	159.0	5.2	3.3	162.0
(Smallmouth grunt)												
Haemulon flavolineatum	PR	EAST	82	219.5	27.6	12.6	220.5	9	196.8	32.9	16.7	182.0
(French grunt)	PR	SOUTH	57	167.9	16.0	9.5	170.0	16	180.5	7.1	3.9	181.5
	PR	WEST	69	178.8	15.4	8.6	175.0	21	173.7	26.5	15.3	172.0
	StC	--	232	190.4	14.9	7.8	190.0	14	184.8			181.0
	StT/StJ	--	12	198.3	13.0	6.6	200.0	27	171.5	16.4	9.6	170.0
Haemulon macrostomum	PR	EAST	15	220.1	28.4	12.9	217.0	47	215.0	30.5	14.2	210.0
(Spanish grunt)	PR	NORTH	4	206.8	13.4	6.5	206.5					
	PR	SOUTH	28	201.9	42.9	21.2						
	PR	SOUTH	15	188.5	26.2	13.9	189.0					
	PR	WEST						2	302.5	38.9	12.9	302.5
	StC	--						1	310.0			310.0
	StT/StJ	--	6	347.5	22.1	6.4	355.0					
Haemulon melanurum	PR	EAST	1	210.0			210.0					
(Cottonwick)	PR	SOUTH	1	235.0			235.0					
	StC	--	1	206.0			206.0	2	236.0			236.0
	StT/StJ	--	12	232.5	14.7	6.3	230.0	15	191.7	19.1	10.0	195.0
Haemulon parrai	PR	EAST	7	252.1	11.1	4.4	255.0	65	235.3	28.9	12.3	240.0
(Sailor's choice)	StT/StJ	--						2	242.5	31.8	13.1	242.5
Haemulon plumieri	PR	EAST	530	213.8	24.5	11.5	210.5	996	229.1	29.5	12.9	230.0
(White grunt)	PR	NORTH	57	252.2	35.5	14.1	251.0	15	260.0	42.3	16.3	246.0
	PR	SOUTH	320	205.7	29.0	14.1	205.5	636	209.1	38.6	18.4	208.0
	PR	WEST	186	213.5	38.7	18.1	210.0	1,001	211.9	34.0	16.0	214.0
	StC	--	1588	217.9	20.5	9.4	215.0	603	218.7			215.0
	StT/StJ	--	39	289.9	81.3	28.0	285.0	75	209.5	125.8	12.3	205.0
Haemulon sciurus	PR	EAST	36	221.8	31.0	14.0	211.5	173	231.3	31.6	13.7	230.0
(Bluestriped grunt)	PR	NORTH						1	274.0			274.0
	PR	SOUTH	88	217.6	29.2	13.4	221.0	88	204.9	27.6	13.5	205.5
	PR	WEST	17	228.1	30.8	13.5	215.0	94	217.5	31.9	14.7	212.5
	StC	--	138	234.1	19.3	8.3	231.0					
	StT/StJ	--	23	249.4	29.3	11.7	240.0	55	215.1	28.2	13.1	210.0
Haemulon sp.	PR	NORTH	1	282.0			282.0					
(Unidentified grunt)	PR	SOUTH						1	232.0			232.0
Pomadasys crocro	PR	NORTH						1	240.0			240.0
(Burro grunt)								45	236.6			235.0
SPARIDAE -- Porgies												
Archosargus rhomboidalis	PR	EAST						1	172.0			172.0
(Sea bream)	PR	SOUTH						4	192.3	18.7	9.7	184.5
	PR	WEST						2	182.5	10.6	5.8	182.5
	StT/StJ	--	7	234.3	11.0	4.7	235.0					
Calamus bajonado	PR	EAST	99	211.1	26.3	12.5	200.0	5	235.8	52.3	22.2	209.0
(Jolthead porgy)	PR	SOUTH	15	220.3	40.4	18.3	212.0	281	195.0	29.6	15.2	190.0
	PR	WEST						232	190.7	39.5	20.7	181.0
	StC	--						5	282.8			295.0
	StT/StJ	--						188	199.8	36.7	18.4	190.0
Calamus penna	PR	EAST	480	209.4	38.2	18.2	204.0		196.1	21.3	10.9	191.0
(Sheepshead porgy)	PR	NORTH						2	187.0	11.3	6.1	187.0
	PR	SOUTH	82	197.3	32.9	16.7	193.0	23	197.3	29.9	15.2	188.0
	PR	WEST	65	182.3	29.8	16.3	180.0	74	184.0	31.6	17.2	175.0

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FAMILY – Family common name / *Species name* (Species common name)	ISLAND*	COAST	1985 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN	1990 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN
MULLIDAE – Goatfishes												
Mulloidichthys martinicus	PR	EAST	10	229.0	29.0	12.7	222.0	8	159.1	18.7	11.7	151.5
(Yellow goatfish)	PR	NORTH						3	199.3	8.1	4.1	203.0
	PR	SOUTH	49	211.1	26.1	12.4	212.0	36	208.1	21.7	10.4	205.5
	PR	WEST	31	216.2	23.8	11.0	210.0	64	180.0	28.8	16.0	167.5
	StC	--	547	208.0	15.1	7.3	205.0	2	250.0			250.0
	StT/StJ	--	22	260.2	29.9	11.5	250.0	36	248.8	32.4	13.0	245.0
Pseudupeneus maculatus	PR	EAST	871	198.5	19.9	10.0	199.0	108	191.5	24.9	13.0	190.0
(Spotted goatfish)	PR	SOUTH	190	194.4	20.6	10.6	195.0	23	199.2	27.3	13.7	207.0
	PR	WEST	204	193.8	21.9	11.3	195.0	339	175.0	28.9	16.5	174.0
	StC	--	125	207.0	18.2	8.8	203.0					
	StT/StJ	--	3	236.7	38.2	16.1	245.0	8	232.5	19.3	8.3	242.5
EPHIPPIDAE – Spadefishes												
Chaetodipterus faber	PR	WEST						1	271.0			271.0
(Atlantic spadefish)	StC	--	1	295.0			295.0					
CHAETODONTIDAE – Butterflyfishes												
Chaetodon ocellatus	StT/StJ	--	2	125.0	0.0	0.0	125.0					
(Spotfin butterflyfish)												
POMACANTHIDAE – Angelfishes												
Holacanthus ciliaris	StC	--	9	276.1	50.3	18.2	280.0	67	359.5			250.0
(Queen angelfish)	StT/StJ	--	14	294.3	41.6	14.1	285.0	7	206.4	135.4	17.2	200.0
Holacanthus tricolor	StC	--	31	208.5	12.9	6.2	207.0	66	212.7			213.0
(Rock beauty)	StT/StJ	--	6	202.5	13.3	6.6	200.0	1	180.0			180.0
Pomacanthus arcuatus	PR	WEST						1	305.0			305.0
(Gray angelfish)	StC	--	17	303.1	68.9	22.7	300.0	15	295.9			297.0
	StT/StJ	--	82	310.9	64.8	20.8	313.0	5	181.0	36.1	20.0	170.0
Pomacanthus paru	StC	--	13	269.5	54.3	20.1	247.0	16	262.4			260.0
(French angelfish)	StT/StJ	--	17	297.9	80.2	26.9	315.0	6	165.0	19.5	11.8	165.0
LABRIDAE – Wrasses												
Bodianus rufus	PR	SOUTH						6	285.8	14.0	4.9	290.5
(Spanish hogfish)	PR	WEST						2	283.5	26.2	9.2	283.5
	StC	--	15	244.7	28.4	11.6	232.0	5	256.4			256.0
	StT/StJ	--	12	272.5	20.6	7.6	270.0					
Halichoeres radiatus	PR	EAST	1	229.0			229.0	1	283.0			283.0
(Puddingwife)	PR	SOUTH	1	273.0			273.0					
	StC	--	5	292.0	48.7	16.7	315.0	1	242.0			242.0
	StT/StJ	--	3	296.7	33.3	11.2	280.0					
Lachnolaimus maximus	PR	EAST	17	318.9	68.6	21.5	299.0	7	474.9	105.1	22.1	455.0
(Hogfish)	PR	SOUTH	19	348.7	110.3	31.6	301.0	176	397.3	106.6	26.8	393.5
	PR	WEST	17	372.7	123.6	33.2	315.0	21	282.3	60.9	21.6	268.0
	StC	--	3	329.7	29.3	8.9	318.0	1	292.0			292.0
	StT/StJ	--	27	504.2	116.1	23.0	530.0	8	248.1	29.4	11.9	247.5
SCARIDAE – Parrotfishes												
Scarus coelistinus	PR	SOUTH						2	610.0	77.8	12.8	610.0
(Midnight parrotfish)												
Scarus coeruleus	PR	NORTH						24	197.8	13.7	6.9	195.0
(Blue parrotfish)												
Scarus guacamaia	PR	SOUTH						6	579.7	103.5	17.9	582.5
(Rainbow parrotfish)	StT/StJ	--	3	615.0	62.7	10.2	610.0					
Scarus spe.	PR	EAST						2	270.0	28.3	10.5	270.0
(Unidentified parrotfish)	StT/StJ	--	1	240.0			240.0					
Scarus taeniopterus	PR	EAST						1	250.0			250.0
(Princess parrotfish)	PR	SOUTH						50	247.9	24.9	10.1	244.0
	PR	WEST						13	269.9	32.3	12.0	258.0
	StC	--	167	257.6	19.9	7.7	256.0	49	244.5			243.0
	StT/StJ	--	29	245.0	23.6	9.6	235.0	8	192.5	22.2	11.5	195.0

TABLE 4. Comparison of fish length between 1985 and 1990 (con't)

FAMILY – Family common name / *Species name* (Species common name)	ISLAND*	COAST	1985 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN	1990 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN
Scarus vetula	PR	EAST						5	304.0	11.4	3.8	300.0
(Queen parrotfish)	PR	SOUTH						16	270.4	72.6	26.8	283.5
	PR	WEST						63	303.9	30.7	10.1	305.0
	StC	--	10	330.7	38.0	11.5	328.5	35	308.9			307.0
	StT/StJ	--	1	365.0			365.0	2	280.0	14.1	5.1	280.0
Sparisoma aurofrenatum	PR	SOUTH						15	236.3	11.9	5.0	235.0
(Redband parrotfish)	PR	WEST						37	233.2	30.7	13.2	222.0
	StC	--	217	216.7	9.4	4.3	217.0	16	240.9			247.5
	StT/StJ	--	25	223.2	35.9	16.1	220.0	15	223.0	10.8	4.9	220.0
Sparisoma chrysopterum	PR	EAST						189	257.7	41.7	16.2	260.0
(Redtail parrotfish)	PR	SOUTH						193	248.2	23.6	9.5	250.0
	PR	WEST						345	266.5	27.7	10.4	270.0
	StC	--	1862	262.4	20.1	7.7	263.0	1,253	253.9			250.0
	StT/StJ	--	93	284.1	33.9	11.9	285.0	51	249.0	25.4	10.2	245.0
Scarus rubripinne	PR	EAST						13	254.9	27.6	10.8	255.0
(Redfin parrotfish)	PR	WEST						1	315.0			315.0
	StC	--						4	246.3			246.5
	StT/StJ	--						9	243.9	44.1	18.1	260.0
Sparisoma spe.	PR	EAST						256	220.9	38.5	17.4	220.0
(Unidentified parrotfish)	PR	SOUTH						3	215.0	45.1	21.0	191.0
	PR	WEST						39	202.3	44.2	21.9	185.0
	StC	--	3	229.3	12.9	5.6	233.0					
	StT/StJ	--	190	250.7	47.0	18.7	241.0					
Sparisoma viride	PR	EAST						107	260.9	30.6	11.7	255.0
(Stoplight parrotfish)	PR	SOUTH	1	180.0			180.0	154	260.2	31.8	12.2	257.5
	PR	WEST						518	285.0	33.3	11.7	285.5
	StC	--	1693	283.3	31.1	11.0	305.0	1,257	269.1			267.0
	StT/StJ	--	53	315.0	51.9	16.5	285.0	37	243.5	38.7	15.9	250.0
ACANTHURIDAE – Surgeonfishes												
Acanthurus bahianus	StC	--	355	190.0	11.1	5.8	190.0	135	188.8			189.0
(Ocean surgeon)								189	166.9	27.6	16.5	165.0
Acanthurus chirurgus	StC	--	227	233.2	25.6	11.0	235.0	575	218.4			216.0
(Doctorfish)	StT/StJ	--	139	249.0	33.8	13.6	250.0	23	188.9	21.1	11.2	190.0
Acanthurus coeruleus	StC	--	2063	184.8	17.2	9.3	182.0	1,162	171.2			170.0
(Blue tang)	StT/StJ	--	410	200.1	29.3	14.6	200.0	199	160.3	25.6	16.0	160.0
Acanthurus spe.	StC	--	192	192.0	10.2	5.3	192.0					
(Unidentified Acanthurid)												
BALISTIDAE – Leatherjackets												
Balistes spe.	PR	EAST						1	240.0			240.0
(Unidentified triggerfish)												
Balistes vetula	PR	EAST	88	301.2	47.8	15.9	297.0	37	292.7	34.8	11.9	290.0
(Queen triggerfish)	PR	NORTH	3	305.3	26.8	8.8	301.0	1	322.0			322.0
	PR	SOUTH	165	250.3	46.8	18.7	246.0	32	256.3	47.7	18.6	255.0
	PR	WEST	86	295.9	51.4	17.4	290.0	56	260.5	51.5	19.8	248.5
	StC	--	815	282.4	48.3	17.1	320.0	180	265.0			260.0
	StT/StJ	--	509	316.4	51.7	16.3	275.0	44	288.8	50.6	22.1	227.5
Canthidermis sufflamen	StC	--	13	369.7	33.5	9.1	365.0	1	415.0			415.0
(Ocean triggerfish)	StT/StJ	--	3	340.0	10.0	2.9	340.0					
Melichthys niger	StC	--	1	260.0			260.0					
(Black durgon)												
OSTRACIIDAE – Boxfishes												
Lactophrys bicaudalis	PR	EAST	15	170.4	30.6	17.9	166.0	1	221.0			221.0
(Spotted trunkfish)	PR	SOUTH	53	182.9	41.2	22.5	175.0	9	193.6	19.9	10.3	194.0
	PR	WEST	11	217.1	50.1	23.1	206.0	9	256.3	140.1	54.6	192.0
	StC	--	12	180.1	17.9	9.9	175.0	20	200.9			182.5
	StT/StJ	--	1	175.0			175.0	7	197.1	26.6	13.5	195.0
Lactophrys polygonia	PR	EAST	90	223.2	37.5	16.8	219.0	56	229.9	38.2	16.6	223.5
(Honeycomb cowfish)	PR	SOUTH	77	219.2	43.2	19.7	213.0	47	227.0	38.8	17.1	225.0
	PR	WEST	36	275.4	41.3	15.0	270.0	19	190.0	21.5	11.3	190.0
	StC	--	199	246.8	37.6	15.3	248.0	622	241.8			240.0
	StT/StJ	--						86	185.0	34.9	18.9	175.0

TABLE 4. Comparison of fish length between 1985 and 1990 (con't)

FAMILY – Family common name / *Species name* (Species common name)	ISLAND*	COAST	1985 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN	1990 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN
Lactophrys quadricornis	PR	EAST	73	201.6	29.1	14.4	197.0	27	199.1	48.1	24.2	200.0
(Scrawled cowfish)	PR	SOUTH	97	207.7	42.9	20.7	200.0	13	246.2	33.7	13.7	240.0
	PR	WEST	49	207.4	39.2	18.9	215.0	8	242.3	41.4	17.1	250.0
	StC	--	9	281.2	30.1	10.7	290.0	26	266.9			268.0
	StT/StJ	--						5	231.0	45.3	19.6	220.0
Lactophrys trigonius	PR	EAST	12	283.8	70.9	25.0	306.0	3	360.3	21.5	6.0	350.0
(Trunkfish)	PR	SOUTH	5	317.2	23.6	7.5	308.0	3	217.3	82.6	38.0	180.0
	PR	WEST						18	268.8	90.2	33.5	273.5
	StC	--	2	235.0	120.2	51.2	235.0					
Lactophrys triqueter	PR	EAST	18	161.6	33.2	20.6	151.0	13	166.8	20.2	12.1	170.0
(Smooth trunkfish)	PR	SOUTH	22	174.0	34.7	19.9	167.5	7	165.3	18.4	11.1	167.0
	PR	WEST	9	181.7	36.1	19.9	175.0	5	333.4	117.4	35.2	350.0
	StC	--	19	169.4	15.1	8.9	168.0	89	162.3			160.0
	StT/StJ	--						33	190.6	23.6	12.4	195.0
UNKNOWN – UNKNOWN												
Uncategorized fish	PR	EAST	213	206.2	60.9	29.6						
(Multiple species)	StC	--	9	111.0	333.0	300.0						
	StT/StJ	--	4	252.5	168.6	66.8						
	StT/StJ	--	1	730.0								
Unidentified sp.	PR	EAST	1	0.0								
(Unidentified species)	PR	EAST	1	145.0								
	PR	SOUTH	3	0.0	0.0							
	StC	--	20	723.9	77.8	10.7						
	TOTAL =		**26,294**					**26,054**				

* ISLAND CODES

TABLE 5. Comparison of fish weight between 1985 and 1990

FAMILY – Family common name / *Species name* (Species common name)	ISLAND*	COAST	1985 WEIGHT IN GRAMS N	MEAN	STD	CV	MEDIAN	1990 WEIGHT IN GRAMS N	MEAN	STD	CV	MEDIAN
HOLOCENTRIDAE – Squirrelfishes												
Holocentrus ascensionis	PR	NORTH						7	205.0	56.6	35.4	210.0
(Squirrelfish)	PR	SOUTH						2	160.0			160.0
	PR	WEST						1	160.0			160.0
	STC	--	187	182.6	40.3	22.1	175.0	4	250.0			250.0
	StT/StJ	--	99	301.7	631.9	209.4	225.0					
Holocentrus rufus	PR	NORTH						1	165.0			165.0
(Longspine squirrelfish)	StT/StJ	--						84	198.2	42.7	21.5	
	PR	EAST						9	125.0	44.2	35.4	122.0
	STC	--						1	150.0			150.0
Holocentrus spp.	StT/StJ	--	30	221.0	57.9	26.2	200.0					
(Unidentified squirrelfish)												
SERRANIDAE – Sea basses												
Epinephelus adscensionis	PR	EAST	5	253.2	66.6	26.3	272.0					
(Rock hind)	PR	NORTH						1	5,102.0			5,102.0
	PR	SOUTH	8	165.5	189.9	114.8	120.0	44	702.3	376.6	53.6	597.5
	PR	WEST						3	931.7	631.4	67.8	810.0
	STC	--	1	800.0			800.0					
	StT/StJ	--	5	1,345.0	512.5	38.1	1,525.0	1	600.0			600.0
Epinephelus afer	PR	EAST	8	251.8	90.3	35.9	237.5					
(Mutton hamlet)	PR	NORTH	1	346.0			346.0	1	370.0			370.0
Epinephelus cruentatus	PR	EAST	2	1,238.0	937.6	75.7	1,238.0	221	245.1	101.3	41.3	225.0
(Graysby)	PR	SOUTH						3	323.3	218.3	67.5	210.0
	PR	WEST						1	150.0			150.0
	STC	--	8	162.3	49.8	30.7	175.0					
	StT/StJ	--	3	350.0	109.0	31.1	400.0					
Epinephelus flavolimbatus	StT/StJ	--	2	7,549.5	3,464.1	45.9	7,549.5					
(Yellowedge grouper)												
Epinephelus fulvus	PR	EAST	208	289.1	438.5	151.7	222.0	111	244.8	115.0	47.0	220.0
(Coney)	PR	NORTH	14	208.7	90.5	43.4	184.5	6	162.3	36.9	22.7	160.0
	PR	SOUTH	179	182.2	71.4	39.2	176.0	114	191.3	68.3	35.7	182.5
	PR	WEST	191	165.3	49.6	30.0	163.0	29	198.5	67.1	33.8	205.0
	STC	--	1,644	208.2	57.9	27.8	200.0	20	280.0			250.0
	StT/StJ	--	189	255.9	75.4	29.5	250.0	21	315.5	97.3	30.8	200.0
Epinephelus guttatus	PR	EAST	456	325.0	217.4	66.9	265.0	444	433.9	284.0	65.4	330.0
(Red hind)	PR	NORTH	2	275.5	146.4	53.1	275.5	1	205.0			205.0
	PR	SOUTH	138	336.6	183.9	54.6	308.0	233	590.9	368.5	62.4	520.0
	PR	WEST	136	362.1	208.5	57.6	297.0	85	236.9	98.8	41.7	215.0
	STC	--	567	510.2	339.5	66.6	397.0	436	759.1			725.0
	StT/StJ	--	448	641.9	406.4	63.3	525.0	15	376.7	141.6	37.6	475.0
Epinephelus itajara	PR	EAST	3	751.0	742.9	98.9	472.0	5	1,970.0	3,464.1	175.8	460.0
(Jewfish)	PR	SOUTH						4	19,630.3	14,504.6	73.9	17,241.5
Epinephelus morio	PR	EAST	3	1,578.7	1,259.0	79.8	1,036.0	1	225.0			225.0
(Red grouper)	PR	SOUTH						0				
	StT/StJ	--	10	2,870.0	1,576.6	54.9	2,775.0					
Epinephelus mystacinus	PR	EAST						6	716.2	465.1	64.9	527.5
(Misty grouper)	PR	NORTH						1	11,907.0			11,907.0
	PR	WEST						1	24,947.0			24,947.0
	STC	--	6	3,803.3	3,622.9	95.3	2,875.0					
	StT/StJ	--	4	9,999.0	0.0	0.0	9,999.0					
Epinephelus striatus	PR	EAST	45	1,025.5	850.5	82.9	770.0	1	630.0			630.0
(Nassau grouper)	PR	SOUTH	12	383.3	401.3	104.7	206.5	1	190.0			190.0
	PR	SOUTH						33	1,098.8	516.0	47.0	1,140.0
	PR	WEST	7	1,602.1	1,462.3	91.3	1,024.0					
	STC	--	4	1,087.5	572.1	52.6	1,100.0	6	1,437.5			1,075.0
	StT/StJ	--	73	3,251.0	1,933.8	59.5	2,900.0					
Mycteroperca bonaci	PR	SOUTH						36	3,383.1	2,927.1	86.5	1,882.5
(Black grouper)												
Mycteroperca interstitialis	PR	SOUTH						1	790.0			790.0
(Yellowmouth grouper)	StT/StJ	--	10	1,241.5	637.0	51.3	1,122.5					
Mycteroperca tigris	PR	EAST						1	230.0			230.0
(Tiger grouper)	STC	--	2	2,600.0	2,969.9	114.2	2,600.0					
	StT/StJ	--	24	2,062.7	1,486.3	72.1	1,762.5					

TABLE 5. Comparison of fish weight between 1985 and 1990 (con't)

FAMILY – Family common name / *Species name* (Species common name)	ISLAND*	COAST	1985 WEIGHT IN GRAMS N	MEAN	STD	CV	MEDIAN	1990 WEIGHT IN GRAMS N	MEAN	STD	CV	MEDIAN
Mycteroperca venenosa	PR	EAST	17	1,725.9	1,166.6	67.6	1,355.0	7	4,940.9	2,595.9	52.5	4,536.0
(Yellowfin grouper)	PR	SOUTH	2	703.5	521.1	74.1	703.5	1	790.0	.		790.0
	STC	--	11	1,098.0	1,247.6	113.6	750.0	3	808.3			675.0
	StT/StJ	--	103	3,491.2	2,426.3	69.5	3,100.0					
CARANGIDAE – Jacks												
Caranx lugubris	PR	WEST										
(Black jack)	STC	--	5	1,641.4	943.0	57.5	1,250.0	4	1,400.0			1,075.0
	StT/StJ	--	1	825.0	.	.	825.0					
Caranx barthdomaei	PR	EAST						18	400.6	134.9	33.7	397.5
(Yellow jack)	PR	SOUTH						1	1,340.0	.		1,340.0
	PR	WEST						20	2,000.1	3,932.8	196.6	635.0
	STC	--	10	1,016.5	234.9	23.1	1,017.0					
	StT/StJ	--	5	325.0	82.9	25.5	350.0					
Caranx crysos	PR	EAST	21	234.9	114.7	48.8	198.0	95	938.2	488.8	52.1	900.0
(Blue runner)	PR	NORTH						5	786.0	335.4	42.7	735.0
	PR	WEST						0	.	.		
	STC	--	19	525.5	321.3	61.1	355.0					
	StT/StJ	--	15	1,131.0	467.6	41.3	910.0					
Caranx hippos	PR	NORTH						22	853.7	1,629.7	190.9	280.0
(Crevalle jack)	PR	WEST						1	3,515.0	.		3,515.0
Caranx latus	PR	EAST						3	2,834.7	907.5	32.0	2,835.0
(Horse–eye jack)	PR	NORTH						39	212.7	224.9	105.7	114.0
	PR	WEST						69	547.9	641.1	117.0	410.0
	STC	--	6	2,192.0	816.7	37.3	2,212.0					
	StT/StJ	--	6	1,437.5	454.4	31.6	1,300.0					
Caranx ruber	PR	EAST						43	445.0	200.8	45.1	375.0
(Bar jack)	PR	NORTH						4	381.3	221.1	58.0	355.0
	PR	SOUTH						50	282.7	97.6	34.5	252.5
	PR	WEST						129	328.8	230.8	70.2	305.0
	STC	--	98	238.7	159.8	67.0	198.0	6	554.0			487.5
	StT/StJ	--	32	625.0	1,084.2	173.5	400.0	1	400.0	.		400.0
Caranx spe.	StT/StJ	--	3	975.0	1,064.5	109.2						
(Unidentified jack)												
LUTJANIDAE – Snappers												
Apsilis dentatus	PR	NORTH	1	1,975.0	.	.	1,975.0					
(Black snapper)								49	868.4			700.0
Etelis oculatus	PR	NORTH						7	1,577.0	1,219.5	77.3	1,406.0
(Queen snapper)	PR	SOUTH	1	119.0	.	.	119.0					
	PR	WEST						108	696.6	6,117.6	293.9	382.5
	STC	--	48	878.0	752.2	85.7	690.0	150	1,068.4			762.5
	StT/StJ	--	21	3,191.6	2,057.3	64.5	2,840.0					
Lutjanus analis	PR	EAST	30	1,444.3	1,461.6	101.2	561.0	81	2,081.4	1,426.8	65.3	420.0
(Mutton snapper)	PR	NORTH	7	4,177.7	2,812.4	67.3	4,352.0	8	2,185.4	975.6	157.3	2,159.5
	PR	SOUTH	10	1,220.0	1,090.7	89.4	980.5	34	620.1	797.1	214.8	370.0
	PR	WEST	6	2,221.7	1,484.3	66.8	1,857.0	146	371.1	1,002.0	101.3	135.0
	STC	--	17	1,431.4	1,338.5	93.5	936.0	5	2,860.0			2,800.0
	StT/StJ	--	27	1,483.7	1,343.4	90.5	850.0					
Lutjanus apodus	PR	EAST	19	594.9	517.7	87.0	367.0	60	989.2	769.3	121.0	694.0
(Schoolmaster)	PR	NORTH	19	977.1	574.3	58.8	1,048.0	2	636.0	284.9	73.0	636.0
	PR	SOUTH	26	337.9	128.8	38.1	300.0	50	390.4	251.4	59.6	282.5
	PR	WEST	8	248.0	120.4	48.5	206.0	82	421.7	300.5	61.7	350.0
	STC	--	101	477.7	277.0	58.0	425.0	47	508.0			450.0
	StT/StJ	--	39	607.7	384.2	63.2	500.0	2	487.5	317.0	71.0	487.5
Lutjanus buccanella	PR	EAST	18	247.1	153.8	62.2	209.0	44	446.5	245.2	107.0	351.5
(Blackfin snapper)	PR	NORTH	2	126.5	43.1	34.1	126.5	44	229.1	198.3	45.3	177.5
	PR	WEST						8	437.5	2,022.9	63.0	407.5
	STC	--	65	421.3	222.1	52.7	369.0	223	566.3			500.0
	StT/StJ	--	180	486.2	214.8	44.2	450.0					
Lutjanus campechanus	PR	NORTH	1	330.0	.	.	330.0					
(Red snapper)	StT/StJ	--	1	910.0	.	.	910.0					
Lutjanus cyanopterus	PR	EAST						3	3,209.7	7,805.8	134.1	3,629.0
(Cubera snapper)	PR	WEST						2	5,819.5	1,314.8	116.4	5,819.0
	STC	--	4	243.8	12.5	5.1	250.0					
Lutjanus griseus	PR	EAST	4	174.3	51.7	29.7	162.0	6	1,129.8			515.0

TABLE 5. Comparison of fish weight between 1985 and 1990 (con't)

FAMILY – Family common name / *Species name* (Species common name)	ISLAND*	COAST	1985 WEIGHT IN GRAMS N	MEAN	STD	CV	MEDIAN	1990 WEIGHT IN GRAMS N	MEAN	STD	CV	MEDIAN
(Gray snapper)	PR	NORTH	4	249.5	87.9	35.2	242.5					
	PR	SOUTH						2	305.0	35.4	11.6	305.0
	PR	WEST						0	.	.		
	StT/StJ	--	1	8,050.0	.	.	8,050.0					
Lutjanus jocu	PR	EAST	4	2,674.5	2,766.7	103.5	2,386.5					
(Dog snapper)	PR	NORTH	9	644.6	364.0	56.5	572.0	3	758.3	755.6	99.6	255.0
	PR	SOUTH	6	249.8	90.3	36.1	275.0	34	1,114.6	1,055.1	94.7	827.5
	PR	WEST						1	415.0	.		415.0
	STC	--	3	669.7	402.3	60.1	450.0					
	StT/StJ	--	16	2,554.7	1,493.8	58.5	2,525.0	1	525.0	.		525.0
Lutjanus mahogoni	PR	EAST	10	623.2	271.1	43.5	575.5					
(Mahogany snapper)	PR	NORTH	7	482.3	91.7	19.0	448.0	2	280.0	212.1	75.8	280.0
	PR	SOUTH	9	198.1	56.8	28.7	170.0					
	STC	--	12	190.8	56.8	29.8	175.0	7	260.7			250.0
	StT/StJ	--	12	275.0	75.4	27.4	275.0					
Lutjanus spe.	PR	NORTH						1	150.0	.		150.0
(Unidentified snapper)	PR	WEST										
Lutjanus synagris	PR	EAST	208	183.8	139.9	76.1	160.5	309	241.4	103.5	42.9	225.0
(Lane snapper)	PR	NORTH	10	298.9	175.1	58.6	252.5	120	240.0	105.4	43.9	212.5
	PR	SOUTH	102	160.3	89.1	55.6	143.0	237	144.2	90.0	62.4	116.0
	PR	WEST	109	179.2	77.4	43.2	168.0	1328	208.1	97.9	47.0	190.0
	STC	--	4	212.5	62.9	29.6	200.0	8	281.3			300.0
	StT/StJ	--	103	329.4	198.4	60.2	300.0	7	267.9	68.8	25.7	
Lutjanus vivanus	PR	EAST	18	536.3	309.7	57.7	420.5	223	456.5	916.5	200.8	330.0
(Silk snapper)	PR	NORTH	159	223.6	172.0	77.0	176.0	334	290.7	204.4	70.3	230.0
	PR	SOUTH	3	279.0	176.9	63.4	204.0					
	PR	WEST	1	39.0	.	.	39.0	13	382.3	262.2	68.6	420.0
	STC	--	165	994.3	589.6	59.3	879.0	378	770.9			600.0
	StT/StJ	--	36	711.5	1,094.2	153.8	200.0	4	275.0	35.4	12.9	
Ocyurus chrysurus	PR	EAST	521	442.7	279.3	63.1	389.0	854	415.0	1,802.1	434.3	292.5
(Yellowtail snapper)	PR	NORTH	402	392.9	142.2	36.2	370.0	115	496.9	200.9	40.4	430.0
	PR	SOUTH	43	253.6	126.1	49.7	260.0	270	238.9	131.0	54.8	210.0
	PR	WEST	30	223.1	105.9	47.5	193.0	370	254.3	129.8	51.0	225.0
	STC	--	610	384.8	342.1	88.9	284.0	32	432.0			425.0
	StT/StJ	--	456	705.1	384.9	54.6	565.0	1	300.0	.		300.0
Rhomboplites aurorubens	PR	EAST	58	153.5	33.9	22.1	148.5	443	191.5	112.6	58.8	170.0
(Vermilion snapper)	PR	NORTH	104	133.2	62.8	47.2	117.0	280	130.6	52.2	40.0	120.0
	PR	SOUTH						40	154.6	103.2	66.8	124.0
	STC	--	14	751.3	178.9	23.8	737.0	76	422.7			400.0
	StT/StJ	--	6	143.3	82.0	57.2	125.0					
HAEMULIDAE – Grunts												
Anisotremus surinamensis	PR	EAST						20	431.9	253.1	58.6	352.5
(Black margate)	PR	WEST						1	350.0	.		350.0
	StT/StJ	--	2	775.0	247.5	31.9	775.0					
Anisotremus virginicus	PR	EAST						32	273.0	94.9	34.8	275.0
(Porkfish)	PR	SOUTH	2	326.5	186.0	57.0	326.5	27	215.3	73.2	34.0	210.0
	PR	WEST						38	305.0	92.7	30.4	290.0
	STC	--	13	315.0	114.0	36.2	300.0					
	StT/StJ	--	8	743.8	362.7	48.8	737.5					
Conodon nobilis	PR	EAST						53	287.6	63.5	22.1	285.0
(Barred grunt)												
Haemulon album	PR	EAST	19	643.0	749.3	116.5	287.0	8	553.8	582.5	105.2	340.0
(Margate)	PR	SOUTH	2	211.0	93.3	44.2	211.0					
	STC	--	3	2,291.7	2,041.2	89.1	1,550.0					
	StT/StJ	--	21	2,580.2	986.1	38.2	2,636.0					
Haemulon aurolineatum	PR	EAST	12	216.4	62.3	28.8	204.5	6	76.3	15.3	20.0	73.0
(Tomtate)	PR	NORTH						23	78.7	36.1	45.8	66.0
	PR	SOUTH	5	215.0	35.9	16.7	228.0					
	PR	WEST						1	90.0	.		90.0
	StT/StJ	--	20	218.8	71.1	32.5	200.0					
Haemulon bonariense	PR	EAST	1	201.0			201.0					
(Black grunt)	PR	SOUTH						1	150.0	.		150.0
	PR	WEST						2	530.0	141.4	26.7	530.0

TABLE 5. Comparison of fish weight between 1985 and 1990 (con't)

FAMILY – Family common name / *Species name* (Species common name)	ISLAND*	COAST	1985 WEIGHT IN GRAMS N	MEAN	STD	CV	MEDIAN	1990 WEIGHT IN GRAMS N	MEAN	STD	CV	MEDIAN
Haemulon carbonarium	PR	EAST						14	268.6	110.7	41.2	223.0
(Caesar grunt)	PR	WEST						4	198.8	41.1	20.7	180.0
	STC	--	31	193.1	35.3	18.3	198.0	79	231.7			225.0
Haemulon chrysargyreum	PR	WEST						3	67.3	8.3	12.4	70.0
(Smallmouth grunt)												
Haemulon flavolineatum	PR	EAST	82	215.0	115.0	53.5	212.0	9	152.9	38.2	25.0	150.0
(French grunt)	PR	SOUTH	57	128.0	98.3	76.8	115.0	16	126.3	16.2	12.9	130.0
	PR	WEST	69	125.4	35.9	28.6	121.0	21	115.6	69.7	60.3	104.0
	STC	--	232	158.8	47.2	29.7	150.0	8	162.5			150.0
	StT/StJ	--	12	179.2	33.4	18.7	200.0	23	179.4	59.7	33.3	150.0
Haemulon macrostomum	PR	EAST	15	248.7	118.0	47.4	214.0	46	230.5	114.2	49.6	199.0
(Spanish grunt)	PR	NORTH	4	196.0	36.9	18.8	196.0					
	PR	SOUTH	28	244.9	131.8	53.8						
	PR	SOUTH	15	156.5	57.3	36.6	135.0					
	PR	WEST						2	550.0	332.3	60.4	550.0
	StT/StJ	--	6	783.3	113.7	14.5	750.0	15	198.3	41.7	21.0	550.0
Haemulon melanurum	PR	EAST	1	185.0	.	.	185.0					
(Cottonwick)	PR	SOUTH	1	241.0	.	.	241.0					
	STC	--	1	170.0	.	.	170.0					
	StT/StJ	--	12	250.0	63.1	25.2	170.0					
Haemulon parrai	PR	EAST	7	317.1	55.5	17.5	225.0	65	236.2	70.3	29.8	231.0
(Sailor's choice)	StT/StJ	--						2	350.0	70.7	20.2	550.0
Haemulon plumieri	PR	EAST	530	206.5	84.4	40.9	197.5	996	254.2	91.3	35.9	245.0
(White grunt)	PR	NORTH	57	329.6	81.7	24.8	326.0	15	257.0	47.9	18.6	240.0
	PR	SOUTH	320	188.4	75.6	40.1	181.5	613	180.8	71.3	39.4	175.0
	PR	WEST	186	203.6	111.4	54.7	177.0	970	201.0	91.3	45.4	195.0
	STC	--	1,588	236.7	62.2	26.3	225.0	309	272.2			250.0
	StT/StJ	--	39	633.7	1,042.9	164.6	475.0	55	308.2	99.2	32.2	250.0
Haemulon sciurus	PR	EAST	36	222.3	81.5	36.7	197.5	172	246.9	98.1	39.7	235.0
(Bluestriped grunt)	PR	NORTH						1	390.0	.		390.0
	PR	SOUTH	88	215.4	84.8	39.4	212.5	71	170.8	73.8	30.2	180.0
	PR	WEST	17	235.8	101.8	43.2	177.0	93	231.6	82.8	27.7	190.0
	STC	--	138	289.6	75.5	26.1	300.0					
	StT/StJ	--	23	331.5	123.2	37.2	300.0	48	299.0	78.8	29.7	
Haemulon sp.	PR	NORTH	1	384.0	.	.	384.0					
(Unidentified grunt)	PR	SOUTH						1	230.0	.		230.0
Pomadasys crocro	PR	NORTH						1	170.0	.		170.0
(Burro grunt)								5	665.0			725.0
SPARIDAE – Porgies												
Archosargus rhomboidalis	PR	EAST						1	110.0	.		110.0
(Sea bream)	PR	SOUTH						4	148.3	44.6	30.1	120.0
	PR	WEST										
	StT/StJ	--	7	232.1	31.3	13.5	250.0					
Calamus bajonado	PR	EAST	99	255.6	94.3	36.9	216.0	5	343.6	315.6	91.9	190.0
(Jolthead porgy)	PR	SOUTH	15	287.5	155.5	54.1	222.0	271	193.2	101.6	52.6	165.0
	PR	WEST						228	175.7	97.6	55.6	152.5
	StT/StJ	--						122	294.3	117.4	39.9	
Calamus penna	PR	EAST	480	224.0	139.5	62.3	204.0	16	189.6	57.1	30.1	165.0
(Sheepshead porgy)	PR	NORTH						2	157.5	10.6	6.7	157.5
	PR	SOUTH	82	215.4	108.4	50.3	170.5	23	192.9	98.8	51.2	165.0
	PR	WEST	65	148.7	69.6	46.8	124.0	69	167.9	100.3	59.8	130.0
MULLIDAE – Goatfishes												
Mulloidichthys martinicus	PR	EAST	10	243.5	114.1	46.9	194.0	8	84.0	22.1	135.0	83.0
(Yellow goatfish)	PR	NORTH						3	126.7	14.4	11.4	135.0
	PR	SOUTH	49	177.6	74.4	41.9	163.0	33	171.2	71.3	41.7	150.0
	PR	WEST	31	186.6	65.3	35.0	158.0	64	117.4	61.9	52.8	94.0
	STC	--	547	184.9	44.3	23.9	175.0					
	StT/StJ	--	22	307.1	95.8	31.2	287.5	26	339.4	66.4	19.6	350.0
	StT/StJ	--	2	650.0	70.7	10.9	650.0					
Pseudupeneus maculatus	PR	EAST	871	134.8	66.0	49.0	141.0	108	116.0	45.9	39.6	108.0
(Spotted goatfish)	PR	SOUTH	190	131.4	42.6	32.4	123.5	21	157.1	54.2	51.8	170.0
	PR	WEST	204	134.1	50.5	37.6	131.0	339	104.7	28.9	12.4	100.0
	STC	--	125	181.0	47.8	26.4	170.0					

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	StT/StJ	--	3	230	121.2	52.7	250.0	3	233.3	515.0	83.5	
EPHIPPIDAE – Spadefishes												
Chaetodipterus faber	PR	WEST						1	690.0	.		690.0
(Atlantic spadefish)	STC	--	1	975.0	.	.	975.0					
CHAETODONTIDAE – Butterflyfishes												
Chaetodon ocellatus	StT/StJ	--	2	75.0	0.0	0.0	75.0					
(Spotfin butterflyfish)												
POMACANTHIDAE – Angelfishes												
Holacanthus ciliaris	STC	--	9	697.2	310.6	44.6		35	535.0			500.0
(Queen angelfish)	StT/StJ	--	14	698.2	308.1	44.1		3	616.7			550.0
Holacanthus tricolor	STC	--	31	296.4	63.0	21.3	300.0					
(Rock beauty)	StT/StJ	--	6	245.8	29.2	11.9	250.0	1	200.0	.		200.0
Pomacanthus arcuatus	PR	WEST						1	1,370.0	.		1,370.0
(Gray angelfish)	STC	--	17	1,123.5	641.4	57.1	900.0					
	StT/StJ	--	82	1,064.0	514.9	48.4	930.0	3	258.3	80.4	31.1	263.0
Pomacanthus paru	STC	--	13	757.5	450.3	59.4	500.0	9	641.7			500.0
(French angelfish)	StT/StJ	--	17	979.4	679.0	69.3	1,025.0	2	237.5	17.7	7.4	237.5
LABRIDAE – Wrasses												
Bodianus rufus	PR	SOUTH						6	345.0	44.3	12.8	340.0
(Spanish hogfish)	PR	WEST						2	397.5	109.6	27.6	397.5
	STC	--	15	291.7	96.9	33.2	255.0	3	375.0			375.0
	StT/StJ	--	12	348.3	90.4	26.0	355.0					
Halichoeres radiatus	PR	EAST	1	201.0	.	.	201.0	1	300.0	.		300.0
(Puddingwife)	PR	SOUTH	1	382.0	.	.	382.0					
	STC	--	5	494.0	217.9	44.1	600.0					
	StT/StJ	--	3	426.7	219.4	51.4	300.0					
Lachnolaimus maximus	PR	EAST	17	794.2	501.1	63.1	547.0	7	2,196.9	1,633.4	74.4	1,070.0
(Hogfish)	PR	SOUTH	19	966.7	955.3	98.8	502.0	174	1,235.8	1,223.6	99.0	1,057.5
	PR	WEST	17	1,227.0	1,119.6	91.2	530.0	21	480.5	370.7	77.2	405.0
	STC	--	3	816.7	246.6	30.2	700.0					
	StT/StJ	--	27	2,808.7	1,697.9	60.5	2,490.0	2	775.0	530.3	68.4	530.3
SCARIDAE – Parrotfishes												
Scarus coelestinus	PR	SOUTH						2	3,616.5	2,583.1	71.4	3,616.5
(Midnight parrotfish)												
Scarus coerelus	PR	NORTH						24	204.0	41.0	20.1	190.0
(Blue parrotfish)												
Scarus guacamaia	PR	SOUTH						5	2,715.2	1,468.8	54.1	1,725.0
(Rainbow parrotfish)	StT/StJ	--	3	5,006.7	1,058.0	21.1	4,475.0					
Scarus spe.	PR	EAST						2	367.5	201.5	54.8	367.5
(Unidentified parrotfish)	StT/StJ	--	1	250.0			250.0					
Scarus taeniopterus	PR	EAST						1	345.0	.		345.0
(Princess parrotfish)	PR	SOUTH						50	282.1	116.1	41.2	260.0
	PR	WEST						13	320.8	124.5	38.8	265.0
	STC	--	167	330.5	75.3	22.8	312.0	36	339.6			350.0
	StT/StJ	--	29	302.8	80.1	26.5	275.0	7	182.1	102.8	56.4	375.0
Scarus vetula	PR	EAST						5	378.0	51.3	13.6	370.0
(Queen parrotfish)	PR	SOUTH						16	451.9	163.8	36.3	380.0
	PR	WEST						63	512.5	197.2	38.5	505.0
	STC	--	10	762.9	186.7	24.5	750.0	32	699.2			637.5
	StT/StJ	--	1	1,175.0			1,175.0					
Sparisoma aurofrenatum	PR	SOUTH						15	193.7	23.5	12.1	195.0
(Redband parrotfish)	PR	WEST						37	253.0	104.0	41.1	210.0
	StT/StJ	--						1	225.0	.		225.0
	STC	--	217	217.4	42.9	19.7	200.0	6	300.0			225.0
	StT/StJ	--	25	251.0	122.4	48.8	200.0					
Sparisoma chrysopterum	PR	EAST						189	362.4	95.0	32.4	350.0
(Redtail parrotfish)	PR	SOUTH						182	292.7	104.0	30.0	292.5
	PR	WEST						345	346.9	106.9	40.1	360.0
	STC	--	1,862	367.2	85.5	23.3	369.0	718	373.9			375.0
	StT/StJ	--	93	437.7	147.5	33.7	450.0	6	266.7	99.7	38.7	275.0

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Sparisoma rubripinne	PR	EAST						13	312.0	125.4	40.2	245.0
(Redfin parrotfish)	PR	WEST						1	245.0	.		245.0
	StT/StJ	--						2	500.0	141.4	28.3	500.0
Sparisoma spe.	PR	EAST						255	293.5	139.0	47.4	255.0
(Unidentified parrotfish)	PR	SOUTH						3	281.7	185.0	65.7	185.0
	PR	WEST						15	322.7	103.2	32.0	330.0
	STC	--	3	340.7	49.1	14.4	369.0					
	StT/StJ	--	190	422.9	263.4	62.3	387.5					
Sparisoma viride	PR	EAST						107	473.3	175.6	37.1	454.0
(Stoplight parrotfish)	PR	SOUTH	1	113.0	162.1	40.0	113.0	154	362.1	149.4	41.3	330.0
	PR	WEST						518	455.3	164.8	36.2	425.0
	STC	--	1,693	513.6	174.2	33.9	500.0	819	460.1			425.0
	StT/StJ	--	53	677.0	366.6	54.2	575.0	16	412.5	217.4	52.7	550.0
ACANTHURIDAE – Surgeonfishes												
Acanthurus bahianus	STC	--	355	187.8	37.4	19.9	198.0	112	188.6			200.0
(Ocean surgeon)	StT/StJ	--	55	191.3	101.3	53.0	160.0					
Acanthurus chirurgus	STC	--	227	316.3	78.5	24.8	325.0	605	168.6			150.0
(Doctorfish)	StT/StJ	--	139	364.5	128.6	35.3	350.0	13	265.4	59.1	22.3	325.0
Acanthurus coeruleus	STC	--	2,063	206.2	56.6	27.5	200.0					
(Blue tang)	StT/StJ	--	410	248.9	103.5	41.6	225.0	65	191.5	80.8	42.2	225.0
Acanthurus spe.	STC	--	192	177.9	36.4	20.5	175.0					
(Unidentified Acanthurid)												
BALISTIDAE – Leatherjackets												
Balistes spe.	PR	EAST						1	425.0	.		425.0
(Unidentified triggerfish)												
Balistes vetula	PR	EAST	88	769.8	405.0	52.6	677.0	37	668.7	288.1	43.1	620.0
(Queen triggerfish)	PR	NORTH	3	689.3	148.8	21.6	646.0	0	.	.		
	PR	SOUTH	165	416.4	246.6	59.2	363.0	32	451.3	260.9	57.8	395.0
	PR	WEST	86	704.4	378.0	53.7	611.0	56	454.6	267.3	58.8	397.5
	STC	--	815	632.3	327.1	51.7	525.0	105	544.1			525.0
	StT/StJ	--	509	844.8	372.3	44.1	800.0	43	529.7	326.3	61.6	550.0
Canthidermis sufflamen	STC	--	13	1,199.8	258.5	21.6	1,200.0					
(Ocean triggerfish)	STC	--	1	525.0	.	.	525.0					
	StT/StJ	--	3	858.3	144.3	16.8	775.0					
OSTRACIIDAE – Boxfishes												
Lactophrys bicaudalis	PR	EAST	15	157.6	61.5	39.0	144.0	1	290.0	.		290.0
(Spotted trunkfish)	PR	EAST	14	1,135.4	1,002.6	88.3						
	PR	SOUTH	53	208.0	177.4	85.3	162.0	9	180.3	50.8	28.2	170.0
	PR	WEST	11	254.8	159.1	62.5	211.0	9	264.1	238.3	90.2	205.0
	STC	--	12	175.7	35.0	19.9	172.5	10	255.0			175.0
	StT/StJ	--	1	115.0	.	.	115.0	5	345.0	106.7	30.9	1,137.0
Lactophrys polygonia	PR	EAST	90	219.8	110.6	50.3	191.0	56	258.9	184.8	71.4	210.0
(Honeycomb cowfish)	PR	SOUTH	77	219.8	130.8	59.5	191.0	47	223.2	139.4	62.5	205.0
	PR	WEST	36	433.0	182.0	42.0	399.5	19	148.6	47.4	31.9	140.0
	STC	--	199	309.4	120.4	38.9	300.0	394	330.1			325.0
	StT/StJ	--						82	251.5	157.8	62.7	350.0
Lactophrys quadricornis	PR	EAST	73	143.7	64.4	44.8	130.0	27	173.6	182.8	105.3	125.0
(Scrawled cowfish)	PR	SOUTH	97	187.4	119.4	63.7	150.0	13	208.0	78.5	37.7	195.0
	PR	WEST	49	172.2	64.6	37.5	167.0	8	256.8	111.3	43.4	255.0
	STC	--	9	339.8	147.6	43.5	340.0	15	376.7			400.0
	StT/StJ	--						1	225.0	.	.	225.0
Lactophrys trigonius	PR	EAST	12	502.0	324.7	64.7	607.5	3	836.7	170.1	20.3	830.0
(Trunkfish)	PR	SOUTH	5	595.2	144.7	24.3	537.0	3	265.0	225.2	85.0	135.0
	PR	WEST						18	554.2	369.3	66.6	675.0
	STC	--	2	362.5	371.2	102.4	362.5					
Lactophrys triqueter	PR	EAST	18	143.2	86.2	60.2	110.0	13	157.1	33.7	21.5	165.0
(Smooth trunkfish)	PR	SOUTH	22	171.6	87.6	51.1	149.0	7	161.6	45.7	28.3	185.0
	PR	WEST	9	161.7	91.8	56.8	137.0	5	721.2	566.8	78.6	610.0
	STC	--	19	177.5	39.3	22.1	175.0	59	181.0			175.0
	StT/StJ	--						9	225.0	75.0	33.3	175.0

TABLE 5. Comparison of fish weight between 1985 and 1990 (con't)

FAMILY – Family common name *Species name* (Species common name)	ISLAND*	COAST	1985 WEIGHT IN GRAMS N	MEAN	STD	CV	MEDIAN	1990 WEIGHT IN GRAMS N	MEAN	STD	CV	MEDIAN
MISCELLANEOUS – Multiple species												
Uncategorized fish	PR	EAST	213	177.6	485.3	273.2						
(Multiple species)	STC	--	9	2,981.8	3,769.0	126.4						
	StT/StJ	--	4	1,475.0	1,090.5	73.9						
	StT/StJ	--	1	7,450.0								
	TOTAL =		**26,338**					**20,197**				

* ISLAND CODES
PR – Puerto Rico
StC – St. Croix
StT/StJ – St. Thomas and St. John

TABLE 6. Summary of fish length and weight by gear type for 1985 data

FAMILY – Family common name / *Species name* (Species common name)	GEAR	1985 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN	1985 (WEIGHT IN GRAMS) N	MEAN	STD	CV	MEDIAN
HOLOCENTRIDAE – Squirrelfishes											
Holocentrus ascensionis	HOOK & LINE	24	200.5	13.7	6.8	205.0	24	141.3	39.0	27.6	125.0
(Squirrelfish)	TRAPS	252	209.6	21.2	10.1	210.0	252	231.6	399.6	172.6	200.0
	TRAPS & HOOKS	10	226.5	22.9	10.1	225.0	10	227.5	76.8	33.8	212.5
Holocentrus spe.	TRAPS	30	225.5	22.4	9.9	227.5	30	221.0	57.9	26.2	200.0
(Unidentified squirrelfish)											
SERRANIDAE – Sea basses											
Epinephelus adscensionis	HOOK & LINE	2	397.5	102.5	25.8	397.0	2	1,037.5	689.4	66.5	1,037.5
(Rock hind)	TRAPS	15	268.2	88.6	33.0	250.0	15	406.0	565.8	139.4	188.0
	TRAPS & HOOKS	2	363.5	37.5	10.3	363.5	2	975.0	247.5	25.4	975.0
Epinephelus afer	HOOK & LINE	1	282.0	.	.	282.0	1	346.0	.	.	346.0
(Mutton hamlet)	TRAPS	6	250.8	28.0	11.1	247.5	6	246.8	103.8	42.1	224.5
	UNKNOWN	2	252.0	18.4	7.3	252.0	2	266.5	51.6	19.4	266.5
Epinephelus cruentatus	HOOK & LINE	6	216.0	17.3	8.0	221.0	6	145.8	45.9	31.5	150.0
(Graysby)	TRAPS	5	312.6	101.6	32.5	270.0	5	664.8	708.0	106.5	425.0
	TRAPS & HOOKS	2	273.0	21.2	7.8	273.0	2	312.5	123.7	39.6	312.5
Epinephelus flavolimbatus	OTHER GEAR	1	715.0	.	.	715.0	1	5,100.0	.	.	5,100.0
Epinephelus flavolimbatus	TRAPS & HOOKS	1	930.0	.	.	930.0	1	9,999.0	.	.	9,999.0
(Yellowedge grouper)											
Epinephelus fulvus	HOOK & LINE	243	223.2	21.1	9.5	221.0	243	187.2	59.2	31.6	175.0
(Coney)	OTHER GEAR	2	249.0	9.9	4.0	249.0	2	302.5	54.5	18.0	302.5
	TRAPS	2,034	232.4	26.8	11.5	230.0	2,034	215.6	152.7	70.9	200.0
	TRAPS & HOOKS	73	231.9	19.3	8.3	230.0	73	214.1	72.8	34.0	200.0
	UNKNOWN	73	241.8	27.6	11.4	238.0	73	243.2	126.6	52.1	207.0
Epinephelus guttatus	HOOK & LINE	495	307.1	54.6	17.8	299.0	495	505.2	338.4	67.0	397.0
(Red hind)	OTHER GEAR	29	315.9	47.1	14.9	268.0	29	516.8	299.3	57.9	446.0
	TRAPS	1,041	298.8	61.0	20.4	285.0	1,041	453.6	337.0	74.3	330.0
	TRAPS & HOOKS	71	330.3	57.1	17.3	330.0	71	623.6	391.1	62.7	500.0
	UNKNOWN	111	277.1	42.4	15.3	310.0	111	358.7	252.9	70.5	283.0
Epinephelus itajara	TRAPS	3	331.0	102.2	30.9	313.0	3	751.0	742.9	98.9	472.0
(Jewfish)											
Epinephelus morio	TRAPS	9	526.9	108.7	20.6	550.0	9	2,444.9	1,455.2	59.5	2,750.0
(Red grouper)	TRAPS & HOOKS	3	583.3	77.8	13.3	575.0	3	3,583.3	1,682.5	47.0	34,000.0
	UNKNOWN	1	356.0	.	.	356.0	1	682.0	.	.	682.0
Epinephelus mystacinus	HOOK & LINE	7	628.0	243.4	38.8	665.0	7	4,688.4	4,052.3	86.4	4,500.0
(Misty grouper)	OTHER GEAR	2	894.5	147.8	16.5	894.5	2	9,999.0	0.0	0.0	9,999.0
	TRAPS & HOOKS	1	999.0	.	.	999.0	1	9,999.0	.	.	9,999.0
	HOOK & LINE	11	277.7	87.3	31.5	250.0	11	543.1	1,020.7	187.9	193.0
Epinephelus striatus	OTHER GEAR	1	400.0	.	.	400.0	1	961.0	.	.	961.0
(Nassau grouper)	TRAPS	116	474.6	128.3	27.0	475.0	116	2,171.2	1,875.0	86.4	1,700.0
	TRAPS & HOOKS	11	573.6	93.1	16.2	560.0	11	3,622.3	1,860.2	51.4	3,200.0
	UNKNOWN	2	446.5	26.2	5.9	446.5	2	2,501.5	1,690.7	67.6	2,501.5
Mycteroperca interstitialis	HOOK & LINE	1	312.0	.	.	312.0	1	438.0	.	.	438.0
(Yellowmouth grouper)	TRAPS	6	434.2	69.9	16.1	420.0	6	1,300.0	661.8	50.9	112.5
	TRAPS & HOOKS	4	403.8	84.7	21.0	392.5	4	1,153.8	685.7	59.4	1,162.5
Mycteroperca tigris	TRAPS	24	496.5	106.4	21.4	480.0	24	2,212.7	1,564.5	70.7	1,850.0
(Tiger grouper)	TRAPS & HOOKS	2	362.5	53.0	14.6	362.5	2	800.0	424.3	53.0	800.0
Mycteroperca venenosa	HOOK & LINE	3	216.7	11.6	5.3		3	141.7	14.4	10.2	
(Yellowfin grouper)	HOOK & LINE	27	624.4	104.1	16.7	635.0	27	4,787.0	2,118.0	44.2	4,475.0
	TRAPS	99	492.5	135.5	27.5	480.0	99	2,463.4	2,098.4	85.2	1,626.0
	TRAPS & HOOKS	5	669.0	178.7	26.7	710.0	5	5,299.8	3,313.4	62.5	5,700.0
	UNKNOWN	2	370.0	205.1	55.4	370.0	2	1,393.0	1,568.4	112.6	1,393.0
CARANGIDAE – Jacks											
Caranx lugubris	HOOK & LINE	3	454.7	84.7	18.6	426.0	3	2,036.7	1,073.8	52.7	1,600.0
(Black jack)	TRAPS & HOOKS	2	374.0	33.9	9.1	374.0	2	1,048.5	280.7	26.8	1,048.5
	UNKNOWN	1	480.0	.	.	480.0	1	825.0	.	.	825.0
Caranx bartholomaei	TRAPS	11	331.0	79.4	24.0	330.0	11	687.1	382.9	55.7	680.0
(Yellow jack)	TRAPS & HOOKS	4	375.3	28.8	7.7	376.0	4	1,058.0	287.6	27.2	1,025.0
Caranx crysos	HOOK & LINE	12	366.7	61.4	16.8	373.5	12	1,029.6	367.8	35.7	1,012.5
(Blue runner)	TRAPS	43	262.4	78.4	29.9	254.0	43	454.1	428.1	94.3	325.0
Caranx latus	HOOK & LINE	6	479.5	68.5	14.3	492.5	6	2,229.2	807.2	36.2	2,212.5
(Horse–eye jack)	TRAPS	6	412.5	38.3	9.3	402.5	6	1,400.3	388.8	27.8	1,300.0

TABLE 6. Summary of fish length and weight by gear type for 1985 data (con't)

FAMILY – Family common name / *Species name* (Species common name)	GEAR	1985 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN	1985 (WEIGHT IN GRAMS) N	MEAN	STD	CV	MEDIAN
Caranx ruber	HOOK & LINE	2	565.0	233.4	41.3	565.0	2	3,712.5	3,800.7	102.4	3,712.5
(Bar jack)	TRAPS	114	241.9	48.1	19.9	230.0	114	262.1	179.3	68.4	196.0
	TRAPS & HOOKS	13	282.9	29.8	10.5	283.0	13	375.9	144.6	38.5	350.0
	UNKNOWN	1	430.0	.	.	430.0	1	1,200.0	.	.	1,200.0
Caranx spe.	TRAPS	3	333.3	135.8	40.7		3	975.0	1,064.5	109.2	
(Unidentified jack)											
LUTJANIDAE – Snappers											
Apsilis dentatus	HOOK & LINE	1	470.0	.	.	470.0	1	1,975.0	.	.	1,975.0
(Black snapper)											
Etelis oculatus	HOOK & LINE	57	423.2	147.0	34.7	385.0	57	1,368.5	1,595.6	116.6	800.0
(Queen snapper)	OTHER GEAR	11	536.8	98.0	18.3	550.0	11	2,254.1	1,260.0	56.8	1,820.0
	TRAPS	1	190.0	.	.	190.0	1	119.0	.	.	119.0
	TRAPS & HOOKS	1	740.0	.	.	740.0	1	6,370.0	.	.	6,370.0
Lutjanus analis	HOOK & LINE	11	504.5	168.2	33.3	370.0	11	2,824.2	2,185.6	77.4	2,412.0
(Mutton snapper)	OTHER GEAR	3	490.7	114.2	23.3	448.0	3	2,413.7	1,873.6	77.6	1,510.0
	TRAPS	74	401.8	121.9	30.3	370.0	74	1,424.9	1,295.0	90.9	832.0
	TRAPS & HOOKS	7	429.9	137.0	31.9	382.0	7	2,045.3	3,059.9	149.6	936.0
	UNKNOWN	2	586.5	5.0	0.8	586.5	2	2,216.5	1,512.5	68.2	2,216.5
Lutjanus apodus	HOOK & LINE	29	348.7	67.0	19.2	364.0	29	944.7	524.2	55.5	1,009.0
(Schoolmaster)	OTHER GEAR	11	249.2	10.2	4.1	250.0	11	284.1	24.6	8.7	290.0
	TRAPS	160	282.9	47.9	16.9	280.0	160	474.5	310.7	65.5	425.0
	TRAPS & HOOKS	9	296.2	52.9	17.8	295.0	9	555.9	378.8	68.1	454.0
	UNKNOWN	3	268.3	70.1	26.1	265.0	3	378.3	253.2	66.9	336.0
Lutjanus buccanella	HOOK & LINE	63	261.4	47.7	18.3	258.0	63	370.4	234.6	63.3	300.0
(Blackfin snapper)	TRAPS	148	305.2	45.5	14.9	306.0	148	488.0	204.6	41.9	455.0
	TRAPS & HOOKS	54	287.2	48.1	16.7	278.0	54	445.1	233.0	52.4	386.0
Lutjanus campechanus	HOOK & LINE	1	270.0	.	.	270.0	1	330.0	.	.	330.0
(Red snapper)	TRAPS	1	380.0	.	.	380.0	1	910.0	.	.	910.0
Lutjanus cyanopterus	HOOK & LINE	4	260.0	10.8	4.2	257.5	4	243.8	12.5	5.1	250.0
(Cubera snapper)											
Lutjanus griseus	OTHER GEAR	4	237.5	27.1	11.4	232.0	4	249.5	87.9	35.2	242.5
(Gray snapper)	TRAPS	5	331.2	251.7	76.0	218.0	5	1,749.4	3,522.4	201.4	169.0
Lutjanus jocu	HOOK & LINE	18	441.1	149.0	33.8	413.0	18	2,034.8	1,896.4	93.2	1,144.0
(Dog snapper)	TRAPS	18	358.3	122.6	34.2	330.0	18	1,103.1	1,153.6	104.6	602.5
	TRAPS & HOOKS	2	450.0	254.6	56.6	450.0	2	2,200.0	2,545.6	115.7	2,200.0
Lutjanus mahogoni	HOOK & LINE	14	331.7	38.5	11.6	329.0	14	598.7	219.6	36.7	568.5
(Mahogany snapper)	TRAPS	36	242.1	34.1	14.1	237.5	36	233.4	100.6	43.1	198.0
	TRAPS & HOOKS	1	258.0	.	.	258.0	1	312.0	.	.	312.0
	HOOK & LINE	38	243.0	35.0	14.4	240.0	38	223.0	106.4	47.7	
Lutjanus synagris	OTHER GEAR	28	274.3	49.9	18.2	272.5	28	380.1	183.8	48.4	359.5
(Lane snapper)	TRAPS	415	225.2	43.4	19.3	218.0	415	197.5	145.6	73.7	167.0
	TRAPS & HOOKS	11	214.3	36.0	16.8	195.0	11	196.6	135.2	68.8	216.0
	UNKNOWN	44	219.7	26.3	12.0	215.0	44	196.7	125.3	63.7	163.0
Lutjanus vivanus	HOOK & LINE	287	286.8	87.2	30.4	265.0	287	507.7	481.3	94.8	320.0
(Silk snapper)	OTHER GEAR	6	532.5	67.4	12.7	537.5	6	2,220.0	805.3	36.3	2,047.5
	TRAPS	25	253.3	106.8	42.2	216.0	25	444.2	959.6	216.0	175.0
	TRAPS & HOOKS	64	379.4	76.8	20.2	363.0	64	1,025.0	719.9	70.2	850.0
Ocyurus chrysurus	HOOK & LINE	1,236	314.5	60.0	19.1	300.0	1,236	549.5	354.1	64.5	450.0
(Yellowtail snapper)	OTHER GEAR	9	254.1	37.3	14.7	255.0	9	265.6	117.2	44.1	241.0
	TRAPS	654	255.5	48.1	18.8	244.0	654	293.9	212.2	72.2	227.0
	TRAPS & HOOKS	138	322.9	52.1	16.1	315.0	138	571.4	262.9	46.0	500.0
	UNKNOWN	25	284.6	44.8	15.8	296.0	25	393.4	178.8	45.5	410.0
Rhomboplites aurorubens	HOOK & LINE	107	201.7	38.6	19.1	195.0	107	150.2	121.5	80.9	122.0
(Vermilion snapper)	TRAPS	60	204.9	17.6	8.6	204.5	60	149.1	37.7	25.3	147.0
	TRAPS & HOOKS	11	355.6	37.0	10.4	350.0	11	747.5	202.3	27.1	680.0
	UNKNOWN	4	232.0	21.4	9.2	232.5	4	223.8	55.1	24.6	221.5
HAEMULIDAE – Grunts											
Anisotremus surinamensis	TRAPS	2	335.0	35.4	10.6	335.0	2	775.0	247.5	31.9	775.0
(Black margate)											
Anisotremus virginicus	TRAPS	17	254.7	69.8	27.4	240.0	17	488.1	341.5	70.0	375.0
(Porkfish)	TRAPS & HOOKS	6	235.3	29.0	12.3	228.5	6	400.0	181.0	45.2	362.5

TABLE 6. Summary of fish length and weight by gear type for 1985 data (con't)

FAMILY – Family common name / *Species name* (Species common name)	GEAR	1985 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN	1985 (WEIGHT IN GRAMS) N	MEAN	STD	CV	MEDIAN
Haemulon album	HOOK & LINE	5	467.6	108.2	23.1	477.0	5	2,347.8	1,468.0	62.5	2,069.0
(Margate)	TRAPS	35	396.2	148.8	37.6	390.0	35	1,596.7	1,345.8	84.3	1,200.0
	TRAPS & HOOKS	1	535.0	.	.	535.0	1	3,300.0	.	.	3,300.0
	UNKNOWN	4	293.3	111.7	38.1	245.0	4	693.5	730.5	105.3	363.5
Haemulon aurolineatum	OTHER GEAR	5	233.8	14.2	6.1	243.0	5	215.0	35.9	16.7	228.0
(Tomtate)	TRAPS	31	225.0	24.0	10.7	225.0	31	219.1	67.7	30.9	201.0
	UNKNOWN	1	207.0	.	.	207.0	1	181.0	.	.	181.0
Haemulon bonariense	TRAPS	1	220.0	.	.	220.0	1	201.0	.	.	201.0
(Black grunt)											
Haemulon carbonarium	TRAPS	30	206.0	14.4	7.0	207.0	30	191.0	33.9	17.8	198.0
(Caesar grunt)	TRAPS & HOOKS	1	226.0	.	.	226.0	1	255.0	.	.	255.0
Haemulon flavolineatum	OTHER GEAR	1	179.0	.	.	179.0	1	125.0	.	.	125.0
(French grunt)	TRAPS	418	191.6	24.4	12.8	190.0	418	163.3	78.2	47.9	150.0
	TRAPS & HOOKS	31	189.9	8.6	4.5	190.0	31	129.8	26.9	20.8	125.0
	UNKNOWN	2	161.5	9.2	5.7	161.5	2	84.5	14.9	17.6	84.5
Haemulon macrostomum	HOOK & LINE	4	206.8	13.4	6.5	206.5	4	196.0	36.9	18.8	196.0
(Spanish grunt)	OTHER GEAR	7	217.3	17.8	8.2	215.0	7	234.4	55.1	23.5	221.0
	TRAPS	28	201.9	42.9	21.2	217.0	28	319.5	271.1	84.8	199.5
	TRAPS	28	231.8	69.3	29.9		28	244.9	131.8	53.8	
	UNKNOWN	1	204.0	.	.	204.0	1	190.0	.	.	190.0
Haemulon melanurum	TRAPS	14	230.8	15.3	6.6	230.0	14	243.6	61.8	25.4	220.5
(Cottonwick)	UNKNOWN	1	210.0	.	.	210.0	1	185.0	.	.	185.0
Haemulon parrai	UNKNOWN	7	252.1	11.1	4.4	210.0	7	317.1	55.5	17.5	309.0
(Sailor's choice)											325.0
Haemulon plumieri	HOOK & LINE	64	251.5	30.8	12.3	250.0	64	326.4	68.4	21.0	228.0
(White grunt)	OTHER GEAR	51	225.7	31.8	14.1	219.0	51	237.6	85.4	35.9	216.0
	TRAPS	2,260	215.4	28.4	13.2	213.0	2,260	227.5	163.7	72.0	200.0
	TRAPS & HOOKS	209	220.0	20.6	9.3	215.0	209	232.0	75.8	32.7	225.0
	UNKNOWN	136	221.1	22.6	10.2	220.5	136	230.9	71.9	31.2	123.5
Haemulon sciurus	HOOK & LINE	2	182.5	17.7	9.7	182.5	2	123.5	29.0	23.5	259.0
(Bluestriped grunt)	OTHER GEAR	26	238.0	23.3	9.8	233.0	26	267.3	71.2	26.6	265.0
	TRAPS	216	228.9	28.4	12.4	230.0	216	264.7	101.3	38.3	255.0
	TRAPS & HOOKS	39	230.4	14.3	6.2	230.0	39	262.7	48.6	18.5	196.0
	UNKNOWN	19	213.8	28.2	13.2	206.0	19	207.1	72.8	35.1	384.0
Haemulon sp.	HOOK & LINE	1	282.0	.	.	282.0	1	384.0	.	.	
(Unidentified grunt)											
SPARIDAE – Porgies											
Archosargus rhomboidalis	TRAPS	7	234.3	11.0	4.7	235.0	7	232.1	31.3	13.5	250.0
(Sea bream)											
Calamus bajonado	TRAPS	44	213.3	32.8	15.4	204.0	44	261.0	110.2	42.2	217.5
(Jolthead porgy)	UNKNOWN	70	211.7	25.7	12.2	201.0	70	259.0	100.8	38.9	219.5
Calamus penna	HOOK & LINE	4	235.5	34.4	14.6	228.0	4	381.3	172.9	45.4	337.5
(Sheepshead porgy)	OTHER GEAR	25	202.9	26.4	13.0	201.0	25	224.4	86.9	38.7	212.0
	TRAPS	545	203.9	30.4	14.9	200.0	545	209.4	115.2	55.0	194.0
	TRAPS & HOOKS	14	257.8	147.6	57.3	165.0	14	389.0	440.3	113.2	130.5
	UNKNOWN	39	199.2	31.8	16.0	192.0	39	208.4	94.4	45.3	178.0
MULLIDAE – Goatfishes											
Mulloidichthys martinicus	OTHER GEAR	1	209.0	.	.	209.0	1	151.0	.	.	151.0
(Yellow goatfish)	TRAPS	648	210.4	19.8	9.4	207.5	648	189.0	56.4	29.9	175.0
	TRAPS & HOOKS	4	238.8	33.0	13.8	242.5	4	266.8	88.8	33.3	287.5
	UNKNOWN	6	215.7	21.3	9.9	215.5	6	188.2	60.3	32.1	193.0
Pseudupeneus maculatus	TRAPS	1,303	199.2	19.1	9.6	199.0	1,303	139.6	61.2	43.8	142.0
(Spotted goatfish)	TRAPS & HOOKS	43	154.0	12.9	8.4	153.0	43	68.6	22.4	32.7	65.0
	UNKNOWN	47	207.7	16.5	7.9	207.0	47	172.5	38.6	22.4	169.0
EPHIPPIDAE – Spadefishes											
Chaetodipterus faber	TRAPS & HOOKS	1	295.0	.	.	295.0	1	975.0	.	.	975.0
(Atlantic spadefish)											
CHAETODONTIDAE – Butterflyfishes											
Chaetodon ocellatus	TRAPS	2	125.0	0.0	0.0	125.0	2	75.0	0.0	0.0	75.0
(Spotfin butterflyfish)											

TABLE 6. Summary of fish length and weight by gear type for 1985 data (con't)

FAMILY – Family common name / *Species name* (Species common name)	GEAR	1985 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN	1985 (WEIGHT IN GRAMS) N	MEAN	STD	CV	MEDIAN
POMACANTHIDAE – Angelfishes											
Holacanthus ciliaris	TRAPS	22	285.7	45.5	15.9	282.5	22	693.2	308.2	44.5	612.5
(Queen anglefish)	TRAPS & HOOKS	1	320.0	.	.	320.0	1	800.0	.	.	800.0
Holacanthus tricolor	TRAPS	35	207.7	13.2	6.4	205.0	35	291.8	61.0	20.9	275.0
(Rock beauty)	TRAPS & HOOKS	2	205.0	7.1	3.5	205.0	2	225.0	35.4	15.7	225.0
Pomacanthus arcuatus	TRAPS	86	308.3	68.3	22.2	310.5	86	1,063.9	547.4	51.5	910.0
(Gray angelfish)	TRAPS & HOOKS	13	317.9	39.7	12.5	310.0	13	1,142.3	463.1	40.5	1,000.0
Pomacanthus paru	TRAPS	28	286.4	71.8	25.1	282.5	28	895.4	603.9	67.5	800.0
(French angelfish)	TRAPS & HOOKS	2	275.5	71.4	25.9	275.5	2	713.5	514.1	72.1	713.5
LABRIDAE – Wrasses											
Bodianus rufus	TRAPS	23	259.2	27.7	10.7	260.0	23	323.0	95.3	29.5	325.0
(Spanish hogfish)	TRAPS & HOOKS	4	244.5	34.5	14.1	244.5	4	281.3	110.6	39.3	275.0
Halichoeres radiatus	HOOK & LINE	2	332.5	7.8	2.3	332.5	2	662.5	53.0	8.0	662.5
(Puddingwife)	TRAPS	8	273.4	37.8	13.8	274.0	8	376.0	180.2	47.9	337.5
Lachnolaimus maximus	HOOK & LINE	4	400.8	17.2	4.3	400.0	4	737.8	299.5	40.6	636.5
(Hogfish)	OTHER GEAR	12	448.3	118.5	26.4	487.5	12	1,966.2	1,112.7	56.6	2,118.0
	TRAPS	61	379.0	130.2	34.4	340.0	61	1,446.9	1,499.2	103.6	750.0
	TRAPS & HOOKS	2	590.0	28.3	4.8	590.0	2	4,110.0	763.7	18.6	4,110.0
	UNKNOWN	4	425.5	152.1	35.7	412.5	4	1,996.3	1,762.4	88.3	1,574.5
SCARIDAE – Parrotfishes											
Scarus guacamaia	OTHER GEAR	1	555.0	.	.	550.0	1	4,320.0	.	.	4,620.0
(Rainbow parrotfish)	TRAPS	2	645.0	49.5	7.7	645.0	2	5,350.0	1,237.4	23.1	5,350.0
Scarus spe.	TRAPS	1	240.0	.	.	240.0	1	250.0	.	.	250.0
(Unidentified parrotfish)											
Scarus taeniopterus	TRAPS	191	255.9	21.1	8.2	255.0	191	328.1	76.4	23.3	312.0
(Princess parrotfish)	TRAPS & HOOKS	5	249.6	14.6	5.8	246.0	5	262.4	44.9	17.1	250.0
Scarus vetula	TRAPS	11	333.8	37.5	11.2	330.0	11	800.4	216.4	27.0	750.0
(Queen parrotfish)											
Sparisoma aurofrenatum	TRAPS	241	217.5	14.4	6.6	218.0	241	221.0	57.1	25.8	200.0
(Redband parrotfish)	TRAPS & HOOKS	1	185.0	.	.	185.0	1	200.0	.	.	200.0
Sparisoma chrysopterum	TRAPS	1,490	263.0	22.3	8.5	264.0	1,490	367.0	90.9	24.8	369.0
(Redtail parrotfish)	TRAPS & HOOKS	465	264.6	18.6	7.0	265.0	465	381.8	89.0	23.3	375.0
Sparisoma spe.	HOOK & LINE	1	220.0	.	.	220.0	1	310.0	.	.	310.0
(Unidentified parrotfish)	TRAPS	172	250.5	47.7	19.0	241.0	172	404.0	218.0	54.0	369.0
	TRAPS & HOOKS	20	250.5	38.9	15.5	240.0	20	578.8	484.0	83.6	425.0
Sparisoma viride	HOOK & LINE	1	275.0	.	.	275.0	1	400.0	.	.	400.0
(Stoplight parrotfish)	TRAPS	1,487	284.9	32.9	11.5	285.0	1,487	519.3	187.0	36.0	500.0
	TRAPS & HOOKS	258	280.6	29.7	10.6	279.5	258	514.0	173.7	33.8	475.0
	UNKNOWN	1	235.0	.	.	235.0	1	225.0	.	.	225.0
ACANTHURIDAE – Surgeonfishes											
Acanthurus bahianus	TRAPS	394	191.0	16.0	8.4	190.0	394	188.6	50.7	26.9	186.5
(Ocean surgeon)	TRAPS & HOOKS	16	188.4	18.3	9.7	190.0	16	179.4	49.3	27.5	198.0
Acanthurus chirurgus	TRAPS	325	239.3	30.2	12.6	240.0	325	334.7	104.2	31.1	340.0
(Doctorfish)	TRAPS & HOOKS	41	238.2	28.2	11.8	245.0	41	333.8	93.9	28.1	340.0
Acanthurus coeruleus	TRAPS	2,213	186.3	20.1	10.8	182.0	2,213	209.9	65.6	31.3	200.0
(Blue tang)	TRAPS & HOOKS	260	196.2	22.0	11.2	190.0	260	242.3	84.5	34.9	225.0
Acanthurus spe.	TRAPS	101	194.7	9.1	4.7	195.0	101	196.1	29.9	15.2	200.0
(Unidentified Acanthurid)	TRAPS & HOOKS	91	189.0	10.6	5.6	188.0	91	157.7	32.2	20.4	150.0
BALISTIDAE – Leatherjackets											
Balistes vetula	HOOK & LINE	66	308.5	42.7	13.8	305.5	66	834.5	380.9	45.7	800.0
(Queen triggerfish)	OTHER GEAR	1	290.0	.	.	290.0	1	628.0	.	.	628.0
	TRAPS	1,509	291.3	53.9	18.5	290.0	1,509	684.6	366.8	53.6	600.0
	TRAPS & HOOKS	85	279.0	44.9	16.1	270.0	85	608.3	286.0	47.0	539.0
	UNKNOWN	5	300.6	52.2	17.4	310.0	5	791.0	372.9	47.1	768.0
Canthidermis sufflamen	HOOK & LINE	12	375.1	28.4	7.6	370.0	12	1,191.4	268.2	22.5	1,150.0
(Ocean triggerfish)	HOOK & LINE	1	260.0	.	.	260.0	1	525.0	.	.	525.0
	TRAPS	4	331.3	19.3	5.8	335.0	4	968.8	250.3	25.8	900.0

TABLE 6. Summary of fish length and weight by gear type for 1985 data (con't)

FAMILY – Family common name *Species name* (Species common name)	GEAR	1985 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN	1985 (WEIGHT IN GRAMS) N	MEAN	STD	CV	MEDIAN
OSTRACIIDAE – Boxfishes											
Lactophrys bicaudalis	HOOK & LINE	8	486.1	94.0	19.3		8	1,392.0	1,294.7	93.0	
(Spotted trunkfish)	OTHER GEAR	1	240.0	.	.	240.0	6	793.3	146.1	18.4	
	OTHER GEAR	6	437.7	31.8	7.3	240.0	1	325.0	.	.	325.0
	TRAPS	87	184.1	40.4	21.9	177.0	87	200.3	152.7	76.2	166.0
	TRAPS & HOOKS	1	175.0	.	.	175.0	1	150.0	.	.	150.0
	UNKNOWN	3	180.7	28.9	16.0	166.0	3	171.3	62.1	36.2	137.0
Lactophrys polygonia	OTHER GEAR	1	275.0	.	.	275.0	1	411.0	.	.	411.0
(Honeycomb cowfish)	TRAPS	373	238.5	42.5	17.8	235.0	373	282.6	140.9	49.9	255.0
	TRAPS & HOOKS	19	247.9	37.9	15.3	242.0	19	297.6	121.2	40.7	255.0
	UNKNOWN	9	227.3	44.9	19.8	212.0	9	266.2	214.0	80.4	183.0
Lactophrys quadricornis	TRAPS	215	206.8	39.2	18.9	200.0	215	172.0	96.8	56.3	147.0
(Scrawled cowfish)	TRAPS & HOOKS	4	294.3	33.8	11.5	299.0	4	410.5	193.4	47.1	368.5
	UNKNOWN	9	213.9	31.3	14.6	220.0	9	171.4	63.5	37.0	164.0
Lactophrys trigonius	TRAPS	11	303.4	53.9	17.8	310.0	11	574.7	187.0	32.5	622.0
(Trunkfish)	UNKNOWN	8	265.5	81.4	30.7	224.0	8	425.4	379.5	89.2	193.5
Lactophrys triqueter	TRAPS	64	170.3	30.5	17.9	166.5	64	163.5	77.8	47.6	148.5
(Smooth trunkfish)	TRAPS & HOOKS	3	185.3	18.6	10.0	180.0	3	208.3	38.2	18.3	200.0
	UNKNOWN	1	135.0	.	.	135.0	1	91.0	.	.	91.0
MISCELLANEOUS – Multiple species											
Uncategorized fish	HOOK & LINE	1	730.0	.	.		1	9,999.0	.	.	
(mixed fish)	HOOK & LINE	1	999.0	.	.		1	7,450.0	.	.	
	TRAPS	222	197.8	72.3	36.5		222	260.2	809.8	311.2	
	TRAPS & HOOKS	3	336.7	10.4	3.1		3	933.3	152.8	16.4	
TOTAL =		**26,317**					**26,317**				

TABLE 7. Summary of fish length and weight by gear type for 1990 data

FAMILY – Family common name *Species name* (Species common name)	GEAR	1990 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN	1990 (WEIGHT IN GRAMS) N	MEAN	STD	CV	MEDIAN
HOLOCENTRIDAE – Squirrelfishes											
Holocentrus ascensionis	BOTTOM LINE	4	220.8	18.9	8.6	220.0	4	207.5	64.0	30.8	225.0
(Squirrelfish)	FISH POT	8	208.4	19.5	9.4	205.0	8	179.3	39.3	22.0	170.0
	GILL NET	3	220.0	15.0	6.8	220.0	3	201.7	40.4	20.0	225.0
Holocentrus rufus	FISH POT	1	219.0	.		219.0	1	165.0	.		165.0
(Longspine squirrelfish)											
Holocentrus spe.	FISH POT	9	171.2	21.8	12.7	170.0	9	125.0	44.2	35.4	122.0
(Unidentified squirrelfish)											
SERRANIDAE – Sea basses											
Epinephelus adscensionis	FISH POT	1	678.0	.		678.0	1	5,102.0	.		5,102.0
(Rock hind)	LONGLINE	1	380.0	.		380.0	1	810.0	.		810.0
	OTHER	13	364.2	63.5	17.4	375.0	13	703.1	370.7	52.7	695.0
	SCUBA DIVING	32	228.5	160.6	70.3	190.0	32	730.5	411.8	56.4	597.5
	TRAMMEL NET	1	287.0	.		287.0	1	370.0	.		370.0
Epinephelus afer	GILL NET	1	280.0	.		280.0	1	370.0	.		370.0
(Mutton hamlet)											
Epinephelus cruentatus	BOTTOM LINE	168	238.4	30.9	13.0	240.0	168	249.3	107.6	43.2	226.0
(Graysby)	FISH POT	37	245.5	28.4	11.6	246.0	37	242.3	82.9	34.2	235.0
	GILL NET	15	223.9	25.3	11.3	230.0	15	197.1	41.2	20.9	210.0
	LONGLINE	3	201.7	23.1	11.5	215.0	1	150.0	.		150.0
	OTHER	1	240.0	.		240.0	1	185.0	.		185.0
	SCUBA DIVING	2	244.5	0.7	0.3	244.5	2	392.5	258.1	65.8	392.5
	TRAMMEL NET	1	287.0	.		287.0	1	355.0	.		355.0
Epinephelus fulvus	BOTTOM LINE	108	240.3	32.5	13.5	235.0	100	251.1	117.4	46.8	222.5
(Coney)	FISH POT	95	226.7	32.9	14.5	230.0	95	194.9	62.6	32.1	185.0
	GILL NET	41	219.2	20.7	9.5	220.0	41	176.6	70.2	39.8	170.0
	LONGLINE	6	236.7	7.1	3.0	235.0	5	224.0	18.5	8.3	230.0
	OTHER	3	220.7	20.0	9.1	222.0	3	144.7	101.7	70.3	106.0
	SCUBA DIVING	6	250.0	33.7	13.5	264.0	6	230.8	66.7	28.9	265.0
	TRAMMEL NET	10	227.1	34.4	15.2	225.5	10	190.9	90.3	47.3	172.5
Epinephelus guttatus	BOTTOM LINE	423	294.2	63.8	21.7	285.0	412	438.8	291.2	66.4	332.5
(Red hind)	FISH POT	142	272.6	51.2	18.8	265.0	140	282.4	147.1	52.1	235.0
	GILL NET	23	238.0	57.4	24.1	242.0	23	250.6	83.7	33.4	250.0
	LONGLINE	13	251.4	22.7	9.0	250.0	12	237.7	80.8	34.0	222.5
	OTHER	3	251.7	16.1	6.4	245.0	3	173.3	16.1	9.3	180.0
	SCUBA DIVING	157	370.5	59.7	16.1	370.5	157	742.5	348.7	47.0	690.0
	TRAMMEL NET	16	282.7	24.5	8.7	370.0	16	290.9	100.2	34.4	292.5
Epinephelus itajara	BOTTOM LINE	5	437.6	200.5	45.8	283.5	5	1,970.0	3,464.1	175.8	460.0
(Jewfish)	OTHER	2	365.0	487.9	133.7	346.0	2	14,063.5	12,184.2	86.6	14,063.5
	SCUBA DIVING	2	399.5	57.3	14.3	399.5	2	25,197.0	18,940.6	75.2	25,197.0
Epinephelus morio	BOTTOM LINE	1	256.0	.		256.0	1	225.0	.		225.0
(Red grouper)	FISH POT	1	465.0	.		465.0	0	.	.		
Epinephelus mystacinus	BOTTOM LINE	3	212.0	81.5	38.5	213.0	3	8,533.0	14,215.3	166.6	425.0
(Misty grouper)	FISH POT	1	433.0	.		433.0	1	1,385.0	.		1,385.0
	GILL NET	4	322.3	70.3	21.8	320.5	4	3,541.8	5,586.0	157.7	867.5
Epinephelus striatus	FISH POT	4	332.5	63.4	19.1	348.0	4	526.3	278.6	52.9	535.0
(Nassau grouper)	GILL NET	1	352.0	.		352.0	1	630.0	.		630.0
	SCUBA DIVING	31	437.5	69.6	15.9	445.0	30	1,144.8	516.6	45.1	1,162.5
Mycteroperca bonaci	SCUBA DIVING	37	560.9	158.4	28.3	550.0	36	3,383.1	2,927.1	86.5	
(Black grouper)											
Mycteroperca interstitialis	SCUBA DIVING	1	393.0	.		393.0	1	790.0	.		790.0
(Yellowmouth grouper)											
Mycteroperca tigris	FISH POT	1	260.0	.		260.0	1	230.0	.		230.0
(Tiger grouper)											
Mycteroperca venenosa	BOTTOM LINE	7	619.4	107.8	17.4	640.0	7	4,940.9	2,595.9	52.5	4,536.0
(Yellowfin grouper)	SCUBA DIVING	1	400.0	.		400.0	1	790.0	.		790.0
CARANGIDAE – Jacks											
Caranx lugubris	BOTTOM LINE	34	446.4	57.5	12.9	431.5	0	.	.		
(Black jack)											

TABLE 7. Summary of fish length and weight by gear type for 1990 data (con't)

FAMILY – Family common name / *Species name* (Species common name)	GEAR	1990 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN	1990 (WEIGHT IN GRAMS) N	MEAN	STD	CV	MEDIAN
Caranx bartholomaei	BEACH SEINE	61	475.7	96.0	20.2	486.0	0	.	.		
(Yellow jack)	BOTTOM LINE	9	452.7	256.8	56.7	340.0	9	3,711.8	5,539.0	149.2	605.0
	FISH POT	2	277.5	96.9	34.9	277.5	1	680.0	.		680.0
	GILL NET	18	275.9	30.2	11.0	282.0	18	400.6	134.9	33.7	397.5
	LONGLINE	9	328.8	51.3	15.6	330.0	9	578.3	237.0	41.0	595.0
	SCUBA DIVING	1	412.0	.		412.0	1	1,340.0	.		1,340.0
	TRAMMEL NET	1	351.0	.		351.0	1	710.0	.		710.0
Caranx crysos	BEACH SEINE	1	257.0	.		257.0	0	.	.		
(Blue runner)	BOTTOM LINE	71	381.1	58.2	15.3	380.0	71	1,078.9	416.4	38.6	1,005.0
	FISH POT	1	322.0	.		322.0	1	500.0	.		500.0
	GILL NET	26	300.7	44.5	14.8	308.5	26	478.0	232.4	48.6	427.5
	OTHER	2	445.5	105.4	23.7	445.5	2	1,767.5	1,028.8	58.2	1,767.5
	GILL NET	16	286.5	146.6	51.2	253.5	16	945.4	1,907.0	201.7	
Caranx hippos	LONGLINE	1	585.0	.		585.0	1	3,515.0	.		3,515.0
(Crevalle jack)	OTHER	6	86.8	19.7	22.7	78.5	6	609.2	383.3	62.9	
Caranx latus	BOTTOM LINE	30	418.7	120.5	28.8	369.0	21	1,484.2	971.5	65.5	1,111.0
(Horse–eye jack)	GILL NET	66	169.8	26.0	15.3	170.5	63	114.5	53.2	46.4	106.0
	LONGLINE	28	316.1	65.9	20.9	319.0	27	600.7	292.0	48.6	550.0
	OTHER	21	383.9	110.0	28.7	320.0	0	.	.		
Caranx ruber	BEACH SEINE	46	198.1	81.4	41.1	150.0	28	51.7	21.7	42.1	48.0
(Bar jack)	BOTTOM LINE	46	324.8	32.3	9.9	316.0	44	547.2	186.5	34.1	505.0
	FISH POT	45	245.8	45.9	18.7	243.0	45	271.4	157.8	58.1	230.0
	GILL NET	106	279.5	37.3	13.4	277.5	79	344.7	131.0	38.0	320.0
	TRAMMEL NET	30	291.6	43.6	15.0	283.0	30	408.0	209.8	51.4	340.0
LUTJANIDAE – Snappers											
Etelis oculatus	BOTTOM LINE	352	400.5	138.4	34.6	360.0	115	750.2	900.6	120.0	390.0
(Queen snapper)											
Lutjanus analis	BEACH SEINE	76	259.5	64.6	24.9	257.5	32	280.5	340.5	121.4	79.0
(Mutton snapper)	BOTTOM LINE	57	447.4	146.3	32.7	445.0	50	1,779.4	1,643.6	92.4	1,218.5
	FISH POT	41	299.2	87.7	29.3	285.0	39	460.6	556.2	120.8	340.0
	GILL NET	125	241.5	115.4	47.8	207.0	125	889.6	4,938.6	555.2	150.0
	LONGLINE	16	366.0	108.9	29.8	336.0	14	953.5	1,229.8	129.0	560.0
	OTHER	4	583.0	157.3	27.0	621.0	3	3,237.3	2,249.4	69.5	4,536.0
	SCUBA DIVING	5	481.8	150.6	31.3	405.0	5	2,186.2	2,006.5	91.8	985.0
	TRAMMEL NET	1	252.0	.		252.0	1	240.0	.		240.0
Lutjanus apodus	BOTTOM LINE	44	376.5	87.1	23.2	392.0	43	1,251.1	1,076.2	86.0	1,185.0
(Schoolmaster)	FISH POT	30	253.2	70.6	27.9	244.0	29	270.0	118.0	43.7	245.0
	GILL NET	13	244.1	26.2	10.7	249.0	13	301.9	105.4	34.9	290.0
	OTHER	6	249.8	19.1	7.6	244.5	6	259.2	70.9	27.4	250.0
	SCUBA DIVING	21	317.5	70.6	22.2	300.0	21	590.2	387.2	65.6	455.0
	TRAMMEL NET	82	281.1	43.8	15.6	270.0	82	429.5	248.4	57.8	357.5
Lutjanus buccanella	BOTTOM LINE	56	303.5	86.6	28.5	307.0	45	446.2	310.3	69.5	345.0
(Blackfin snapper)	FISH POT	99	236.9	39.1	16.5	232.0	49	261.6	257.8	98.6	182.0
	GILL NET	2	215.5	2.1	1.0	215.5	2	162.5	10.6	6.5	162.5
Lutjanus cyanopterus	BOTTOM LINE	6	622.2	162.1	26.1	624.5	4	5,242.0	4,387.4	83.7	4,309.5
(Cubera snapper)	FISH POT	1	287.0	.		287.0	1	300.0	.		300.0
	OTHER	2	710.0	113.1	15.9	710.0	0	.	.		
Lutjanus griseus	BOTTOM LINE	4	415.3	114.7	27.6	400.0	2	2,589.5	1,470.1	56.8	2,589.5
(Gray snapper)	FISH POT	1	270.0	.		270.0	1	270.0	.		270.0
	GILL NET	3	280.0	75.5	27.0	290.0	3	443.3	183.4	41.4	380.0
	OTHER	1	280.0	.		280.0	1	280.0	.		280.0
	SCUBA DIVING	1	320.0	.		320.0	1	330.0	.		330.0
Lutjanus jocu	BOTTOM LINE	2	255.0	25.5	10.0	255.0	2	265.0	56.6	21.4	265.0
(Dog snapper)	FISH POT	1	483.0	.		483.0	1	1,630.0	.		1,630.0
	GILL NET	10	283.9	43.4	15.3	271.0	10	357.0	159.0	44.6	290.0
	OTHER	3	450.7	79.0	17.5	450.0	3	1,345.0	522.2	38.8	1,445.0
	SCUBA DIVING	22	430.0	95.2	22.2	417.5	22	1,401.0	1,166.2	83.3	1,120.0
Lutjanus mahogoni	BOTTOM LINE	2	262.5	74.3	28.3	262.5	2	280.0	212.1	75.8	280.0
(Mahogany snapper)	GILL NET	5	320.4	21.5	6.7	314.0	0	.	.		
	LONGLINE	3	310.0	8.0	2.6	310.0	0	.	.		
Lutjanus spe.	FISH POT	1	210.0	.		210.0	1	150.0	.		150.0
(Unidentified snapper)	OTHER	2	447.5	24.8	5.5	447.5	0	.	.		

TABLE 7. Summary of fish length and weight by gear type for 1990 data (con't)

FAMILY – Family common name / *Species name* (Species common name)	GEAR	1990 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN	1990 (WEIGHT IN GRAMS) N	MEAN	STD	CV	MEDIAN
Lutjanus synagris	BEACH SEINE	79	214.7	38.4	17.9	208.0	52	178.3	106.1	59.5	147.5
(Lane snapper)	BOTTOM LINE	381	240.6	39.3	16.4	235.0	377	234.3	104.3	44.5	212.0
	FISH POT	509	217.5	36.8	16.9	214.0	506	175.1	96.2	55.0	155.0
	GILL NET	132	226.3	46.7	20.6	226.0	132	204.0	115.8	56.8	177.5
	LONGLINE	1,010	239.4	34.8	14.5	235.0	866	214.2	93.5	43.7	190.0
	OTHER	48	237.4	28.1	11.8	230.5	48	238.2	131.3	55.1	202.5
	TRAMMEL NET	13	253.6	22.9	9.0	257.0	13	302.3	112.9	37.4	310.0
Lutjanus vivanus	BOTTOM LINE	319	282.3	61.2	21.7	273.0	310	425.4	785.4	184.6	320.0
(Silk snapper)	FISH POT	294	259.6	52.3	20.2	251.5	225	288.9	218.3	75.6	230.0
	GILL NET	33	237.9	29.8	12.5	237.0	33	206.6	83.7	40.5	195.0
	LONGLINE	2	173.5	5.0	2.9	173.5	2	91.0	15.6	17.1	91.0
Ocyurus chrysurus	BEACH SEINE	429	240.7	44.3	18.4	235.0	110	227.7	136.1	59.8	210.0
(Yellowtail snapper)	BOTTOM LINE	1,196	282.7	53.1	18.8	280.0	1,048	413.3	1,628.7	394.1	310.0
	FISH POT	207	231.8	38.5	16.6	223.0	200	200.0	117.7	58.9	170.0
	GILL NET	90	237.4	37.5	15.8	227.5	90	231.0	116.3	50.4	202.5
	LONGLINE	120	283.1	48.9	17.3	276.5	84	297.0	146.8	49.4	255.0
	OTHER	56	279.6	43.2	15.5	281.5	56	351.7	145.4	41.3	332.5
	TRAMMEL NET	21	279.1	40.0	14.3	288.0	21	309.8	76.4	24.7	310.0
Rhomboplites aurorubens	BOTTOM LINE	527	214.9	39.9	18.6	212.0	481	188.8	112.3	59.5	170.0
(Vermilion snapper)	FISH POT	231	199.8	24.4	12.2	198.0	204	126.9	49.4	38.9	118.0
	GILL NET	75	205.6	28.5	13.9	200.0	75	140.1	58.5	41.8	130.0
	LONGLINE	3	195.3	17.2	8.8	192.0	3	119.3	29.1	24.4	116.0
HAEMULIDAE – Grunts											
Anisotremus surinamensis	BOTTOM LINE	4	268.0	51.0	19.0	256.0	4	536.3	373.9	69.7	387.5
(Black margate)	FISH POT	10	264.9	26.4	10.0	255.0	10	453.4	263.5	58.1	335.0
	GILL NET	7	263.4	55.1	20.9	244.0	7	329.9	98.6	29.9	265.0
Anisotremus virginicus	FISH POT	61	223.5	52.7	23.6	218.0	61	267.0	96.2	36.0	220.0
(Porkfish)	GILL NET	9	206.0	25.7	12.5	204.0	9	234.4	91.4	39.0	205.0
	OTHER	1	198.0	.		198.0	1	205.0	.		287.5
	TRAMMEL NET	26	221.6	33.2	15.0	221.0	26	289.9	92.9	32.1	285.0
Conodon nobilis	GILL NET	53	263.2	32.3	12.3	267.0	53	287.6	63.5	22.1	
(Barred grunt)											
Haemulon album	BOTTOM LINE	1	270.0	.		270.0	1	370.0	.		370.0
(Margate)	FISH POT	6	303.8	87.5	28.8	295.0	6	642.5	659.2	102.6	415.0
	GILL NET	1	220.0	.		220.0	1	205.0	.		205.0
Haemulon aurolineatum	BOTTOM LINE	9	174.7	30.4	17.4	166.0	9	101.9	44.5	43.6	76.0
(Tomtate)	FISH POT	21	152.3	9.7	6.4	153.0	21	68.7	18.9	27.6	64.0
Haemulon bonariense	FISH POT	1	193.0	.		193.0	1	150.0	.		150.0
(Black grunt)	TRAMMEL NET	2	287.0	43.8	15.3	287.0	2	530.0	141.4	26.7	530.0
Haemulon carbonarium	BOTTOM LINE	4	211.8	21.2	10.0	222.0	4	199.0	37.4	18.8	210.5
(Caesar grunt)	GILL NET	8	244.1	39.8	16.3	231.0	8	266.3	107.4	40.4	222.5
	TRAMMEL NET	6	235.8	44.2	18.7	215.5	6	271.7	126.0	46.4	222.5
Haemulon chrysargyreum	FISH POT	3	159.0	5.2	3.3	162.0	3	67.3	8.3	12.4	70.0
(Smallmouth grunt)											
Haemulon flavolineatum	BOTTOM LINE	3	170.7	14.0	8.2	175.0	3	95.0	39.5	41.6	94.0
(French grunt)	FISH POT	35	178.5	23.4	13.1	180.0	35	118.6	38.3	32.3	124.0
	TRAMMEL NET	8	193.6	29.6	15.3	184.5	8	173.5	80.8	46.6	147.5
Haemulon macrostomum	BOTTOM LINE	19	222.1	32.4	14.6	217.0	19	253.8	126.1	49.7	220.0
(Spanish grunt)	FISH POT	19	204.1	29.8	14.6	200.0	18	196.8	107.9	54.8	165.0
	GILL NET	9	223.3	22.9	10.3	215.0	9	248.3	93.2	37.5	220.0
	LONGLINE	2	302.5	38.9	12.9	302.5	2	550.0	332.3	60.4	550.0
Haemulon parrai	FISH POT	6	239.3	25.0	10.5	241.0	6	226.7	60.8	26.8	212.5
(Sailor's choice)	GILL NET	59	234.9	29.4	12.5	240.0	59	237.2	71.6	30.2	231.0
Haemulon plumieri	BEACH SEINE	29	173.2	18.3	10.6	172.0	0	.	.		
(White grunt)	BOTTOM LINE	701	232.9	29.0	12.5	230.0	700	264.0	90.5	34.3	250.0
	FISH POT	1,100	202.5	37.4	18.5	200.0	1,077	169.9	76.3	44.9	155.0
	GILL NET	329	222.2	25.5	11.5	222.0	329	226.6	85.5	37.7	215.0
	LONGLINE	58	239.6	26.9	11.2	238.0	57	280.1	92.9	33.2	260.0
	OTHER	19	199.8	25.8	12.9	195.0	19	154.5	61.4	39.7	135.0
	TRAMMEL NET	412	231.5	23.9	10.3	232.5	412	246.8	76.4	31.0	242.5

TABLE 7. Summary of fish length and weight by gear type for 1990 data (con't)

FAMILY – Family common name / *Species name* (Species common name)	GEAR	1990 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN	1990 (WEIGHT IN GRAMS) N	MEAN	STD	CV	MEDIAN
Haemulon sciurus	BOTTOM LINE	29	232.7	37.5	16.1	233.0	29	270.9	120.7	44.6	270.0
(Bluestriped grunt)	FISH POT	115	202.7	29.0	14.3	195.0	98	163.8	79.6	48.6	135.5
	GILL NET	131	230.0	28.3	12.3	222.0	130	257.9	179.4	69.6	230.0
	OTHER	1	255.0	.		255.0	1	290.0	.		290.0
	TRAMMEL NET	80	229.1	31.6	13.8	230.0	79	238.1	91.6	38.5	210.0
Haemulon sp.	FISH POT	1	232.0	.		232.0	1	230.0	.		230.0
(Unidentified grunt)											
Pomadasys corcro	GILL NET	1	240.0	.		240.0	1	170.0	.		170.0
(Burro grunt)											
SPARIDAE – Porgies											
Archosargus rhomboidalis	BEACH SEINE	2	182.5	10.6	5.8	182.5	0	.	.		0.0
(Sea bream)	FISH POT	4	192.3	18.7	9.7	184.5	4	148.3	44.6	30.1	128.0
	GILL NET	2	171.0	1.4	0.8	171.0	2	115.0	7.1	6.2	115.0
Calamus bajonado	BEACH SEINE	1	400.0	.		400.0	0	.	.		
(Jolthead porgy)	BOTTOM LINE	8	222.5	44.3	19.9	204.5	8	289.8	251.1	86.7	200.0
	FISH POT	261	185.4	28.6	15.4	178.0	252	157.7	78.9	50.0	130.0
	GILL NET	190	197.4	27.3	13.9	192.0	189	205.9	93.4	45.4	180.0
	OTHER	4	162.5	7.6	4.7	161.0	4	40.5	14.9	36.8	41.0
	SCUBA DIVING	3	297.3	50.7	17.0	277.0	3	573.3	227.8	39.7	495.0
	TRAMMEL NET	51	208.0	52.6	25.3	206.0	48	234.9	126.5	53.9	210.0
Calamus penna	BEACH SEINE	5	181.8	32.5	17.9	170.0	0	.	.		
(Sheepshead porgy)	BOTTOM LINE	3	210.0	26.5	12.6	200.0	3	221.7	82.2	37.1	190.0
	FISH POT	59	173.9	20.0	11.5	170.0	59	130.2	49.3	37.9	118.0
	GILL NET	22	194.3	18.2	9.4	189.5	22	184.3	50.1	27.2	165.0
	GILL NET	2	187.0	11.3	6.1	187.0	2	157.5	10.6	6.7	157.5
	LONGLINE	6	239.5	54.8	22.9	253.5	6	388.3	144.3	37.2	435.0
	OTHER	5	236.2	41.5	17.6	245.0	5	322.2	151.1	46.9	345.0
	TRAMMEL NET	13	199.7	14.2	7.1	196.0	13	208.8	55.1	26.4	215.0
MULLIDAE – Goatfishes											
Mulloidichthys martinicus	FISH POT	98	185.0	29.3	15.9	184.0	95	126.5	67.6	53.4	108.0
(Yellow goatfish)	GILL NET	1	244.0	.		244.0	1	275.0	.		275.0
	OTHER	4	201.8	24.1	12.0	203.0	4	136.0	44.0	32.4	133.0
	TRAMMEL NET	8	212.8	18.1	8.5	218.5	8	172.0	52.8	30.7	192.5
Pseudupeneus maculatus	FISH POT	449	179.9	29.6	16.5	178.0	447	109.8	54.7	49.8	104.0
(Spotted goatfish)	OTHER	18	179.6	12.3	6.8	178.0	18	100.7	19.5	19.3	101.0
	TRAMMEL NET	3	188.3	11.1	5.9	187.0	3	137.0	24.4	17.8	126.0
EPHIPPIDAE – Spadefishes											
Chaetodiperus faber	TRAMMEL NET	1	271.0	.		271.0	1	690.0	.		690.0
(Atlantic spadefish)											
POMACANTHIDAE – Angelfishes											
Pomacanthus arcuatus	TRAMMEL NET	1	305.0	.		305.0	1	1,370.0	.		1,370.0
(Gray angelfish)											
LABRIDAE – Wrasses											
Bodianus rufus	FISH POT	1	296.0	.		296.0	1	330.0	.		330.0
(Spanish hogfish)	GILL NET	1	268.0	.		268.0	1	320.0	.		320.0
	OTHER	2	298.0	2.8	1.0	298.0	2	387.5	53.0	13.7	387.5
	SCUBA DIVING	2	277.5	10.6	3.8	277.5	2	322.5	38.9	12.1	322.5
	TRAMMEL NET	2	283.5	26.2	9.2	283.5	2	397.5	109.6	27.6	397.5
Halichoeres radiatus	TRAMMEL NET	1	283.0	.		283.0	1	300.0	.		300.0
(Puddingwife)											
Lachnolaimus maximus	BOTTOM LINE	6	495.7	98.0	19.8	502.5	6	2,412.2	1,677.0	69.5	2,349.5
(Hogfish)	FISH POT	28	284.8	69.0	24.2	256.0	28	528.3	504.1	95.4	342.5
	GILL NET	3	262.3	32.0	12.2	263.0	3	388.3	193.7	49.9	345.0
	OTHER	5	357.4	107.3	30.0	372.0	5	914.0	597.9	65.4	970.0
	SCUBA DIVING	156	409.5	102.5	25.0	400.0	154	1,311.6	1,263.6	96.3	1,110.0
	TRAMMEL NET	6	295.2	82.9	28.1	269.5	6	585.0	463.9	79.3	415.0

TABLE 7. Summary of fish length and weight by gear type for 1990 data (con't)

FAMILY – Family common name / *Species name* (Species common name)	GEAR	1990 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN	1990 (WEIGHT IN GRAMS) N	MEAN	STD	CV	MEDIAN
SCARIDAE – Parrotfishes											
Scarus coelestinus	SCUBA DIVING	2	610.0	77.8	12.8	610.0	2	3,616.5	2,583.1	71.4	3,616.5
(Midnight parrotfish)											
Scarus coeruleus	GILL NET	24	197.8	13.7	6.9	195.0	24	204.0	41.0	20.1	190.0
(Blue parrotfish)											
Scarus guacamaia	OTHER	2	496.5	54.5	11.0	496.5	2	1,660.0	91.9	5.5	1,660.0
(Rainbow parrotfish)	SCUBA DIVING	4	621.3	99.7	16.1	647.5	3	3,418.7	1,566.7	45.8	4,199.0
Scarus spe.	FISH POT	2	270.0	28.3	10.5	270.0	2	367.5	201.5	54.8	367.5
(Unidentified parrotfish)											
Scarus taeniopterus	FISH POT	51	245.2	12.2	5.0	244.0	51	268.4	42.9	16.0	255.0
(Princess parrotfish)	GILL NET	1	250.0	.		250.0	1	345.0	.		345.0
	OTHER	1	232.0	.		232.0	1	170.0	.		170.0
	SCUBA DIVING	1	400.0	.		400.0	1	1,025.0	.		1,025.0
	TRAMMEL NET	10	276.4	33.2	12.0	264.0	10	339.0	136.6	40.3	310.0
Scarus vetula	FISH POT	5	300.2	9.7	3.2	300.0	5	475.0	62.9	13.2	490.0
(Queen parrotfish)	GILL NET	37	287.7	54.0	18.8	297.0	37	509.5	169.3	33.2	500.0
	TRAMMEL NET	42	305.9	31.4	10.3	306.5	42	480.6	213.9	44.5	472.5
Sparisoma aurofrenatum	FISH POT	12	232.8	35.7	15.3	218.5	12	231.8	111.8	48.2	172.5
(Redband parrotfish)	GILL NET	24	229.6	11.4	5.0	232.0	24	200.2	24.5	12.2	197.5
	TRAMMEL NET	16	241.9	34.1	14.1	225.5	16	292.5	115.8	39.6	245.0
Sparisoma chrysopterum	BOTTOM LINE	11	205.5	22.3	10.9	198.0	11	151.4	28.4	18.8	155.0
(Redtail parrotfish)	FISH POT	323	245.8	30.9	12.6	245.0	312	279.3	105.6	37.8	270.0
	GILL NET	132	265.6	26.2	9.9	266.0	132	408.5	99.7	24.4	400.0
	OTHER	5	262.4	24.3	9.3	270.0	5	321.0	82.3	25.6	305.0
	TRAMMEL NET	256	275.5	25.9	9.4	274.0	256	379.4	87.2	23.0	375.0
Sparisoma rubripinne	BOTTOM LINE	13	254.9	27.6	10.8	255.0	13	312.0	125.4	40.2	275.0
(Yellowtail parrotfish)	TRAMMEL NET	1	315.0	.		315.0	1	245.0	.		245.0
Sparisoma spe.	BEACH SEINE	22	175.5	30.6	17.4	170.0	0	.	.		
(Unidentified parrotfish)	BOTTOM LINE	78	245.6	45.1	18.4	249.0	78	392.6	161.4	41.1	355.0
	FISH POT	62	221.6	28.2	12.7	226.0	62	273.3	104.7	38.3	267.5
	GILL NET	123	204.6	29.3	14.3	192.0	122	238.3	98.8	41.4	210.0
	LONGLINE	11	249.6	18.3	7.3	245.0	9	378.3	74.2	19.6	370.0
	OTHER	2	206.5	33.2	16.1	206.5	2	240.0	99.0	41.3	240.0
Sparisoma viride	FISH POT	130	255.8	32.6	12.7	250.0	130	330.7	139.5	42.2	292.5
(Stoplight parrotfish)	GILL NET	154	260.2	28.4	10.9	255.0	154	440.7	169.1	38.4	430.0
	TRAMMEL NET	495	287.5	32.3	11.2	288.0	495	467.5	162.8	34.8	450.0
ACANTHURIDAE – Surgeonfishes											
Acanthurus bahianus	FISH POT	4	198.3	26.3	13.3	195.0	4	200.0	37.6	18.8	200.0
(Ocean surgeon)											
BALISTIDAE – Leatherjackets											
Balistes spe.	FISH POT	1	240.0	.		240.0	1	425.0	.		425.0
(Unidentified triggerfish)											
Balistes vetula	BOTTOM LINE	3	319.0	42.5	13.3	342.0	3	786.7	406.3	51.7	945.0
(Queen triggerfish)	FISH POT	78	279.1	52.7	18.9	278.5	77	577.1	316.2	54.8	520.0
	OTHER	17	261.7	38.7	14.8	255.0	17	460.6	219.5	47.7	425.0
	TRAMMEL NET	28	241.8	23.0	9.5	243.5	28	357.5	100.5	28.1	370.0
OSTRACIIDAE – Boxfishes											
Lactophrys bicaudalis	FISH POT	15	185.3	25.8	13.9	190.0	15	168.3	64.1	38.1	170.0
(Spotted trunkfish)	LONGLINE	1	320.0	.		320.0	1	815.0	.		815.0
	TRAMMEL NET	3	390.0	164.6	42.2	480.0	3	316.7	126.5	40.0	264.0
Lactophrys polygonia	FISH POT	99	218.1	32.9	15.1	215.0	99	206.2	89.4	43.4	180.0
(Honeycomb cowfish)	GILL NET	11	253.1	62.5	24.7	253.0	11	422.1	351.0	83.2	250.0
	OTHER	8	220.9	32.1	14.5	221.0	8	149.5	81.8	54.7	140.0
	SCUBA DIVING	1	355.0	.		355.0	1	870.0	.		870.0
	TRAMMEL NET	3	217.3	8.5	3.9	214.0	3	230.0	20.0	8.7	230.0

TABLE 7. Summary of fish length and weight by gear type for 1990 data (con't)

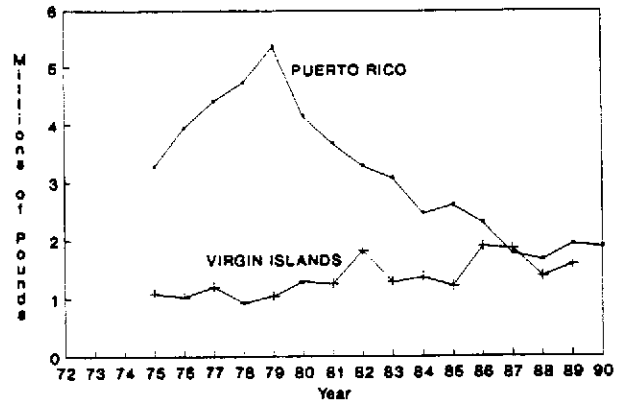
FAMILY – Family common name

Species name (Species common name)	GEAR	1990 (LENGTH IN MM) N	MEAN	STD	CV	MEDIAN	1990 (WEIGHT IN GRAMS) N	MEAN	STD	CV	MEDIAN
Lactophrys quadricornis	BOTTOM LINE	1	380.0	.		380.0	1	1,035.0	.		1,035.0
(Scrawled cowfish)	FISH POT	38	204.1	35.8	17.6	205.5	38	156.0	65.9	42.2	140.0
	OTHER	3	280.3	49.3	17.6	270.0	3	241.7	140.9	58.3	195.0
	TRAMMEL NET	6	256.3	28.4	11.1	268.0	6	292.5	97.5	33.3	295.0
Lactophrys trigonius	BEACH SEINE	2	347.5	17.7	5.1	347.5	2	895.0	144.3	16.1	895.0
(Trunkfish)	BOTTOM LINE	3	360.3	21.5	6.0	350.0	3	836.7	170.1	20.3	830.0
	FISH POT	6	189.2	62.2	32.9	170.0	6	185.8	167.1	89.9	130.5
	LONGLINE	7	325.1	49.7	15.3	335.0	7	812.1	133.1	16.4	795.0
	TRAMMEL NET	6	230.7	93.7	40.6	200.0	6	363.3	366.9	101.0	225.0
Lactophrys triqueter	FISH POT	21	165.7	18.8	11.4	170.0	21	157.1	37.0	23.5	170.0
(Smooth trunkfish)	GILL NET	4	378.3	70.4	18.6	355.0	4	870.0	529.9	60.9	710.0

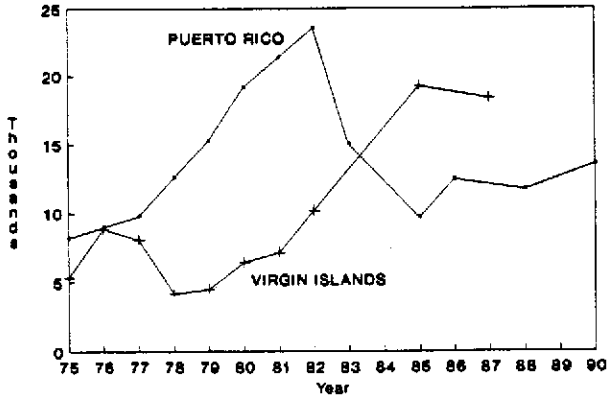
TOTAL = 16,258 **14,701**

Figure 1. Trends in total reef fish landings (A), fish trap use (B), and catch-per-unit-effort (C).

A.



B.



C.

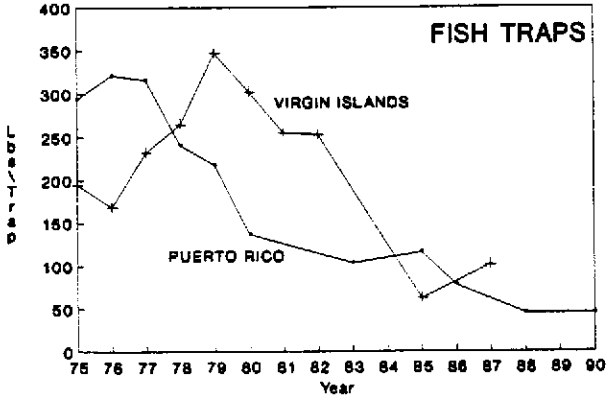


Figure 2. Red hind length-frequency data form Puerto Rico landings 1987-1991. Figure from Sadovy et al. in review.

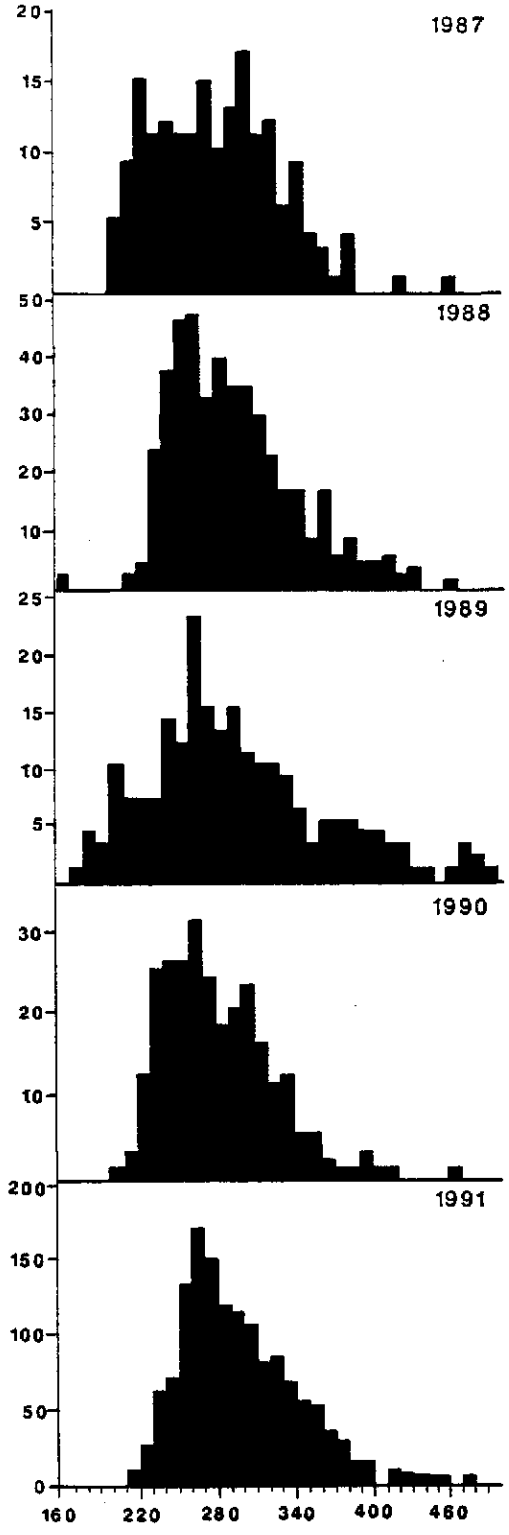


Figure 3. Red hind length-frequency comparison of 1984 and 1988 landings. Figure from Beets and Friedlander, in press.

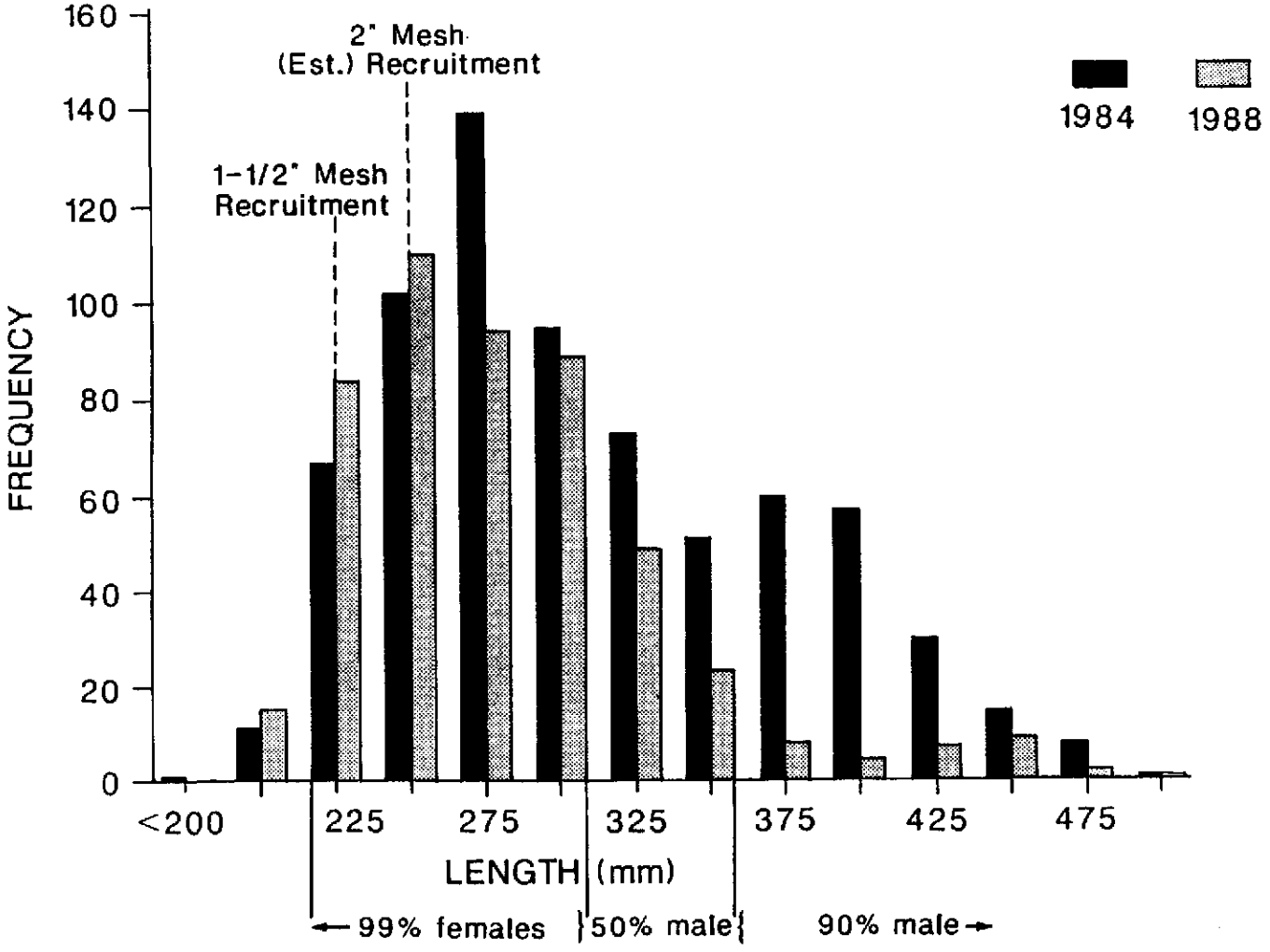


Figure 4. Red hind length-frequncy distribution for St. Croix 1984-1990. Figure from Beets and Friedlander, in press.

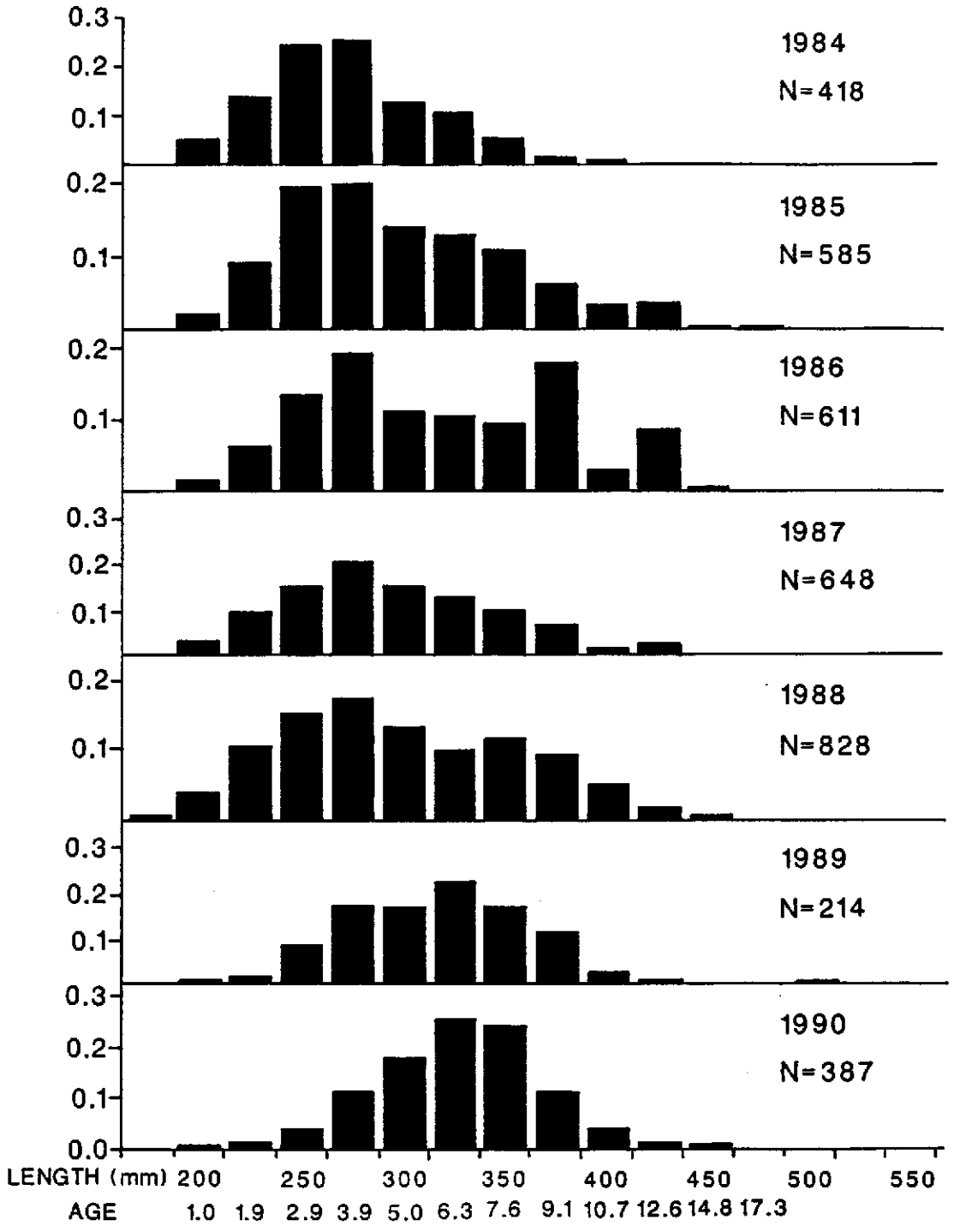


Figure 5. Red hind length-frequency distribution for St. Thomas 1984-1988. Figure from Beets and Friedlander, in press.

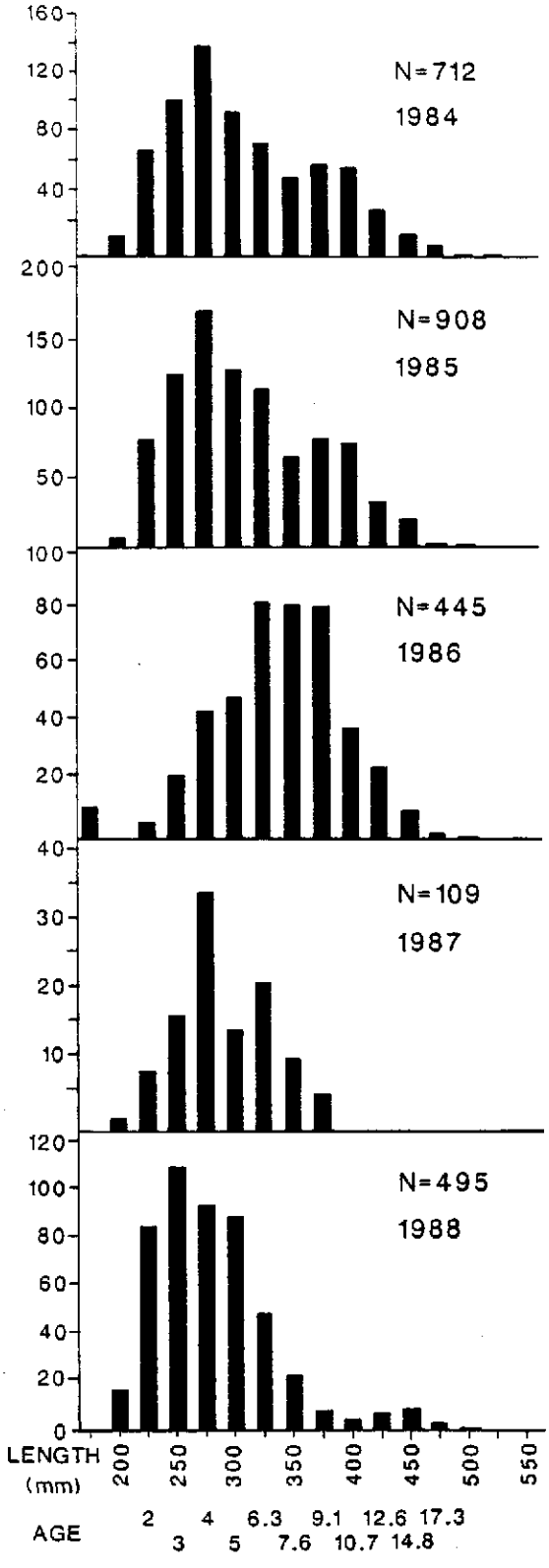


Figure 6. Red hind length-frequency distribution for Puerto Rico 1984-1990 (no data in 1986)

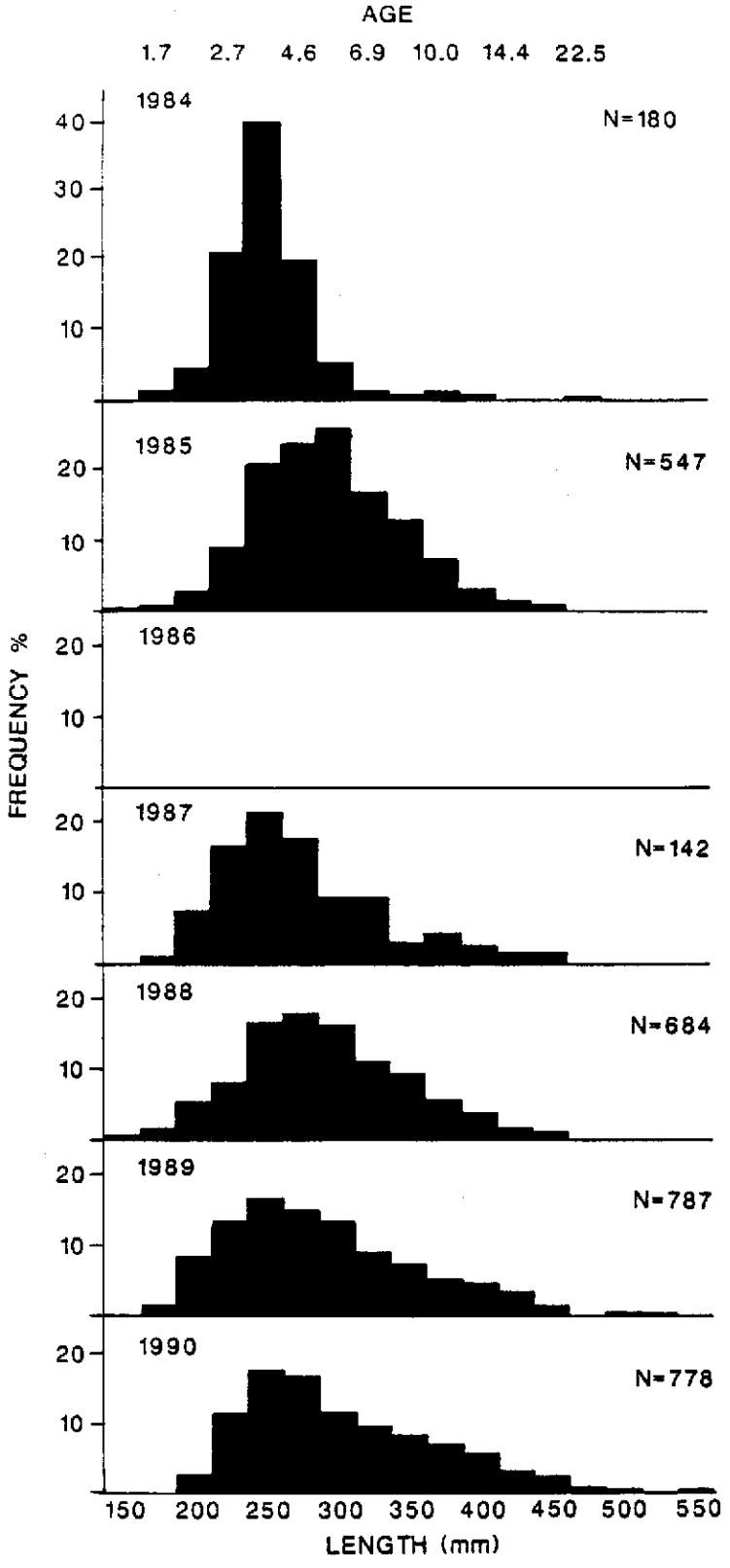
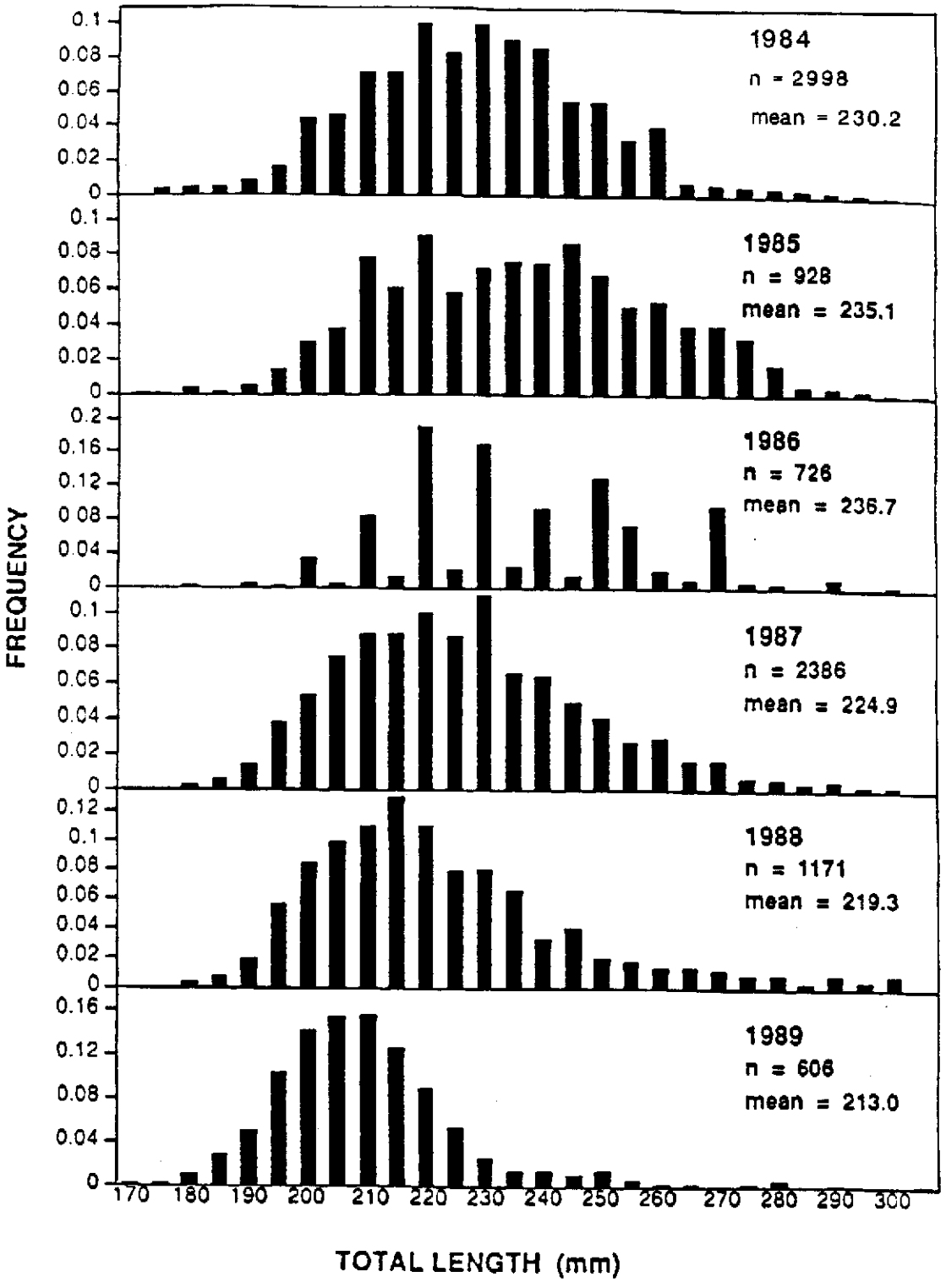
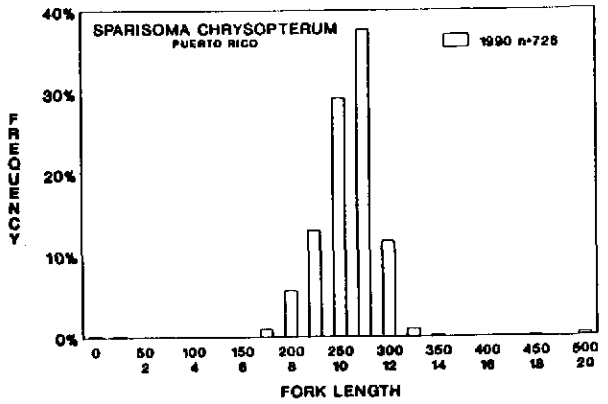
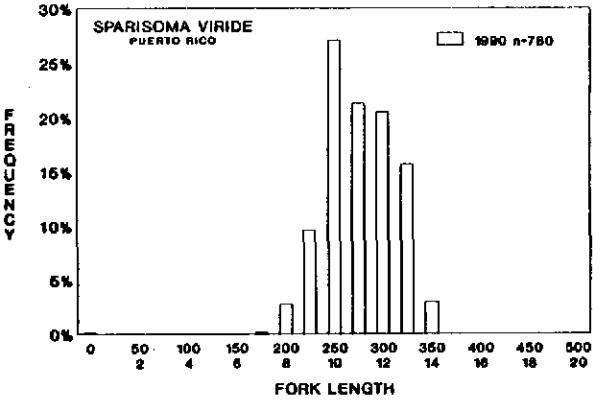


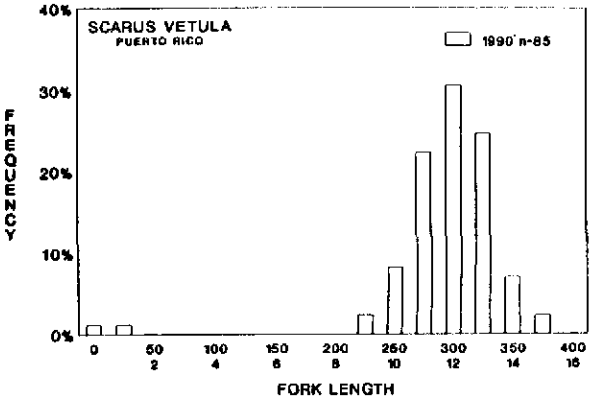
Figure 7. Coney length-frequency distribution for St. Croix 1984-1989. Figure from Beets et al. in press.

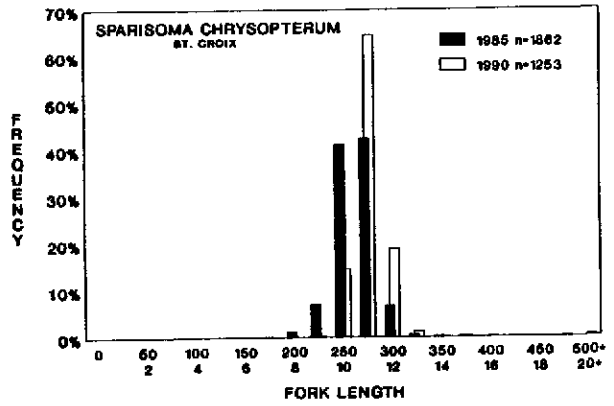


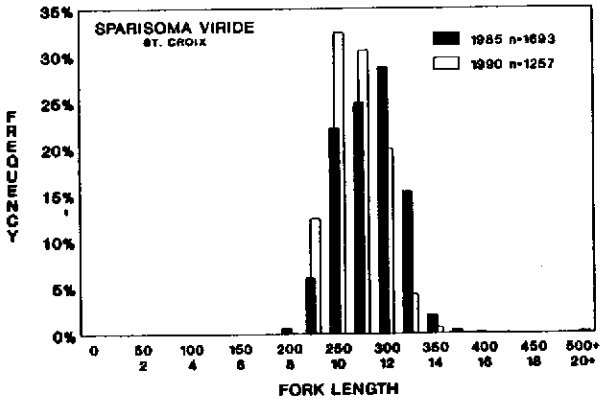
Appendix A. Graphical comparisons of length frequency by species for 1985 and 1990 based on reported biostatistical data. Upper number on x-axis denotes length in mm: lower in inches.

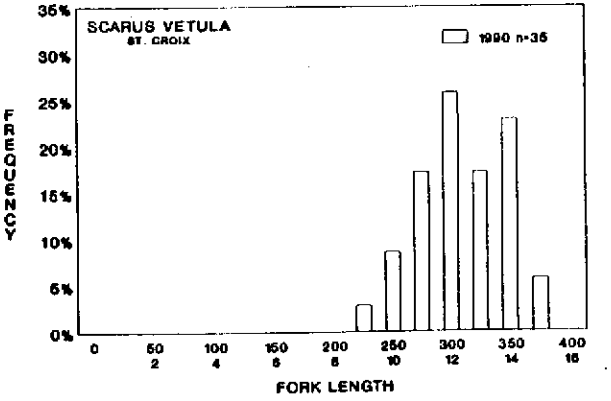

SPARISOMA CHRYSOPTERUM
PUERTO RICO
1990 n=726
FREQUENCY
FORK LENGTH

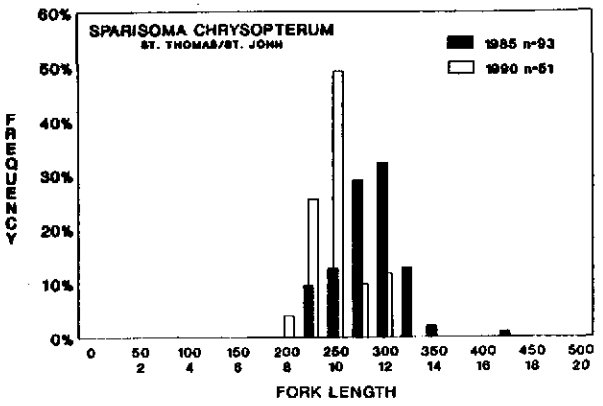

SPARISOMA VIRIDE
PUERTO RICO
1990 n=780
FREQUENCY
FORK LENGTH

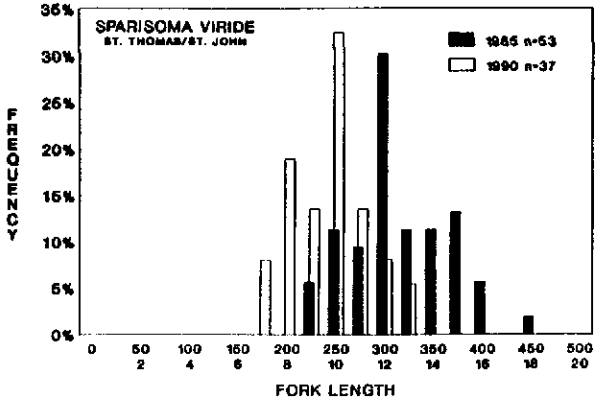

SCARUS VETULA
PUERTO RICO
1990 n=85
FREQUENCY
FORK LENGTH

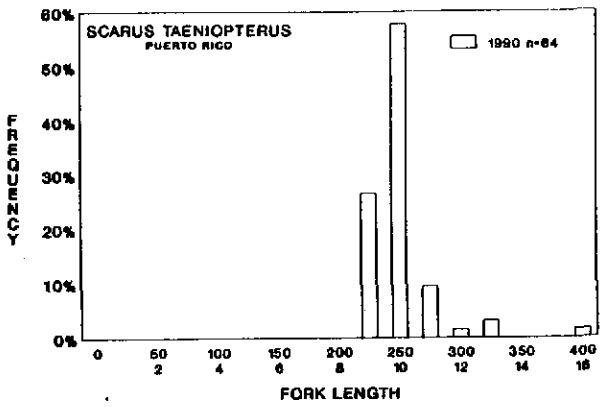

SPARISOMA CHRYSOPTERUM
ST. CROIX
1985 n=1862
1990 n=1253
FREQUENCY
FORK LENGTH

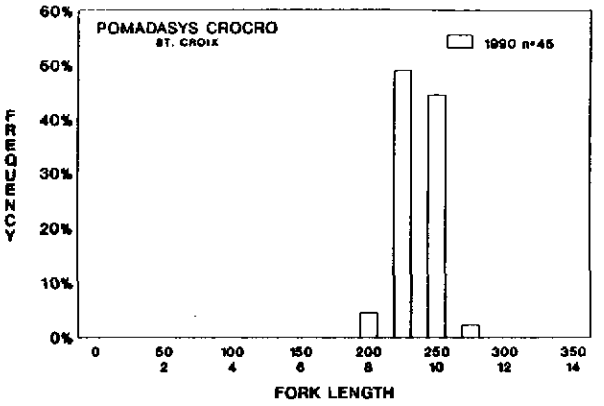

SPARISOMA VIRIDE
ST. CROIX
1985 n=1693
1990 n=1257
FREQUENCY
FORK LENGTH

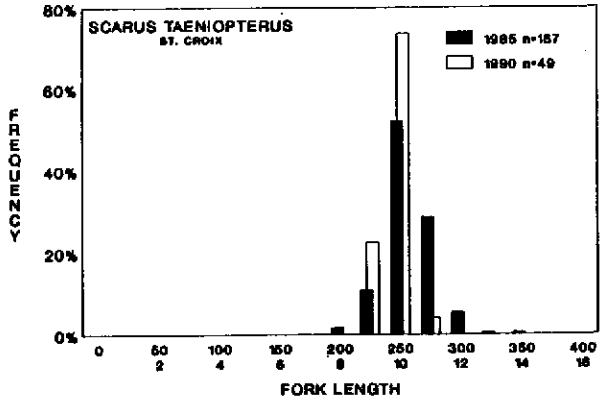

SCARUS VETULA
ST. CROIX
1990 n=35
FREQUENCY
FORK LENGTH

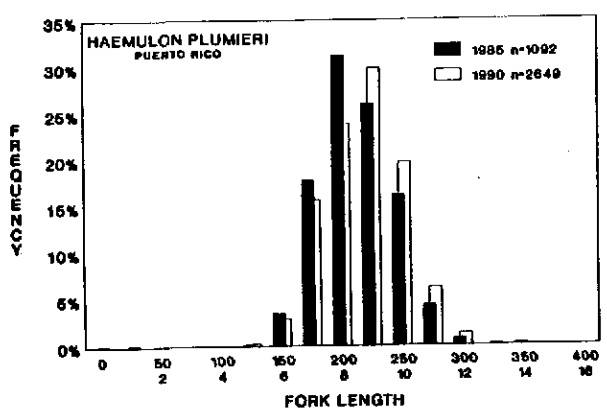

SPARISOMA CHRYSOPTERUM
ST. THOMAS/ST. JOHN
1985 n=93
1990 n=51
FREQUENCY
FORK LENGTH

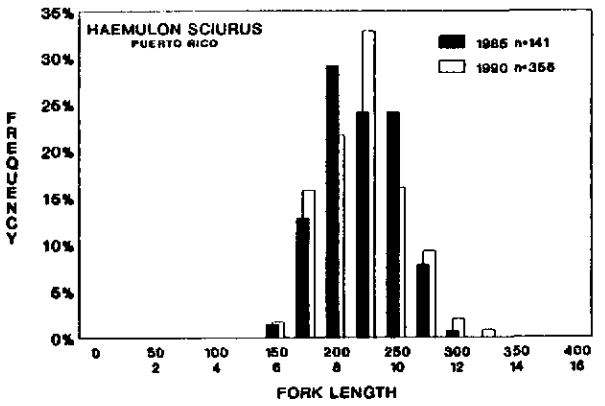

SPARISOMA VIRIDE
ST. THOMAS/ST. JOHN
1985 n=53
1990 n=37
FREQUENCY
FORK LENGTH

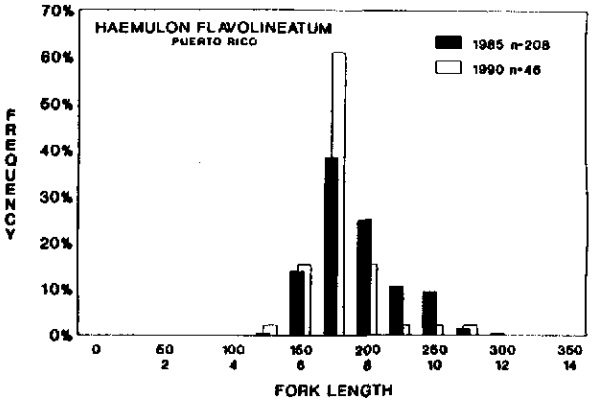

SCARUS TAENIOPTERUS
PUERTO RICO
1990 n=64
FREQUENCY
80%
50%
40%
30%
20%
10%
0%
0 50 100 150 200 250 300 350 400
2 4 6 8 10 12 14 16
FORK LENGTH

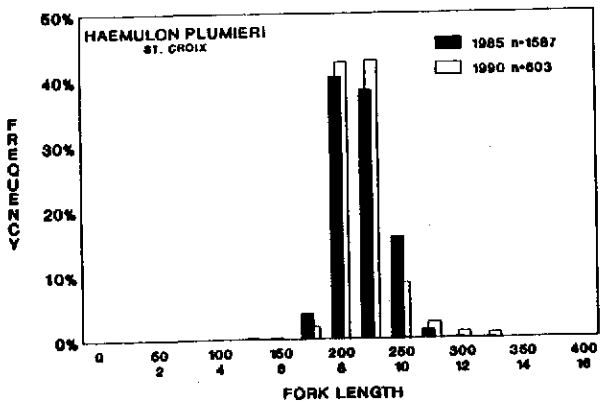

POMADASYS CROCRO
ST. CROIX
1990 n=45
FREQUENCY
60%
50%
40%
30%
20%
10%
0%
0 50 100 150 200 250 300 350
2 4 6 8 10 12 14
FORK LENGTH

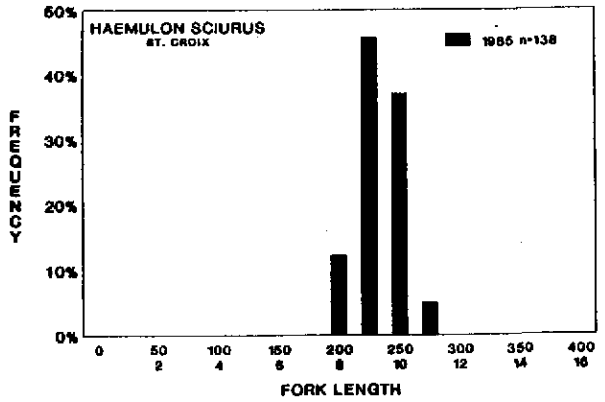

SCARUS TAENIOPTERUS
ST. CROIX
1985 n=157
1990 n=49
FREQUENCY
80%
60%
40%
20%
0%
0 50 100 150 200 250 300 350 400
2 4 6 8 10 12 14 16
FORK LENGTH

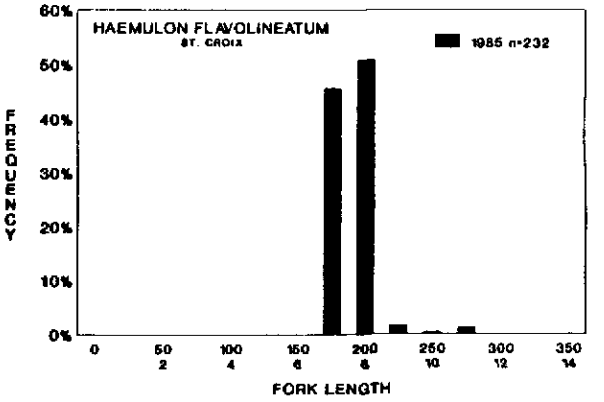

HAEMULON PLUMIERI
PUERTO RICO
1985 n=1092
1990 n=2649
FREQUENCY
FORK LENGTH

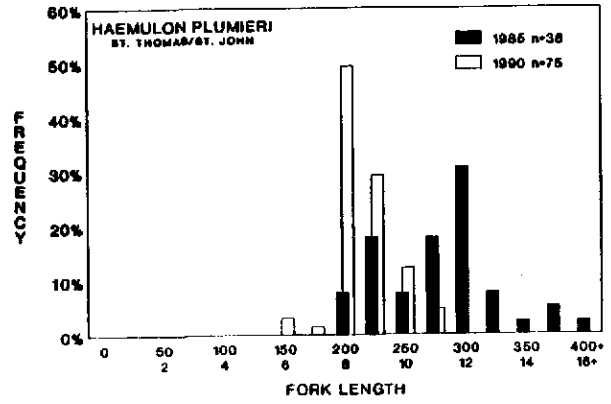

HAEMULON SCIURUS
PUERTO RICO
1985 n=141
1990 n=358
FREQUENCY
FORK LENGTH

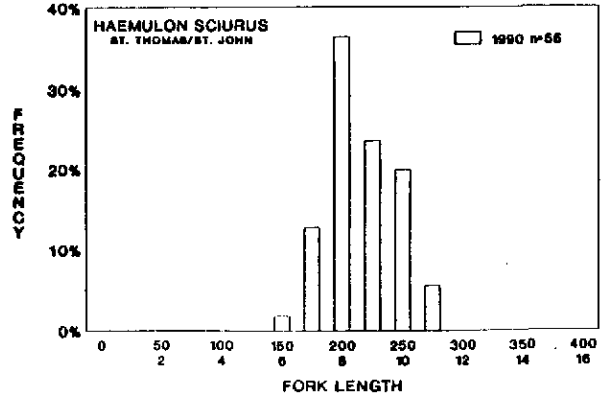

HAEMULON FLAVOLINEATUM
PUERTO RICO
1985 n=208
1990 n=46
FREQUENCY
FORK LENGTH


HAEMULON PLUMIERI
ST. CROIX
1985 n=1587
1990 n=603
FREQUENCY
FORK LENGTH


HAEMULON SCIURUS
ST. CROIX
1985 n=138
FREQUENCY
FORK LENGTH


HAEMULON FLAVOLINEATUM
ST. CROIX
1985 n=232
FREQUENCY
FORK LENGTH


HAEMULON PLUMIERI
ST. THOMAS/ST. JOHN
1985 n=36
1990 n=75
FREQUENCY
FORK LENGTH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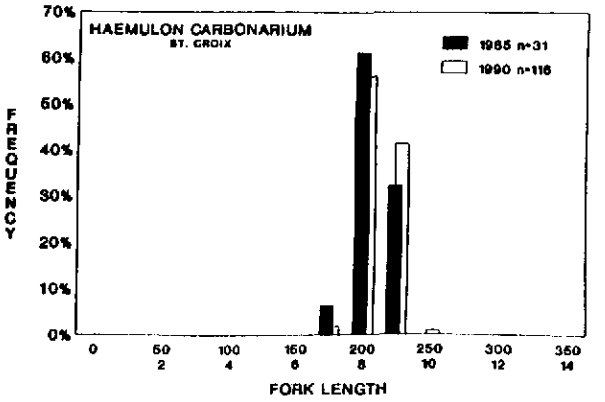
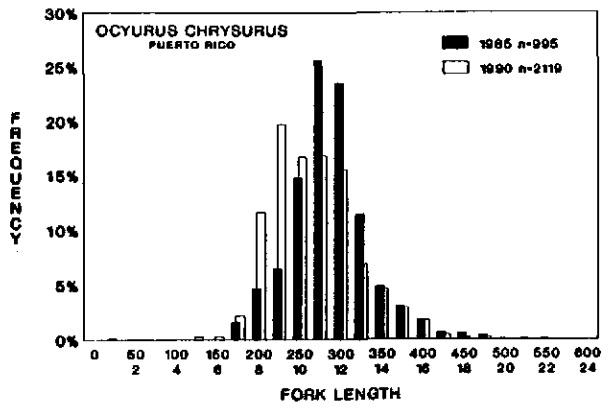
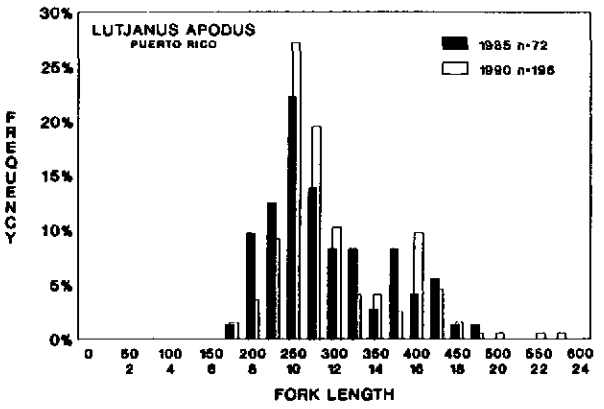
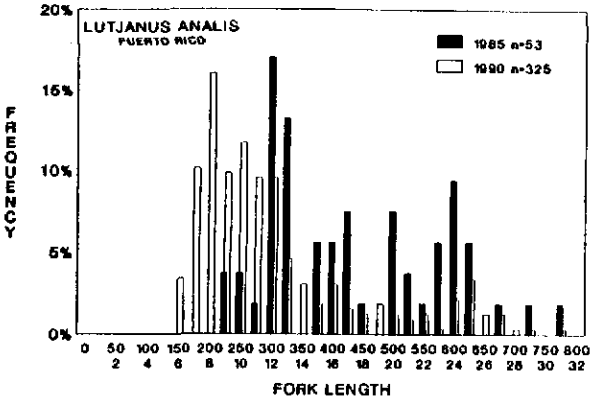
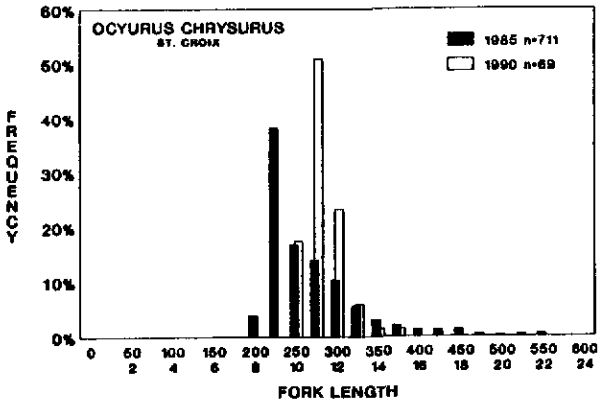
ST. THOMAS/ST. JOHN
1990 n=56
FREQUENCY
FORK LENGTH


HAEMULON CARBONARIUM
ST. CROIX
1985 n=31
1990 n=116
FREQUENCY
FORK LENGTH


OCYURUS CHRYSURUS
PUERTO RICO
1985 n=995
1990 n=2119
FREQUENCY
FORK LENGTH


LUTJANUS APODUS
PUERTO RICO
1985 n=72
1990 n=196
FREQUENCY
FORK LENGTH


LUTJANUS ANALIS
PUERTO RICO
1985 n=53
1990 n=325
FREQUENCY
FORK LENGTH


OCYURUS CHRYSURUS
ST. CROIX
1985 n=711
1990 n=69
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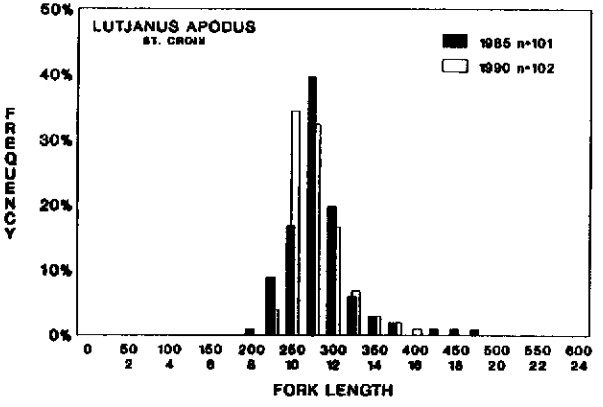
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ST. CROIX
1985 n=101
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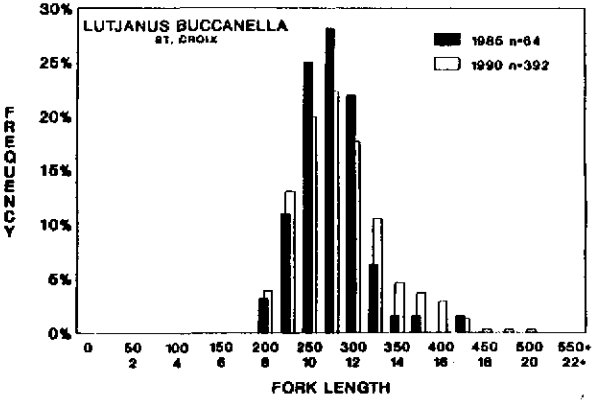
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ST. CROIX
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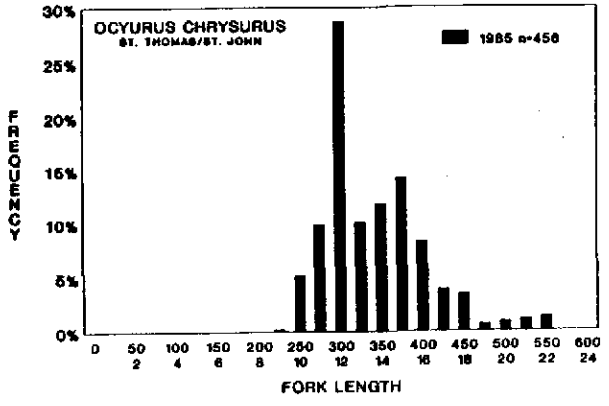
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ST. THOMAS/ST. JOHN
1985 n=456
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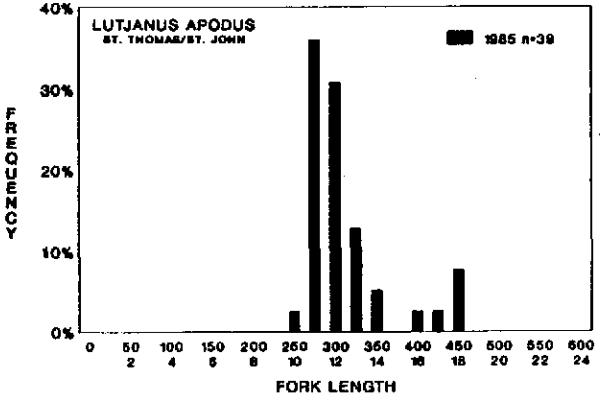
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ST. THOMAS/ST. JOHN
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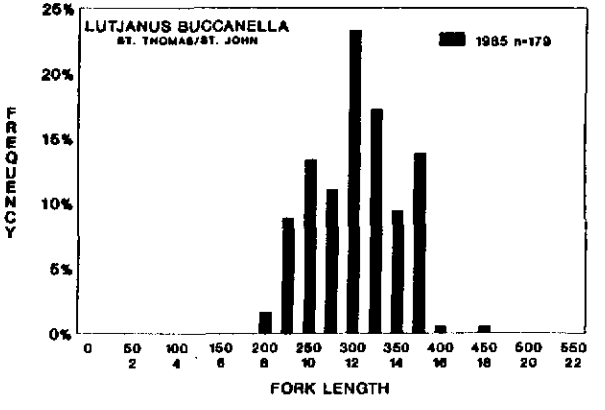
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ST. THOMAS/ST. JOHN
1985 n=179
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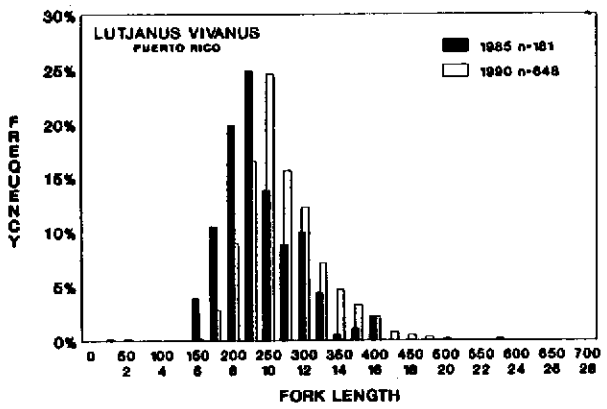
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PUERTO RICO
1985 n=181
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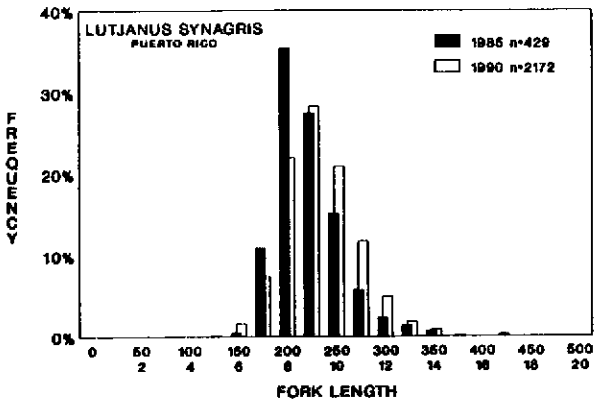
LUTJANUS SYNAGRIS
PUERTO RICO
1985 n=429
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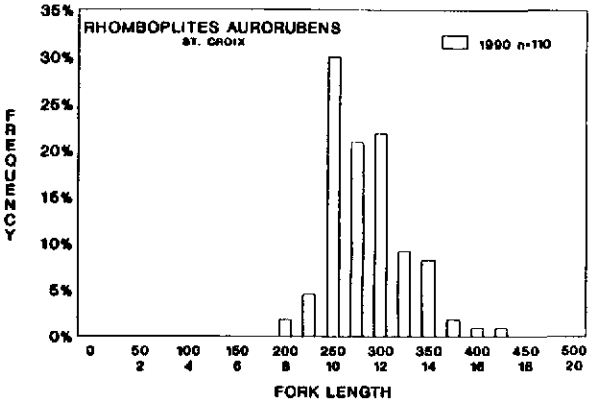
RHOMBOPLITES AURORUBENS
ST. CROIX
1990 n=110
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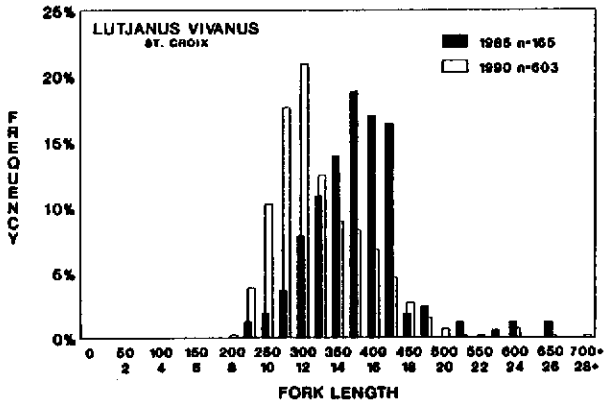
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ST. CROIX
1985 n=165
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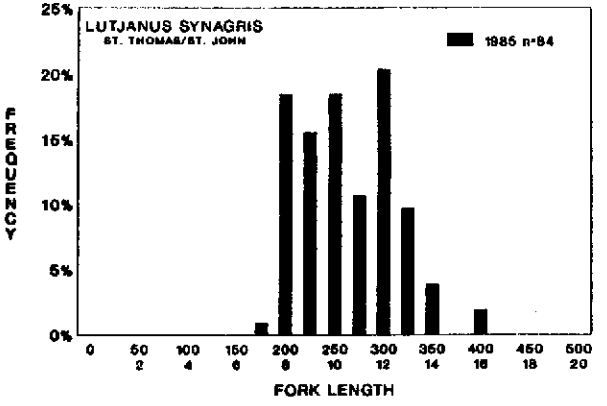
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ST. THOMAS/ST. JOHN
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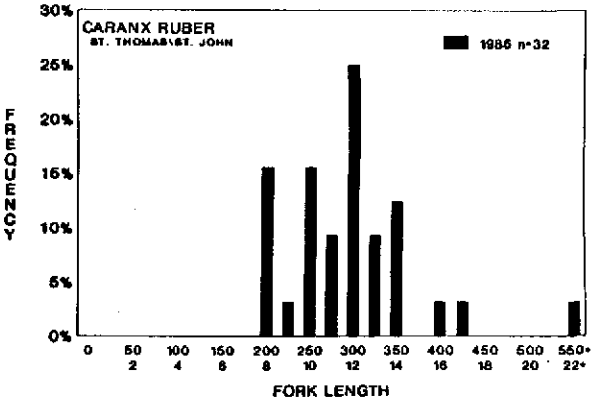
CARANX RUBER
ST. THOMAS\ST. JOHN
1985 n=32
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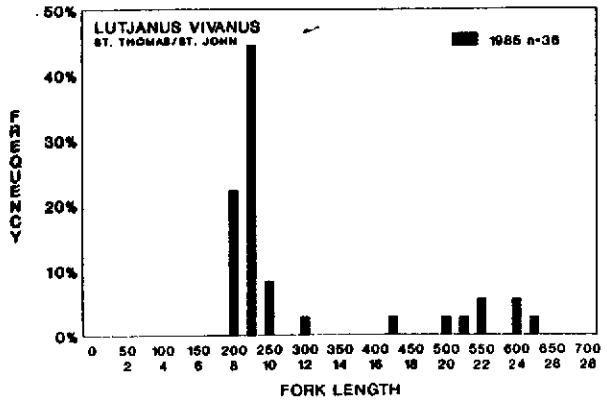
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ST. THOMAS/ST. JOHN
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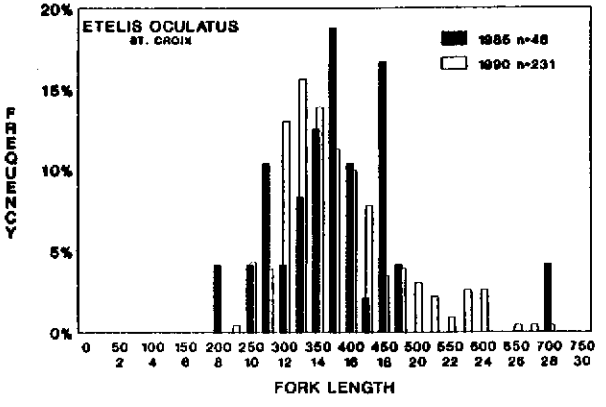
ETELIS OCULATUS
ST. CROIX
1985 n=46
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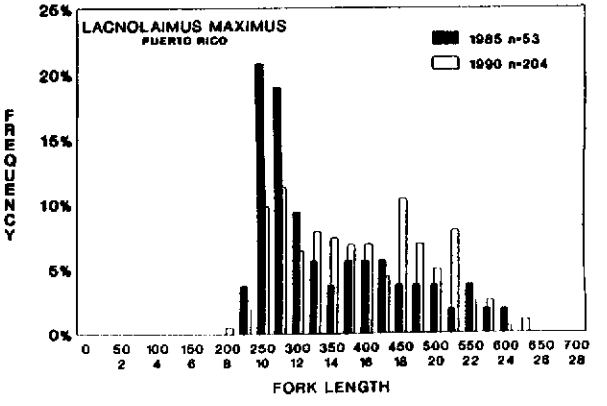
LACNOLAIMUS MAXIMUS
PUERTO RICO
1985 n=53
1990 n=204
FREQUENCY
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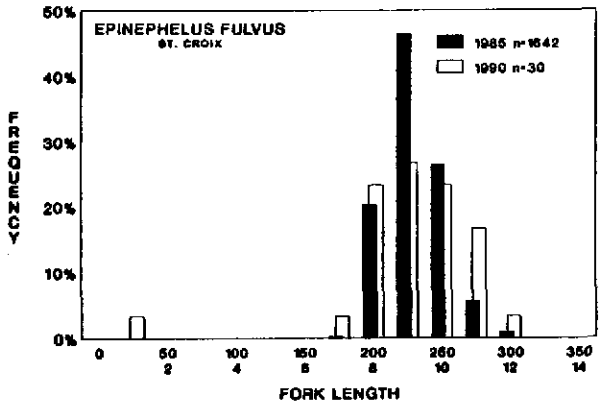
EPINEPHELUS FULVUS
ST. CROIX
1985 n=1642
1990 n=30
FREQUENCY
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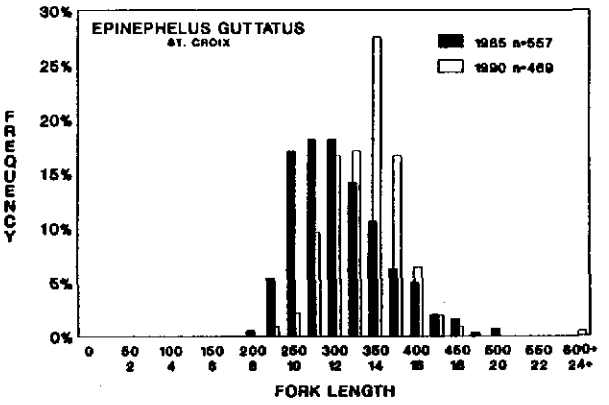
EPINEPHELUS GUTTATUS
ST. CROIX
1985 n=557
1990 n=469
FREQUENCY
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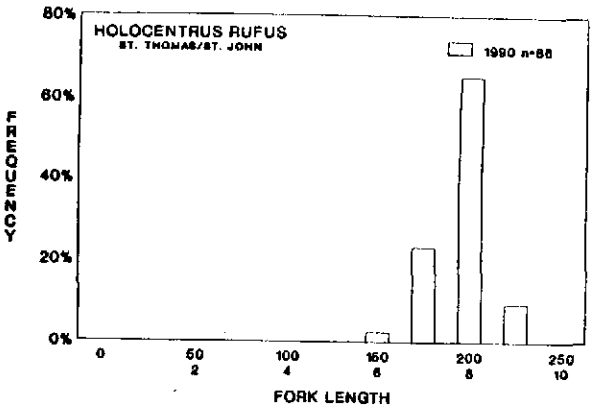
HOLOCENTRUS RUFUS
ST. THOMAS/ST. JOHN
1990 n=88
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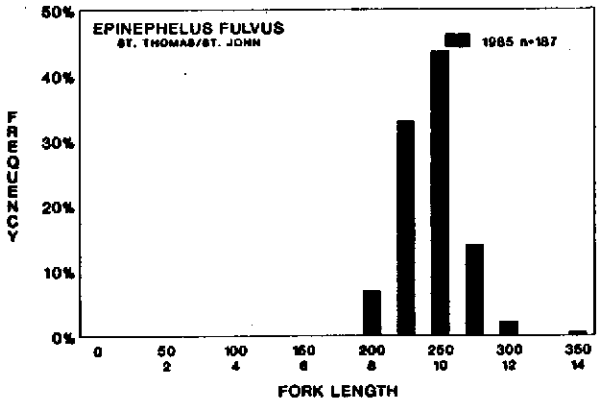
EPINEPHELUS FULVUS
ST. THOMAS/ST. JOHN
1985 n=187
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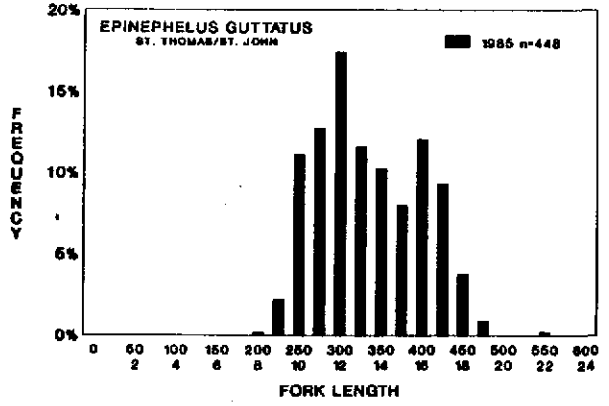
EPINEPHELUS GUTTATUS
ST. THOMAS/ST. JOHN
1985 n=448
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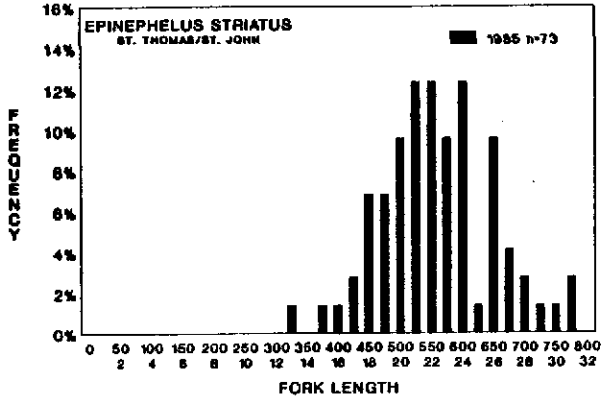
EPINEPHELUS STRIATUS
ST. THOMAS/ST. JOHN
1985 n=73
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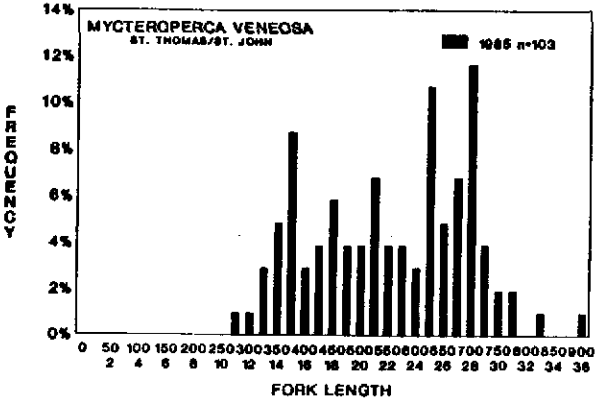
MYCTEROPERCA VENEOSA
ST. THOMAS/ST. JOHN
1985 n=103
FREQUENCY
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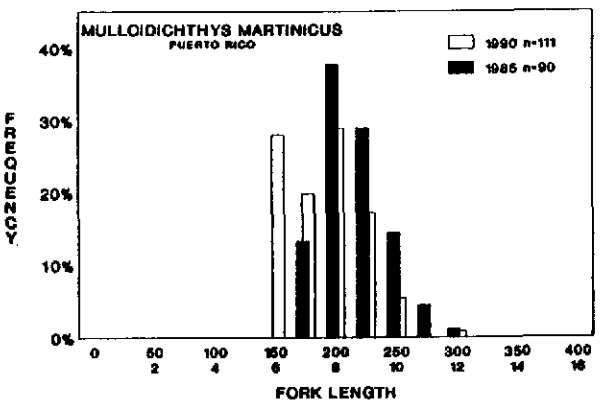
MULLOIDICHTHYS MARTINICUS
PUERTO RICO
1990 n=111
1985 n=90
FREQUENCY
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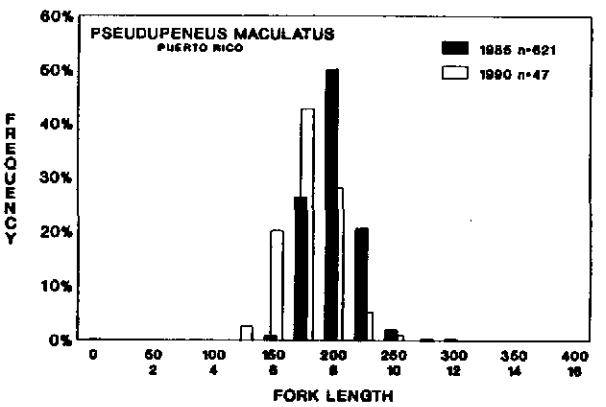
PSEUDUPENEUS MACULATUS
PUERTO RICO
1985 n=621
1990 n=47
FREQUENCY
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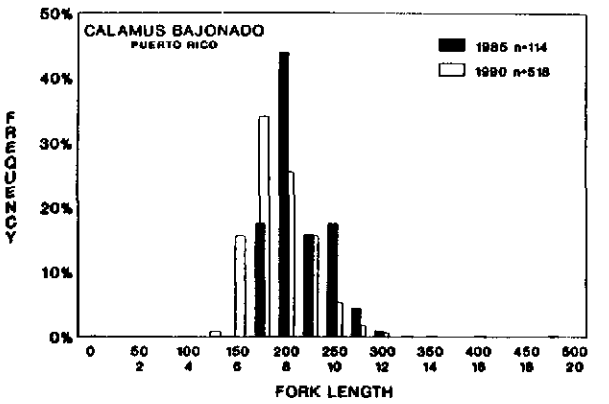
CALAMUS BAJONADO
PUERTO RICO
1985 n=114
1990 n=518
FREQUENCY
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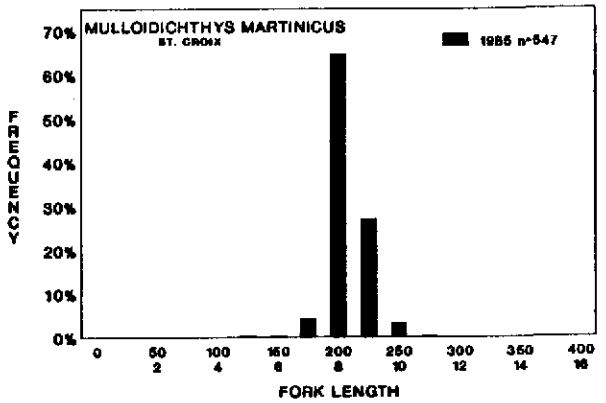
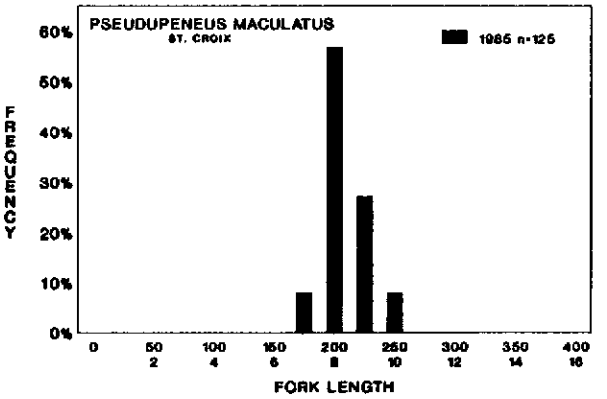
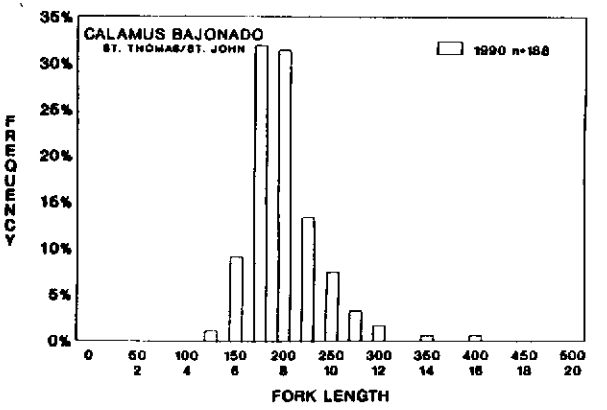
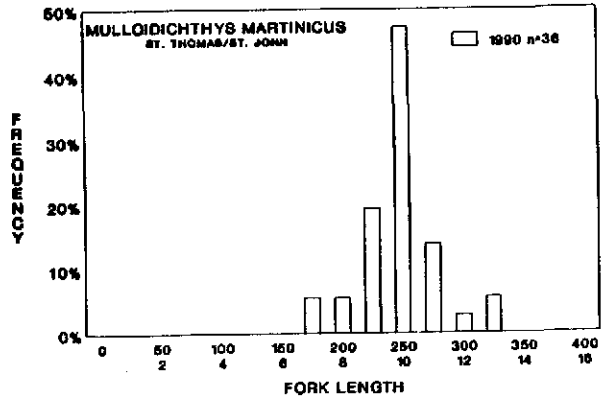
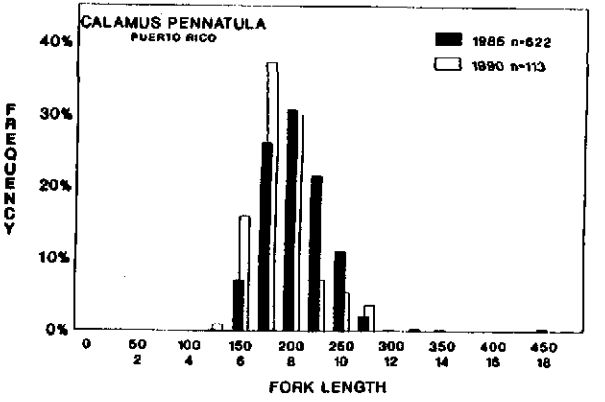
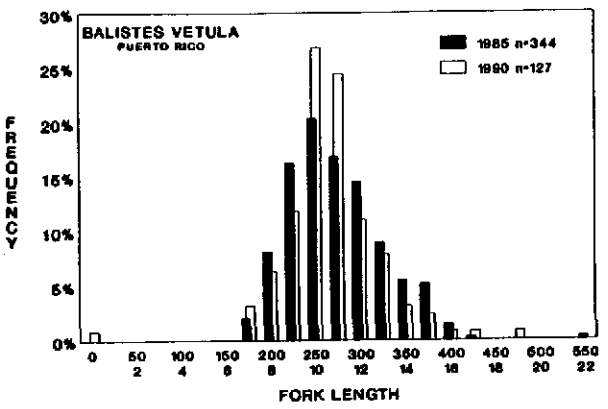

MULLOIDICHTHYS MARTINICUS
ST. CROIX
1985 n=547
FREQUENCY
FORK LENGTH


PSEUDUPENEUS MACULATUS
ST. CROIX
1985 n=125
FREQUENCY
FORK LENGTH


CALAMUS BAJONADO
ST. THOMAS/ST. JOHN
1990 n=188
FREQUENCY
FORK LENGTH


MULLOIDICHTHYS MARTINICUS
ST. THOMAS/ST. JOHN
1990 n=36
FREQUENCY
FORK LENGTH


CALAMUS PENNATULA
PUERTO RICO
1985 n=622
1990 n=113
FREQUENCY
FORK LENGTH


BALISTES VETULA
PUERTO RICO
1985 n=344
1990 n=127
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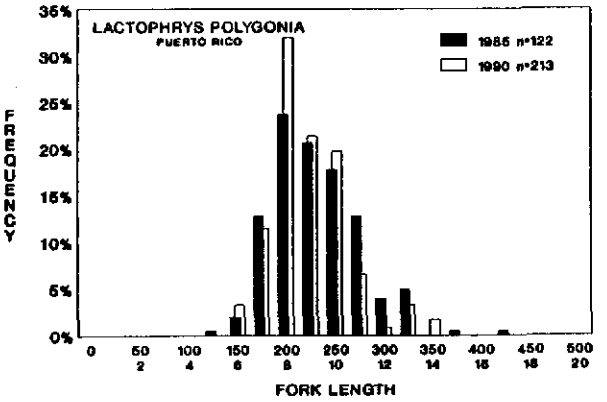
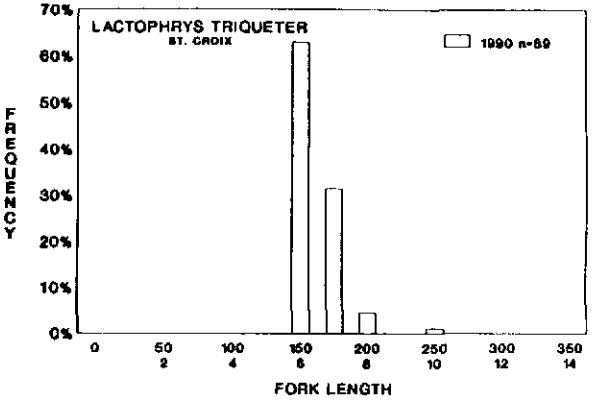

LACTOPHRYS POLYGONIA
PUERTO RICO
1985 n=122
1990 n=213
FREQUENCY
FORK LENGTH


LACTOPHRYS TRIQUETER
ST. CROIX
1990 n=89
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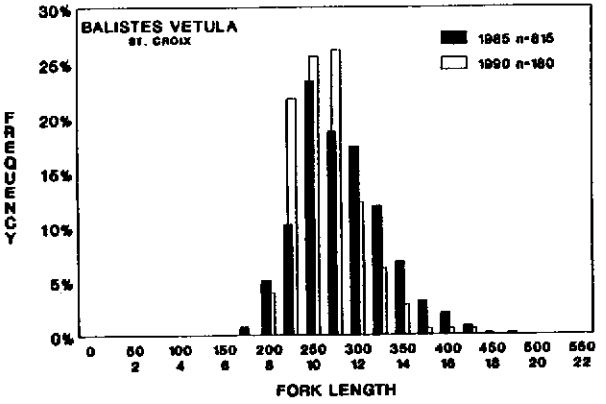
FORK LENGTH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ST. CROIX
1985 n=815
1990 n=180
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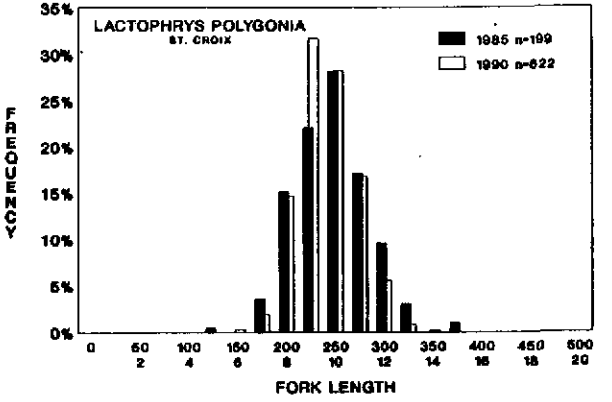
LACTOPHRYS POLYGONIA
ST. CROIX
1985 n=199
1990 n=622
FREQUENCY
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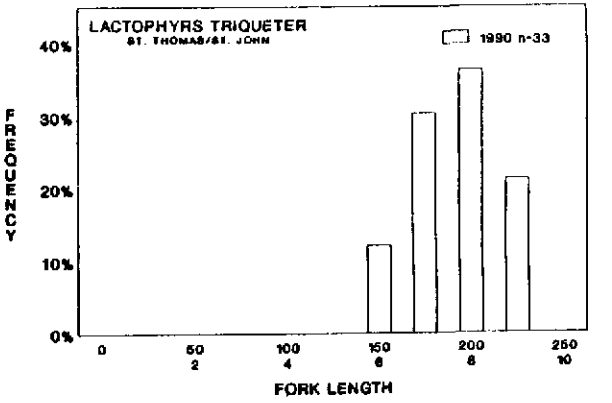
LACTOPHYRS TRIQUETER
ST. THOMAS/ST. JOHN
1990 n=33
FREQUENCY
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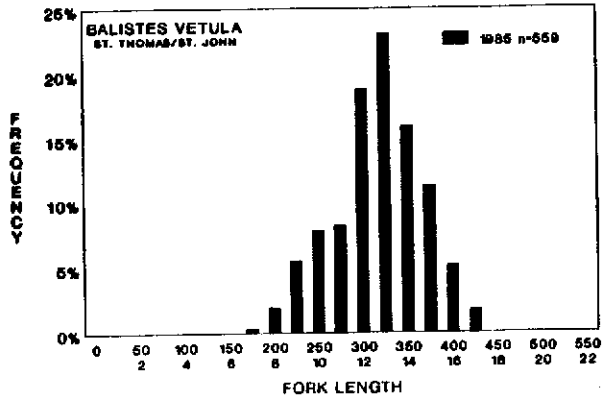
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ST. THOMAS/ST. JOHN
1985 n=659
FREQUENCY
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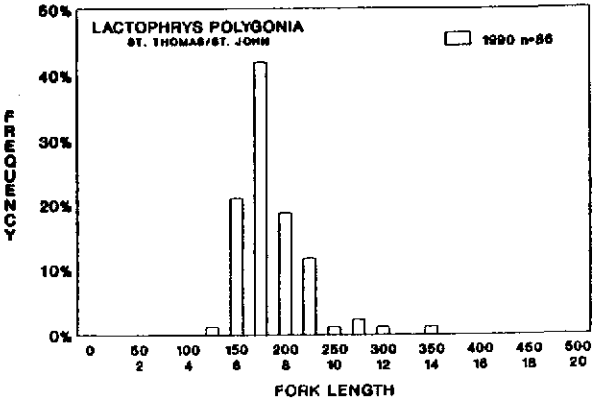
LACTOPHRYS POLYGONIA
ST. THOMAS/ST. JOHN
1990 n=86
FREQUENCY
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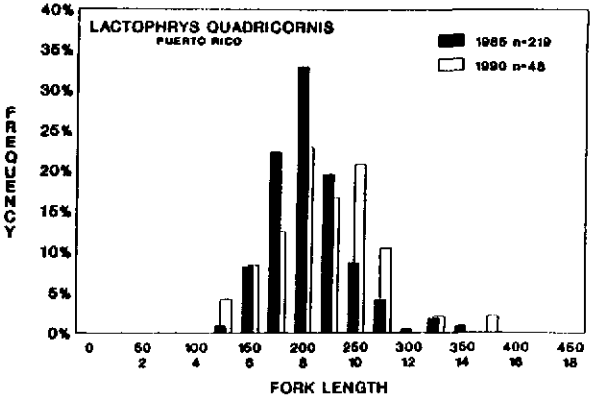
LACTOPHRYS QUADRICORNIS
PUERTO RICO
1985 n=219
1990 n=48
FREQUENCY
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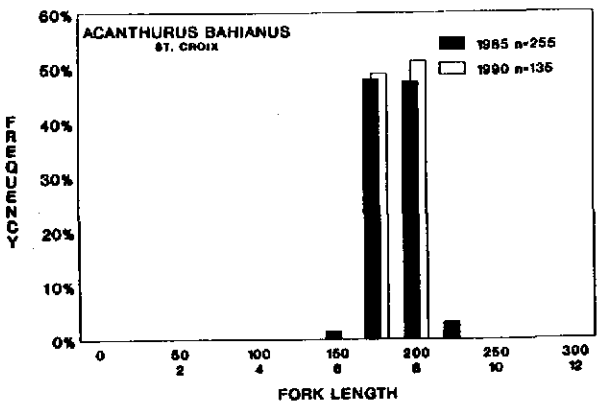
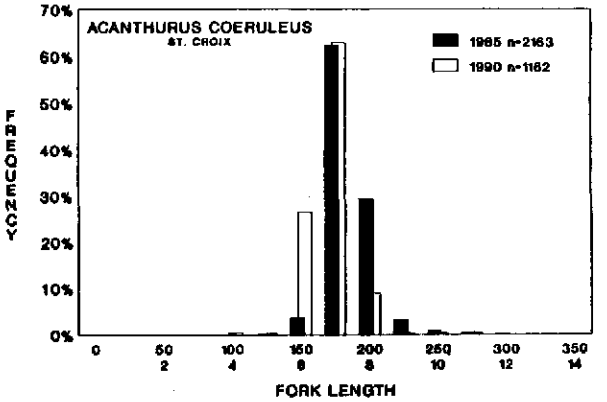
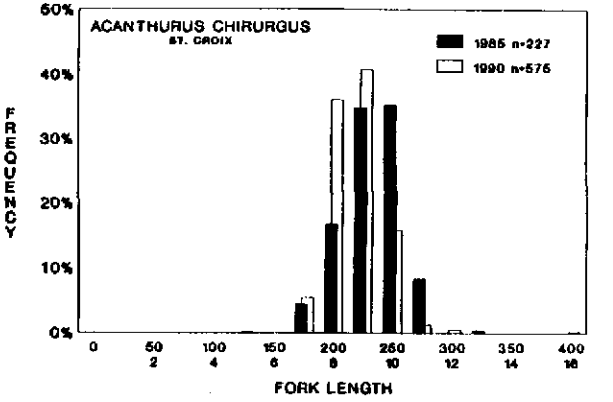

ACANTHURUS BAHIANUS
ST. CROIX
1985 n=255
1990 n=135
FREQUENCY
FORK LENGTH


ACANTHURUS COERULEUS
ST. CROIX
1985 n=2163
1990 n=1162
FREQUENCY
FORK LENGTH


ACANTHURUS CHIRURGUS
ST. CROIX
1985 n=227
1990 n=575
FREQUENCY
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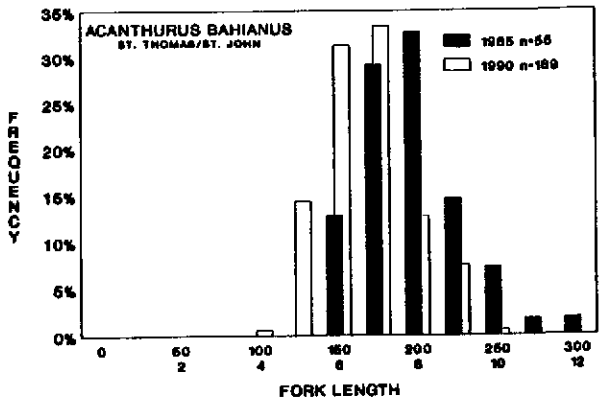
ACANTHURUS BAHIANUS
ST. THOMAS/ST. JOHN
1985 n=55
1990 n=189
FREQUENCY
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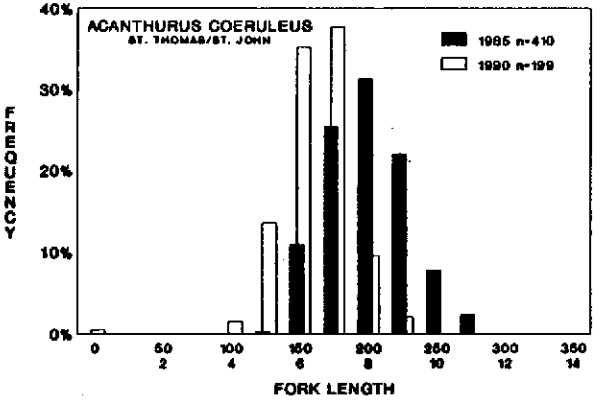
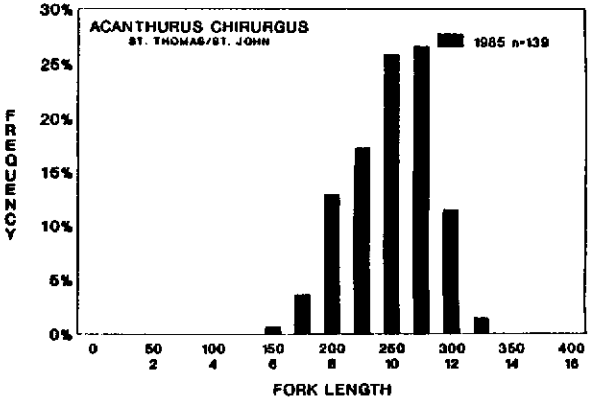

ACANTHURUS COERULEUS
ST. THOMAS/ST. JOHN
1985 n=410
1990 n=199
FREQUENCY
FORK LENGTH


ACANTHURUS CHIRURGUS
ST. THOMAS/ST. JOHN
1985 n=139
FREQUENCY
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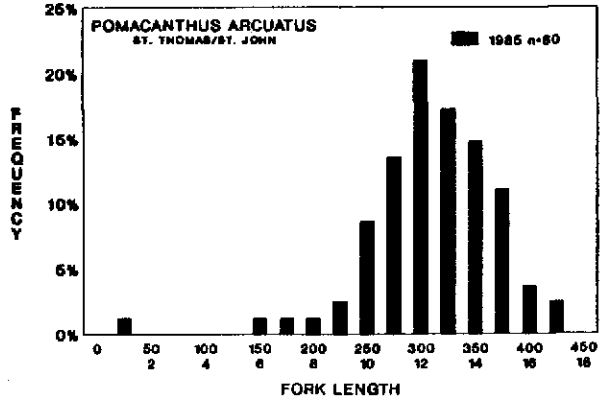
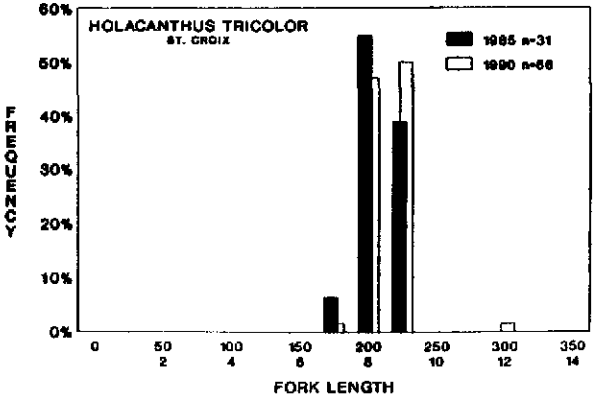
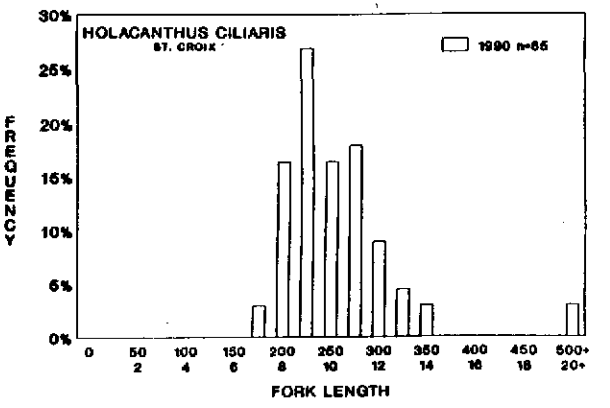
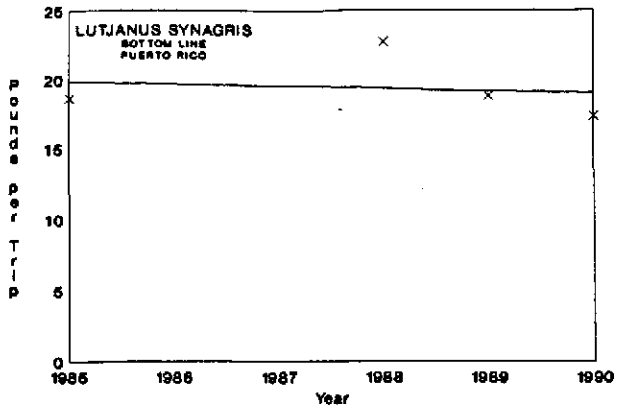
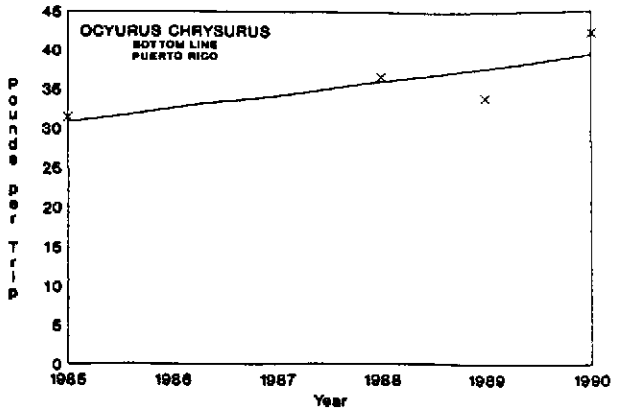

POMACANTHUS ARCUATUS
ST. THOMAS/ST. JOHN
1985 n=60
FREQUENCY
FORK LENGTH

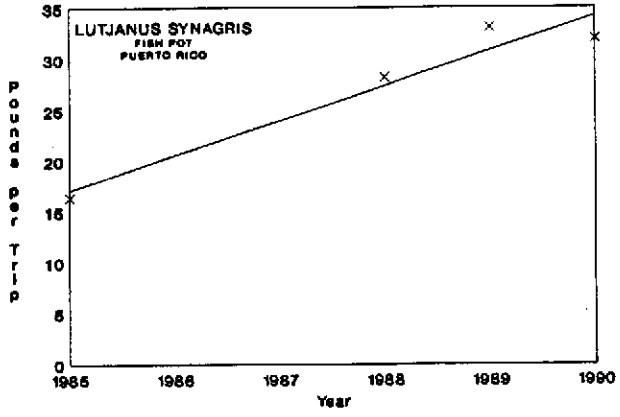

HOLACANTHUS TRICOLOR
ST. CROIX
1985 n=31
1990 n=66
FREQUENCY
FORK LENGTH

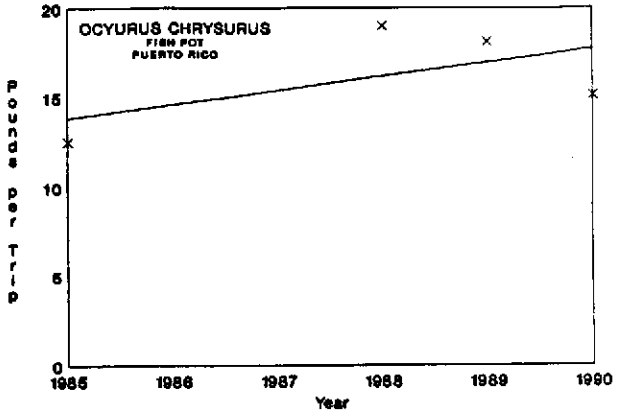

HOLACANTHUS CILIARIS
ST. CROIX
1990 n=66
FREQUENCY
FORK LENGTH

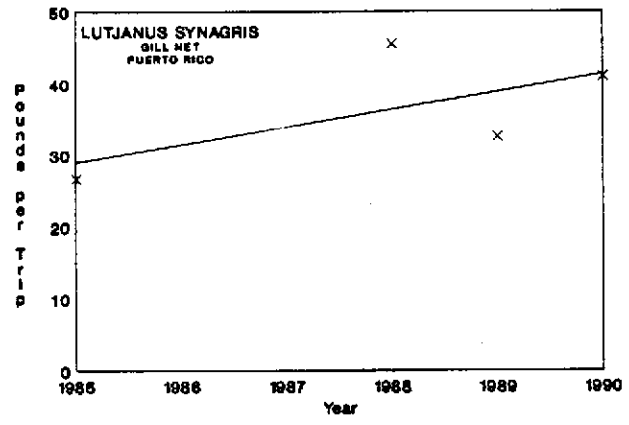
Appendix B. Trends in catch-per-unit effort for species by gear type. Simple linear trends were fit to the data and plotted courtesy of the CFMC. Trend lines are shown although too few years of data were available to justify the testing of statistical significance of the trends.

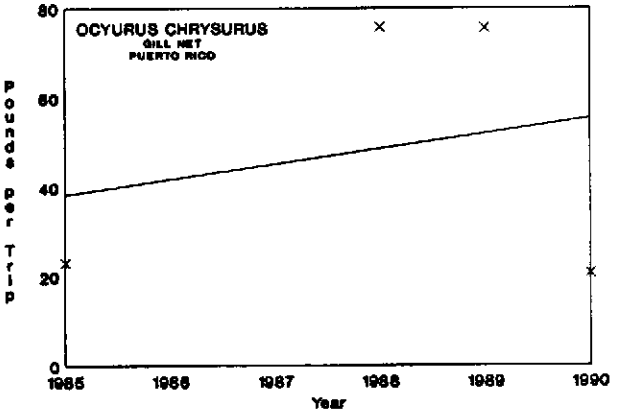

LUTJANUS SYNAGRIS
BOTTOM LINE
PUERTO RICO
Pounds per Trip
Year
0
5
10
15
20
25
1985
1986
1987
1988
1989
1990

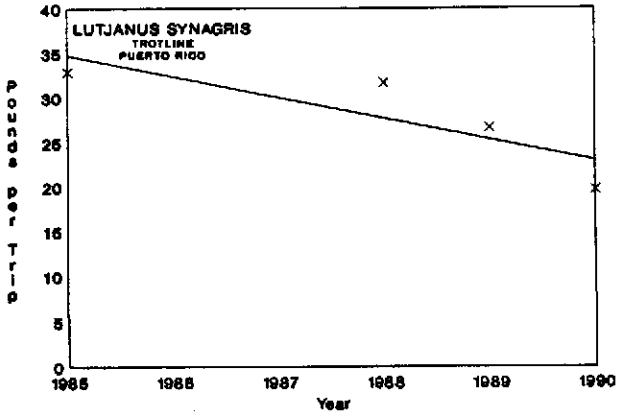

OCYURUS CHRYSURUS
BOTTOM LINE
PUERTO RICO
Pounds per Trip
Year
0
5
10
15
20
25
30
35
40
45
1985
1986
1987
1988
1989
1990

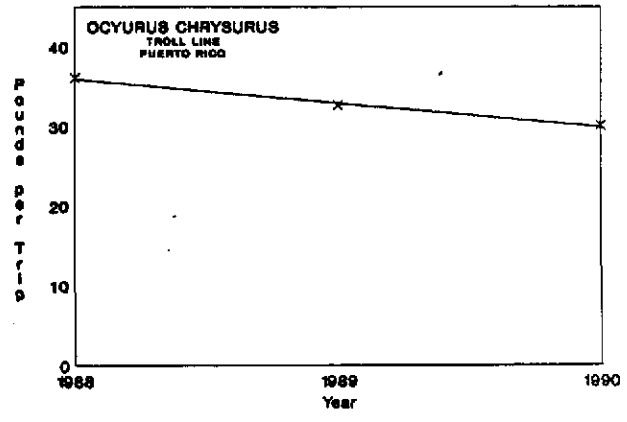

LUTJANUS SYNAGRIS
FISH POT
PUERTO RICO
Pounds per Trip
Year
0
5
10
15
20
25
30
35
1985
1986
1987
1988
1989
1990

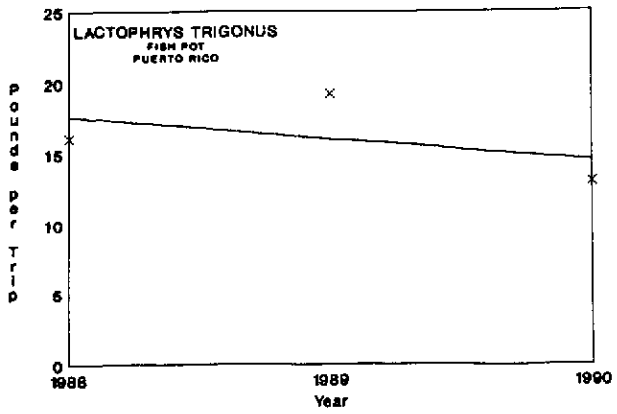

OCYURUS CHRYSURUS
FISH POT
PUERTO RICO
Pounds per Trip
Year
0
5
10
15
20
1985
1986
1987
1988
1989
1990

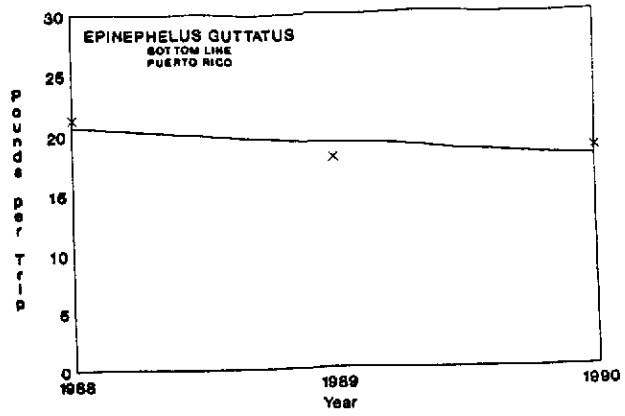

LUTJANUS SYNAGRIS
GILL NET
PUERTO RICO
Pounds per Trip
Year
0
10
20
30
40
50
1985
1986
1987
1988
1989
1990

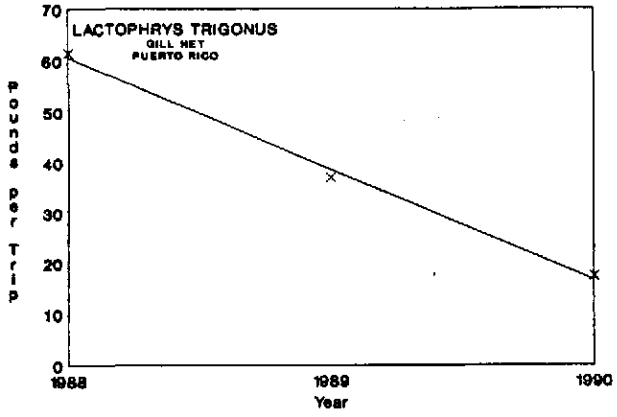

OCYURUS CHRYSURUS
GILL NET
PUERTO RICO
Pounds per Trip
Year
0
20
40
60
80
1985
1986
1987
1988
1989
1990

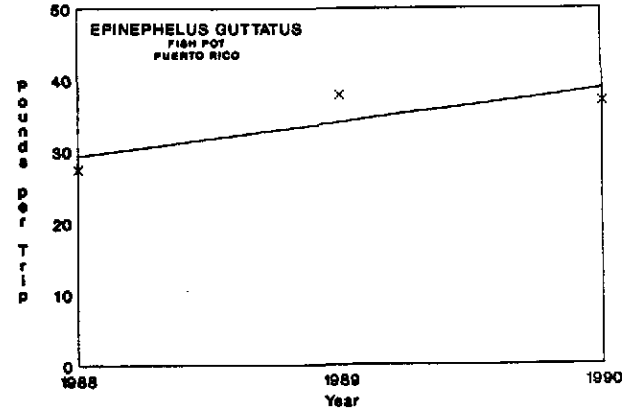

LUTJANUS SYNAGRIS
TROTLINE
PUERTO RICO
Pounds per Trip
Year
0
5
10
15
20
25
30
35
40
1985
1986
1987
1988
1989
1990

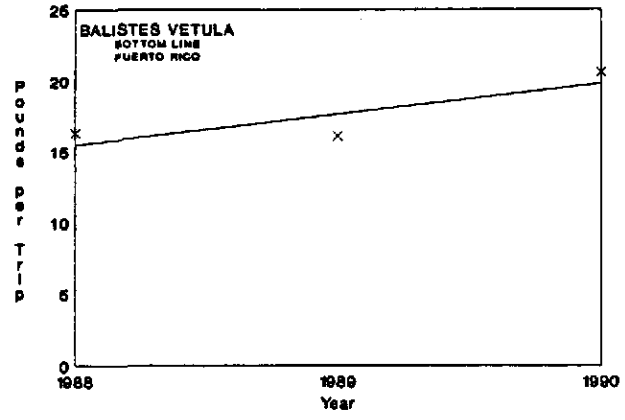

OCYURUS CHRYSURUS
TROLL LINE
PUERTO RICO
Pounds per Trip
Year
0
10
20
30
40
1988
1989
1990

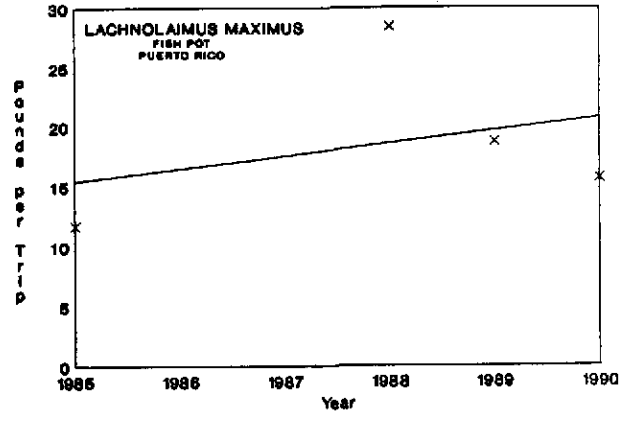

LACTOPHRYS TRIGONUS
FISH POT
PUERTO RICO
pounds per Trip
0
5
10
15
20
25
1988
1989
1990
Year

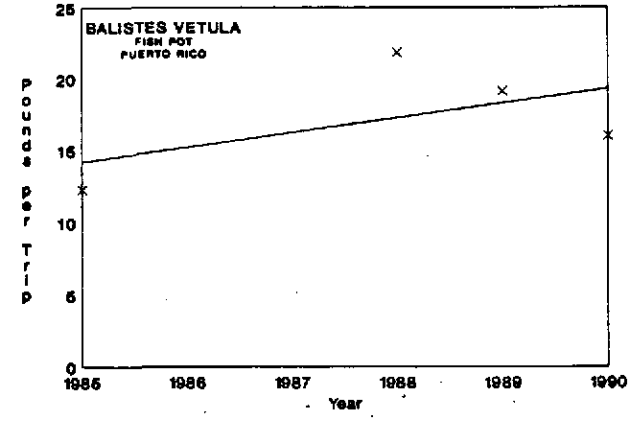

EPINEPHELUS GUTTATUS
BOTTOM LINE
PUERTO RICO
pounds per Trip
0
5
10
15
20
25
30
1988
1989
1990
Year

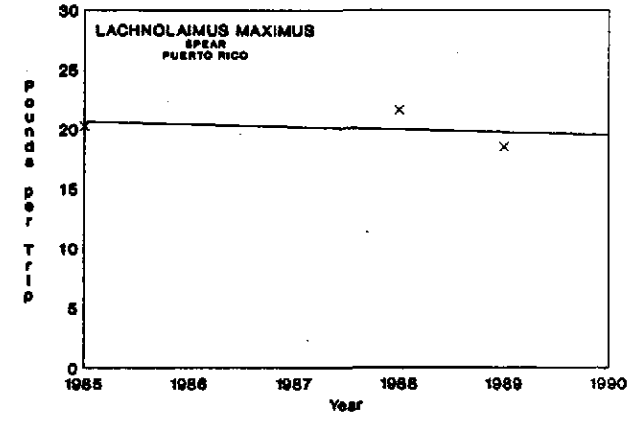

LACTOPHRYS TRIGONUS
GILL NET
PUERTO RICO
pounds per Trip
0
10
20
30
40
50
60
70
1988
1989
1990
Year

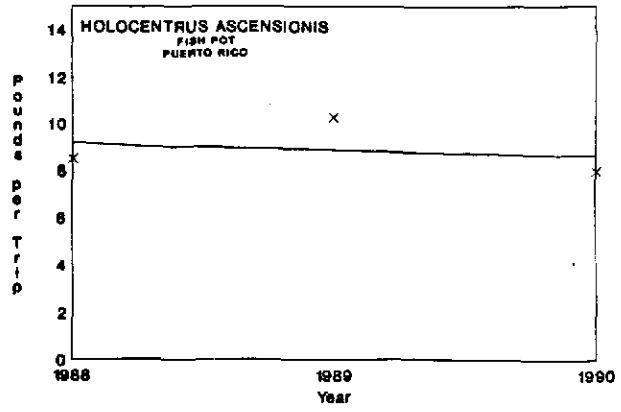

EPINEPHELUS GUTTATUS
FISH POT
PUERTO RICO
pounds per Trip
0
10
20
30
40
50
1988
1989
1990
Year

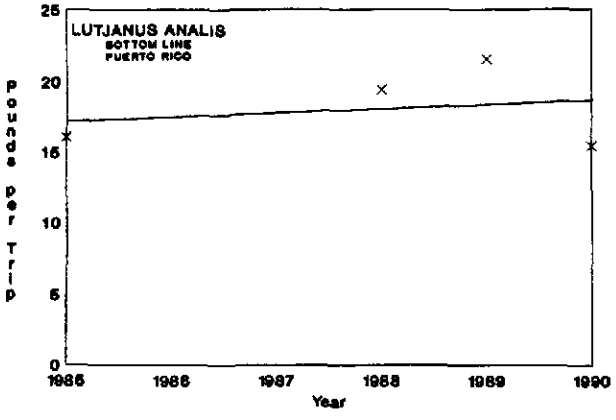

BALISTES VETULA
BOTTOM LINE
PUERTO RICO
pounds per Trip
0
5
10
15
20
25
1988
1989
1990
Year

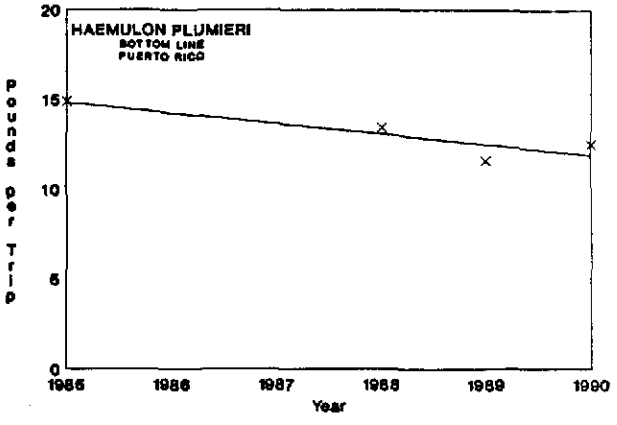

LACHNOLAIMUS MAXIMUS
FISH POT
PUERTO RICO
pounds per Trip
0
5
10
15
20
25
30
1985
1986
1987
1988
1989
1990
Year

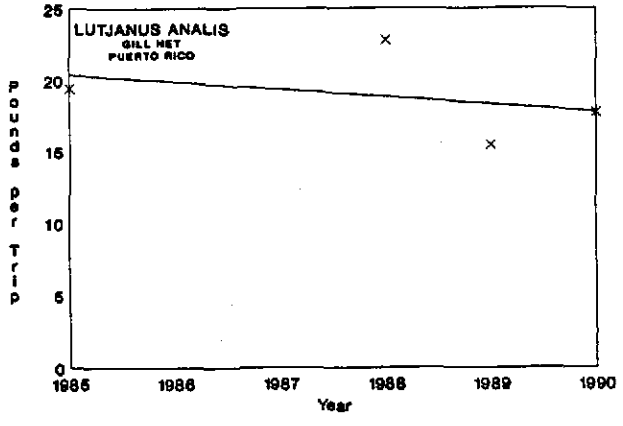

BALISTES VETULA
FISH POT
PUERTO RICO
pounds per Trip
0
5
10
15
20
25
1985
1986
1987
1988
1989
1990
Year

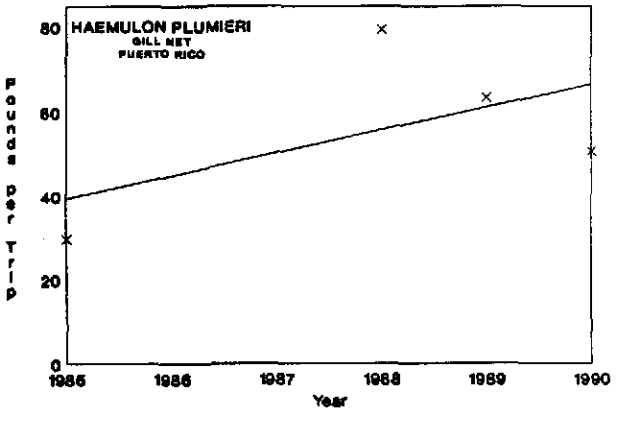

LACHNOLAIMUS MAXIMUS
SPEAR
PUERTO RICO
pounds per Trip
0
5
10
15
20
25
30
1985
1986
1987
1988
1989
1990
Year

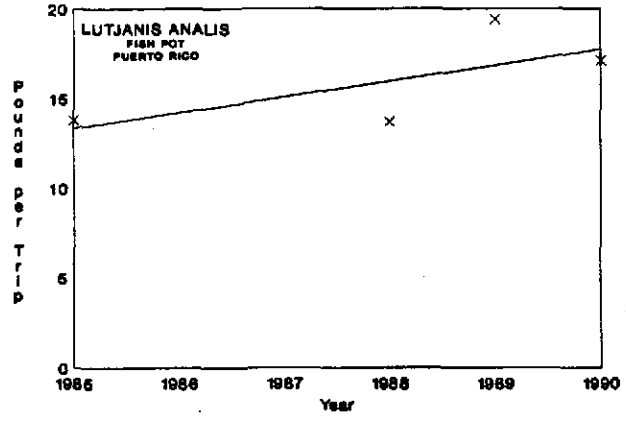

HOLOCENTRUS ASCENSIONIS
FISH POT
PUERTO RICO
Pounds per Trip
0
2
4
6
8
10
12
14
1988
1989
1990
Year

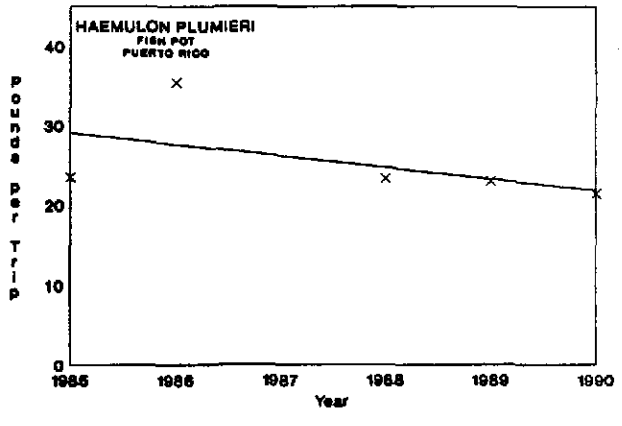

LUTJANUS ANALIS
BOTTOM LINE
PUERTO RICO
Pounds per Trip
0
5
10
15
20
25
1985
1986
1987
1988
1989
1990
Year

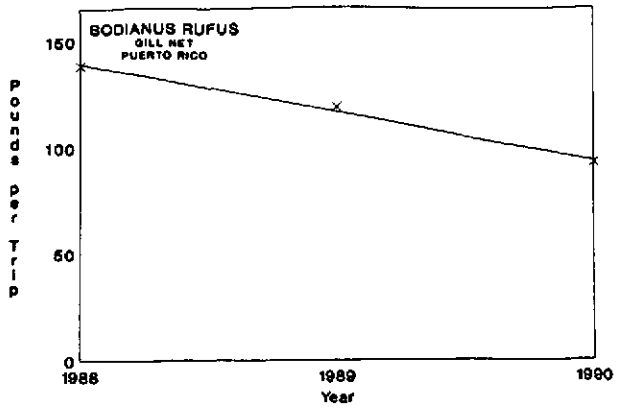

HAEMULON PLUMIERI
BOTTOM LINE
PUERTO RICO
Pounds per Trip
0
5
10
15
20
1985
1986
1987
1988
1989
1990
Year

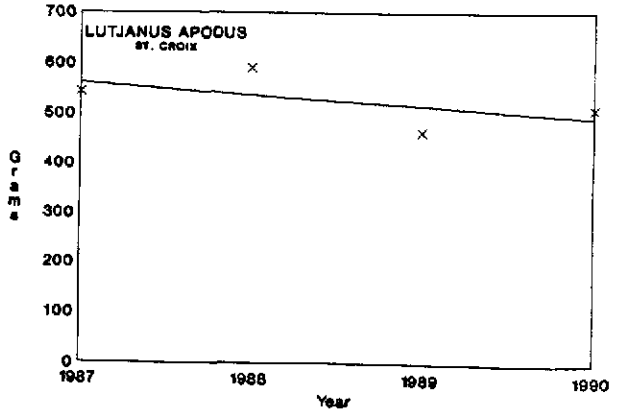

LUTJANUS ANALIS
GILL NET
PUERTO RICO
Pounds per Trip
0
5
10
15
20
25
1985
1986
1987
1988
1989
1990
Year

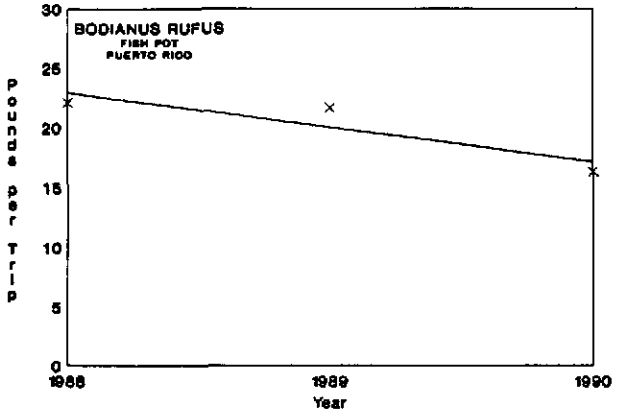

HAEMULON PLUMIERI
GILL NET
PUERTO RICO
Pounds per Trip
0
20
40
60
80
1985
1986
1987
1988
1989
1990
Year

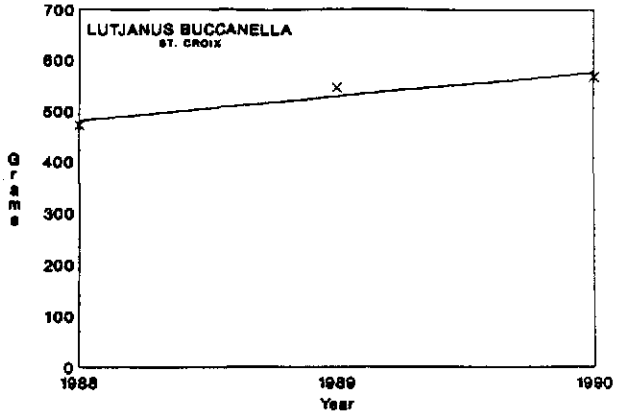

LUTJANIS ANALIS
FISH POT
PUERTO RICO
Pounds per Trip
0
5
10
15
20
1985
1986
1987
1988
1989
1990
Year

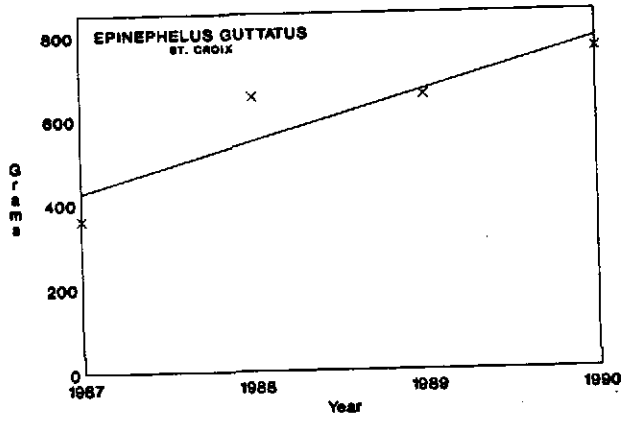

HAEMULON PLUMIERI
FISH POT
PUERTO RICO
Pounds per Trip
0
10
20
30
40
1985
1986
1987
1988
1989
1990
Year

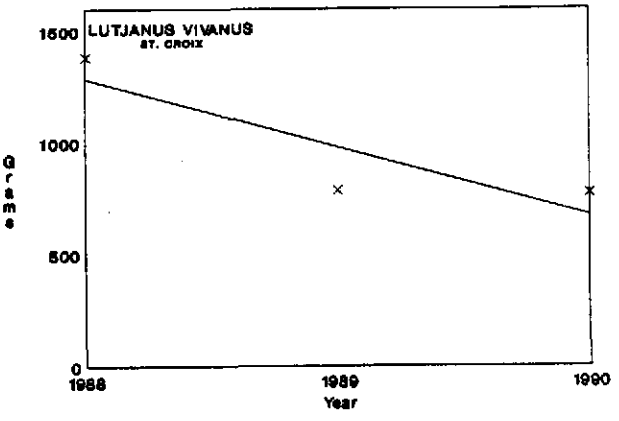

BODIANUS RUFUS
GILL NET
PUERTO RICO
Pounds per Trip
150
100
50
0
1988
1989
1990
Year

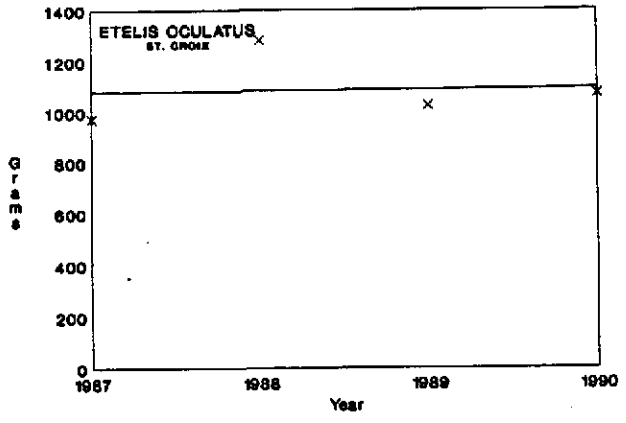

LUTJANUS APODUS
ST. CROIX
Grams
700
600
500
400
300
200
100
0
1987
1988
1989
1990
Year

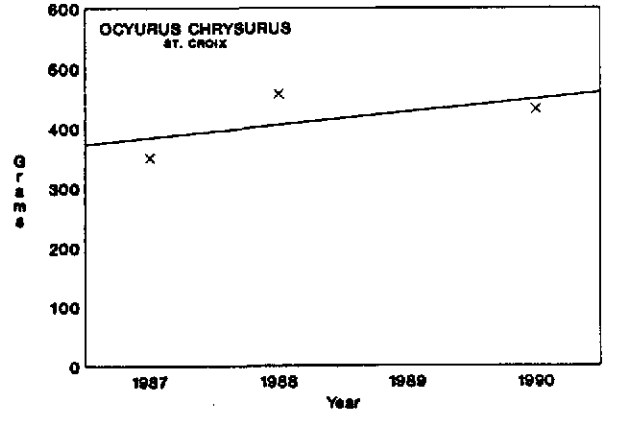

BODIANUS RUFUS
FISH POT
PUERTO RICO
Pounds per Trip
30
25
20
15
10
5
0
1988
1989
1990
Year


LUTJANUS BUCCANELLA
ST. CROIX
Grams
700
600
500
400
300
200
100
0
1988
1989
1990
Year


EPINEPHELUS GUTTATUS
ST. CROIX
Grams
800
600
400
200
0
1987
1988
1989
1990
Year


LUTJANUS VIVANUS
ST. CROIX
Grams
1500
1000
500
0
1988
1989
1990
Year


ETELIS OCULATUS
ST. CROIX
Grams
1400
1200
1000
800
600
400
200
0
1987
1988
1989
1990
Year


OCYURUS CHRYSURUS
ST. CROIX
Grams
600
600
400
300
200
100
0
1987
1988
1989
1990
Year