FINAL REPORT TO

NOAA

THE NATIONAL MARINE FISHERIES SERVICE

"A STUDY OF THE POPULATION ECOLOGY OF IN-WATER MARINE TURTLE POPULATIONS ON THE EAST-CENTRAL FLORIDA COAST, IN 1997-98"

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INTRODUCTION

The UCF Marine Turtle Research Group (L. M. Ehrhart, P.I.) began to study the population ecology of immature green turtles and loggerheads in the northern reach of the Indian River Lagoon (IRL) system (Mosquito Lagoon) in 1975. Together with Larry Ogren of NMFS (who worked primarily on the Gulf coast of Florida), Ehrhart and the UCF group pioneered the use of large-mesh tangle nets for the live capture of marine turtles, in order to study the structure and relative density of wild populations. Using the techniques first developed in the northern region of the IRL between 1975 and 1981, the UCF group shifted its net-capture work to the central region of the system, near Sebastian Inlet, in 1982. That work has continued, at varying levels of effort, to the present day. In 1989 the tangle net method was modified and adapted for use over the worm-rock reefs in the near-shore Atlantic waters off Indian River County, Florida.

Prior to the period from June, 1995 through May, 1996, none of the "in-water" research on the reefs or in the lagoon had been supported by external grants or contracts. Throughout the early to mid-1980's the levels of effort (and therefore sample sizes) were relatively high, especially in the summers, but from 1989 to 1995 deterioration of equipment and declines in levels of support saw to it that our efforts to study these populations fell off markedly. The work continued at minimal levels in the summers, when student assistants could be conscripted and fuel for the boats could be purchased on nesting beach research accounts, but the capability to work during the fall, winter and early spring was seriously diminished in spite of the fact that it was during the late fall, winter and early spring that capture rates for green turtles were the greatest. Then, in 1995, the National Marine Fisheries Service provided funding to support the field work on the lagoon and reef for one year. As a result, the research effort flourished and produced significant, even extraordinary, results.

Thanks in part to the provision of equipment and supplies by the NMFS contract, the field work continued at a moderate level of effort after May of 1996. That work produced some noteworthy, even surprising, results. These include significantly reduced capture rates (and therefore, reduced relative population densities) for green turtles in the Indian River Lagoon in the summer of 1997. Also, for the first time in eight summers of work and with nearly 200 green turtles examined, a significant prevalence of fibropapillomatosis appeared in the population of reef-dwelling juvenile green turtles, although the level of affliction was mild in every case. The proposal relevant to the current contract (P.O.) requested funding support for the continuation of the study of the population ecology of green turtles and loggerheads in the central region of the IRLS and over the near-shore reefs of the northern Indian River County, Florida, beginning in the late summer of 1997.

The period of time that is relevant to this report is September, 1997 through August, 1998. In our recent progress report we addressed results from the entire 1997 calendar year simply because the data gathered between September and December of 1997 (the first part of the contract year) were insufficient to make worthwhile comparisons and interpretations. This final report adheres more strictly to the period of the contract (purchase order). What follows, then, is a compilation and analysis of research results relative to the green turtle population of the near-shore reefs and to the green turtle and loggerhead populations of the central Indian River Lagoon, from September , 1997 through August, 1998. The report is organized with reference to the objectives stated in the proposal, as follows:

1. To continued to define long-term trends in relative population density of loggerheads and green turtles in the Indian River Lagoon system through seasonal live capture in tangle nets and analysis of CPUE.
2. To provide an index to long-term relative density of green turtles dwelling over near-

shore worm-rock reefs in northern Indian River County, Florida, through live capture in the summer and analysis of CPUE.

3. To continue to quantify the size and age structures of lagoon loggerhead and green turtle populations and of the reef-dwelling green turtle assemblage and to relate those data to the long-term trend.

4. To gain a further understanding of the sex ratios of lagoon loggerhead and green turtle populations and of the reef green turtle assemblage.

5. To further our understanding of the ecological geography of these loggerhead and green turtle assemblages.

6. To monitor the prevalence of fibropapillomatosis in two wild populations of green turtles on the east Florida coast.

7. To compare and contrast the biological attributes discussed above for lagoon and reef dwelling green turtles.

METHODS AND STUDY AREAS

Turtle populations were studied in two foraging habitats. One is in the Indian River Lagoon System (IRLS) which extends 260 kilometers along the east coast of Florida from Ponce DeLeon Inlet to Jupiter inlet (Figure 1). All of the netting effort in the IRL during this contract period has been expended in a large embayment 3 km south of Sebastian Inlet, unnamed on maps but known as South Bay by local commercial fishermen and residents, at a site within 1 km of the east shore (27° 49.' N, 80° 27' W). The central region of the IRL averages 1.5 meters in depth and exceeds 3 meters only in dredged channels and basins. The study area is on the relatively undeveloped eastern side of the lagoon. The undisturbed areas of shoreline are lined with red mangroves (Rhizophora wrightii). Sea grass beds composed primarily of manatee grass (Syringodium filiforme) and shoal grass (Halodule wrightii) are found in areas

Figure 1. The Indian River Lagoon System including the locations of the primary lagoon and reef netting sites.

less than one meter deep. The sea grass Halophila decepiens is also found in deeper waters next to the sea grass beds and in areas of drift algae. Large areas of drift algae, including Gracilaria sp., Acanthopteraspecifica, Bryothamnion seaforthii, Hypnea sp., and Solieria filiformis can be found in deeper waters adjacent to the grass beds.

The other study area is in the system of Sabellariid worm reefs that extend along the Atlantic Coast of Florida from Cape Canaveral southward to Biscayne Bay. The reefs are formed by a species of polychaete worms (Phragmatopoma lapidosa) in the Sabellariid family. These worms cement sand grains and fragments of shells into tubes; the aggregations of which form the reefs. These reefs extend from the intertidal zone to a depth of approximately 10 meters in a series of linear structures parallel to the shoreline. The reefs provide a substrate for the growth of at least 109 species of benthic marine algae; primarily red algae (Rhodophyta), but also green (Chlorophyta), brown (Phaeophyta), and blue-green (Cyanophyta) algae (Juett et al., 1976).

Turtles are captured through the use of large mesh tangle nets. The nets are approximately three meters deep with a 40 cm stretch (knot to knot) mesh size. They are hung from a braided polyethylene top line that is suspended at the surface by floats attached at intervals during deployment. The bottom line is braided polyethylene with a continuous lead core. In the lagoon 192 to 455 meters of net is set, depending on weather conditions. Over the Sabellariid worm reefs 220 meters of net is set.

In the lagoon the nets were deployed during daylight hours for varying lengths of time and were tended assiduously. The net was checked constantly by pulling hand over hand along the top line from the bow of a 15', 17' or 19' Boston Whaler boat. The nets were soaked for a total of 14.25 hours (6.55 km hours of effort) in the fall, 13.03 hours (6.00 km hours) in the winter, 25.95 hours (11.94 km hours) in the spring and

32.98 hours (12.03 km hours) in the summer. The seemingly limited number of km hours in fall and winter are reflective of the combination of high capture rates (many turtles, each requiring extensive processing), relatively short day length (the need to finish measuring, weighing, tagging, PIT-tagging, blood sampling, photographing, fibropapilloma mapping, etc.) and the desirability of releasing captured animals before sunset. On virtually every occasion the nets were retrieved earlier than anticipated so as not to overwhelm our capacity to process captured animals and to shift personnel to the tasks of handling, measuring, etc.

Ocean surface conditions only allow net deployment over the reefs during the summer months (as noted in our proposal), and even then there are many days when the surf conditions are too rough to work. Usually by early afternoon the rising sea breeze or thunderstorms force netting operations over the reefs to stop. When conditions do allow the net to be set, relays of swimmers equipped with mask, snorkel, and fins continuously patrol its length. Nets were deployed over the reefs for 8.53 hours (1.88 km hours) in the late spring and for 6.22 hours (1.37 km hours) in the early summer. Adverse ocean surface conditions and poor visibility prohibited work on the reef after 22 July.

In the lagoon, when a turtle becomes entangled it is immediately brought aboard and freed from the net. Measurements are made of its standard carapace length (SCL), total carapace length, straight-line carapace width, head width, and body depth by use of forestry calipers. Curved carapace length, curved carapace width, plastron length, the distance from the posterior tip of the plastron to the vent and from the posterior tip of the plastron to tip of tail are measured by use of a cloth tape. A spring scale is used to obtain weight. Each animal was double tagged externally. During the period of this study we applied an inconel tag to one front flipper and a plastic roto-tag in the other front flipper. Both kinds of tags were purchased from the Archie Carr

Center for Sea Turtle Research (UF, Gainesville). Each turtle was photographed and released near its capture location. Over the reef, captured turtles were disentangled at the surface and then transferred to a boat by means of a long-handled dip net. In most cases ocean surface conditions were too rough to allow for effective weighing, measuring, etc., so turtles captured over the reef were taken to land for processing.

Determining the abundance of marine turtles by a direct visual census is at best difficult, and in many of their habitats impossible. The latter is the case with both the Indian River Lagoon System (IRLS) and Sabellariid worm reef marine turtle populations. Instead, catch per unit effort (CPUE) data can be used as an index of relative abundance (Ricker, 1958). The unit of effort for this study was standardized as the net kilometer-hour, i.e. one kilometer of net in the water (net soak) for one hour. CPUE was calculated using the formula $C/(L \times T)$ where C = the number of captures, L = the length of net used, and T = the amount of net soak time.

Previously, the IRLS loggerhead and green turtle CPUE data were analyzed to determine if there was an increase or decrease in relative abundance of either species over the 14 year period through 1996, and if cyclic fluctuations in their relative abundance occurred from season to season. To test the null hypothesis that there were no significant changes in the relative abundance of either species recently, the 1997-98 CPUE data were compared statistically to those from the early years (1983-85), mid years (1988-90) and later years (1993-95). Because netting operations have been consistently conducted during the months of June and July each year from 1983 through 1995, while netting during other months was not conducted as consistently over the years due to time and budget constraints, only the data from June and July were used in these comparisons. This also minimized the possible influence of environmental variables such as water temperature, hours of daylight and food availability.

To quantify within-year cyclic fluctuations, CPUE data obtained for each species during the Winter (December 22 to March 21), Spring (March 22 to June 21), Summer (June 22 to September 21), and Fall (September 22 to December 21) were compiled and statistically compared to test the null hypothesis that there are no significant differences in relative abundance from one season to another.

Because netting over the Sabellariid reefs is generally only feasible during late May, June and July, it was not possible to look for within year cyclic fluctuations. The Sabellariid worm reef CPUE data obtained during this contract year were compared statistically with those from seven previous years to test the null hypothesis that there were no significant changes in the relative abundance of green turtles over the span of the study.

Due to the non-normal distribution of CPUE data, the Kruskal-Wallis nonparametric ANOVA test was used. When there were significant differences between samples, Dunn's multiple comparison test was used to determine which of the samples were significantly different from others in the data set. All statistical tests were performed using InStat for the Macintosh, published by GraphPad Software, Inc.

Blood samples were taken within the first few minutes after capture. Blood was drawn from the cervical sinus into a sterile 10 ml vacutainer (with lithium heparin additive)using a 20 or 22 gauge needle. The whole blood was then kept on ice until it could be centrifuged. Upon return to the lab, samples were centrifuged for approximately 15 minutes using an Adams Physicians Compact Centrifuge. Plasma was drawn by pipette to make 2 equal samples; one for testosterone analysis, and one to be used in the ongoing fibropapilloma research at the University of Florida. These samples were kept frozen until they were ready to be shipped in dry ice.

RESULTS AND DISCUSSION

Relative Population Size

Indian River Lagoon System

From September, 1997 through August, 1998 tangle nets were set in the Indian River Lagoon System 24 times for a total of 86.21 hours. During those netting sessions 35 loggerheads and 164 green turtles were captured.

Loggerheads

Overall, the loggerhead CPUE for the contract year was was 1.05 (Table 1). The loggerhead CPUE was analyzed for seasonal differences and for departure from the long term trend (1983-1995) in population density.

Seasonally, the average CPUE varied from a low of 0.43 in the Fall of 1997 to a high of 1.32 in the Spring of 1998 (Figure 2), but was not statistically significant (K-W statistic = 1.672, P = 0.643). Table 2 contains the seasonal loggerhead CPUE data.

As can be expected with a single year of data, the seasonal CPUE averages differed somewhat from the long term seasonal averages reported by Ehrhart et al. in 1996 (Figure 2). The Fall and Winter averages were lower than the long term while the Spring and Summer averages were higher; but again, a statistical comparison indicated there were no significant differences (K-W statistic = 6.445, P = 0.489).

To be consistent with method utilized by Ehrhart et al. (1996) to examine the long term population trend, the loggerhead CPUE data from the months of June and July were combined for the years 1983-85, 1988-90, and 1993-95. These time spans and the combined June and July data for the contract year were statistically analyzed to look for any trend in population density (Figure 3). The results of that analysis (K-W = 1.685, P= 0.64), and an examination of Figure 3 indicates that the loggerhead population density in the central region of the IRLS has not changed over the 15 year span of the study.

Green Turtles

The overall green turtle CPUE for the contract year was 4.42 (Table 1). As with the loggerheads, the green turtle CPUE data was analyzed for seasonal variation and for departure from the long-term population density trend.

Over the span of the contract period the seasonal CPUE (Table 2) varied from an average of 3.61 in the Summer to 7.80 in the Winter (Figure 4). Though there is a noticeable seasonable difference in green turtle population density, it is not statistically so (K-W statistic = 5.24, P = 0.155). Of interest is the shift in greatest population density from Spring, as reported by Ehrhart, et al. in 1996 to the Winter months in 1997-98. Whether there is an underlying biological reason for this or if it is just one of those flukes occasionally encountered in field work would, at this point, only be a matter of speculation.

Something else of interest about the data presented in Figure 4 is that, with the exception of Spring, the 1997-98 seasonal capture rates are higher than the averages for 1983-96. This supports the speculation by Ehrhart et al. (1996) that the surge in green turtle CPUE that occurred in the Winter and Spring of 1995-96 may have been an indication of another stops increase in population density (refer to Figure 5). A statistical analysis of the data sets of the June and July CPUE for the combined years 1983-85, 1988-90, 1993-95, and 1998 lends further credence to that speculation (K-W = 35.24, $P < 0.0001$). Dunn's multiple comparison test revealed that the 1998 CPUE was significantly greater than the 1983-85 CPUE ($P < 0.001$), the 1988-90 CPUE ($P < 0.05$) and 1993-95 CPUE ($P < 0.05$).

Sabellariid Worm Reefs

During the 1998 reef netting season, 1 June through 22 July, nets were deployed 13 times for a total of 14.75 hours. Fifty juvenile green turtles were captured

during the season, yielding an overall CPUE of 7.02 (Table 3). No other marine turtle species were captured.

The average green turtle CPUEs from 1989 through 1995 and 1997 are shown in Figure 6. Although there is a statistical difference in the CPUE between years (K-W = 35.24, $P < 0.001$), the fluctuations do not follow any discernible pattern. They may be the result of changes in surf conditions and water clarity from year to year, which affect netting success, rather than radical changes in green turtle population density over the reefs. It might also be the result of yearly fluctuations in the availability of the marine macroalgae species utilized by the green turtles as food.

The reef field season started in late Spring (1 June) and extended through the first part of the Summer (22 July). A statistical comparison of the CPUEs for netting sessions in each of the two seasons revealed no significant difference (Mann-Whitney U = 13.5, P = 2.95).

Species Composition

Lagoon

From 1 September 1997 through 31 August 1998, 199 marine turtles were captured in the central region of the IRLS (Figure 7). Of those, 165 were juvenile green turtles (147 initial captures, and 18 recaptures). Loggerheads accounted for 33 captures, of which 30 were subadults (27 initial captures and 3 recaptures) and 3 were adults. Despite the difficulties of distinguishing small mature loggerheads from large immatures, all three of these animals were captured during the nesting season, had SCL measurements greater than 87.0 cm, had short tails and were therefore believed to be adult females. One Kemp's ridley turtle (Lepidochelys kempi) was also caught in the lagoon (Table 4), ten years after the last previous capture of that species in 1988.

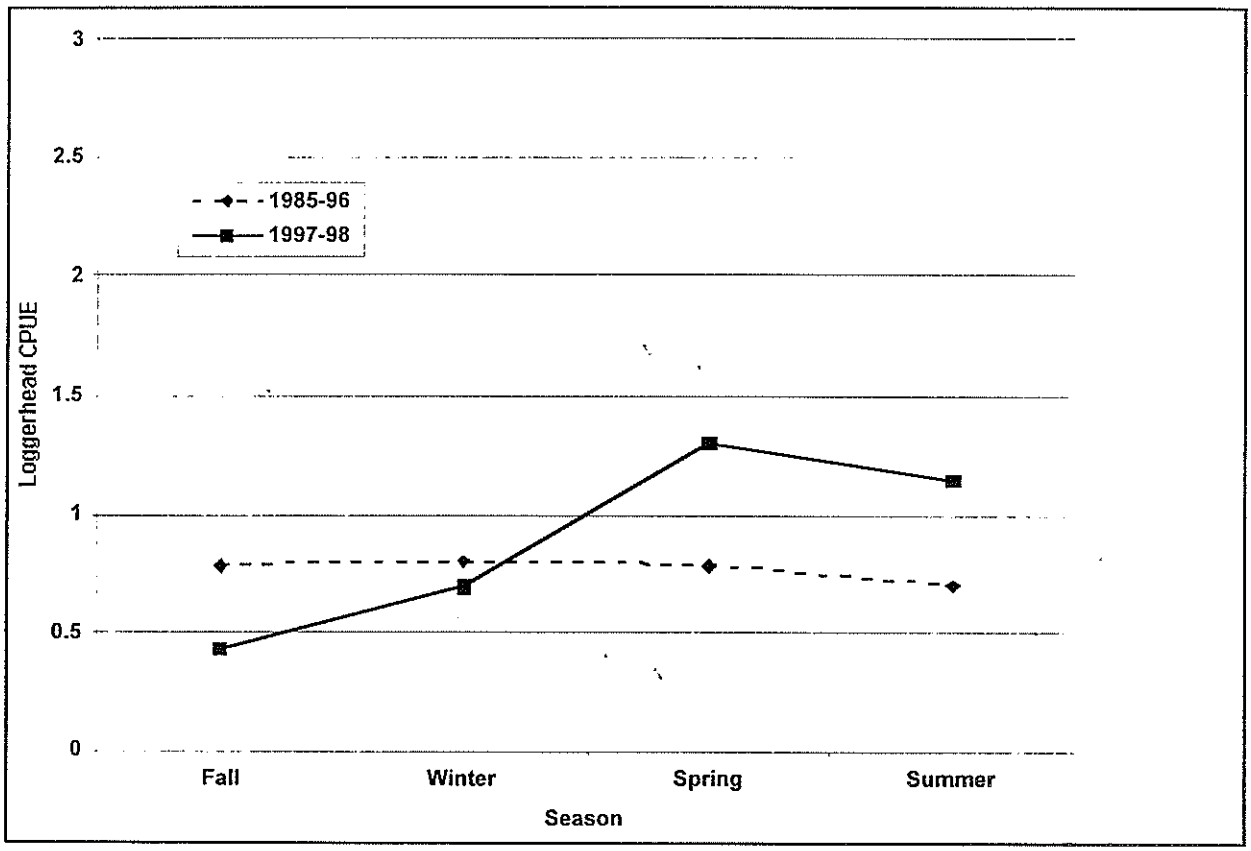

Figure 2. Seasonal variation in loggerhead CPUE, 1985-96 vs. 1997-98.

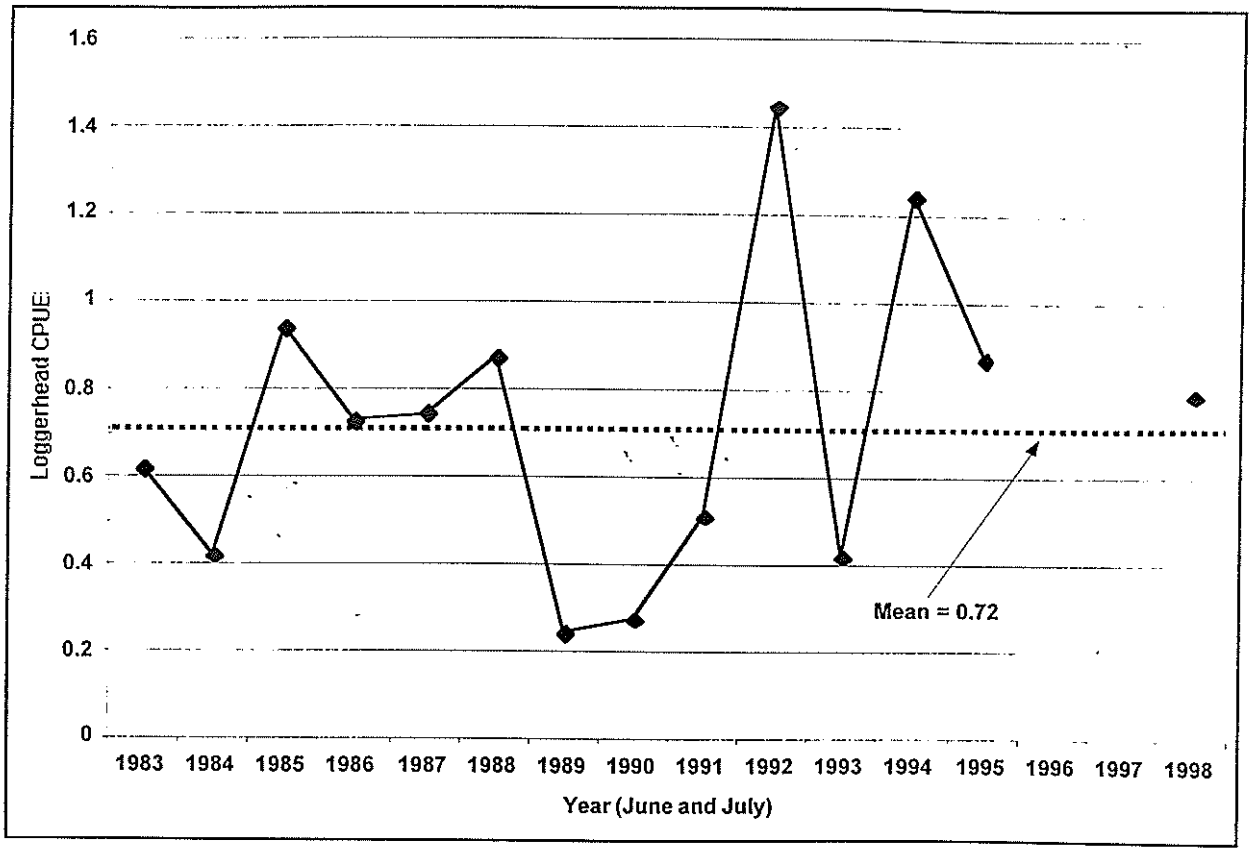

Figure 3. Long term trend in loggerhead population density.

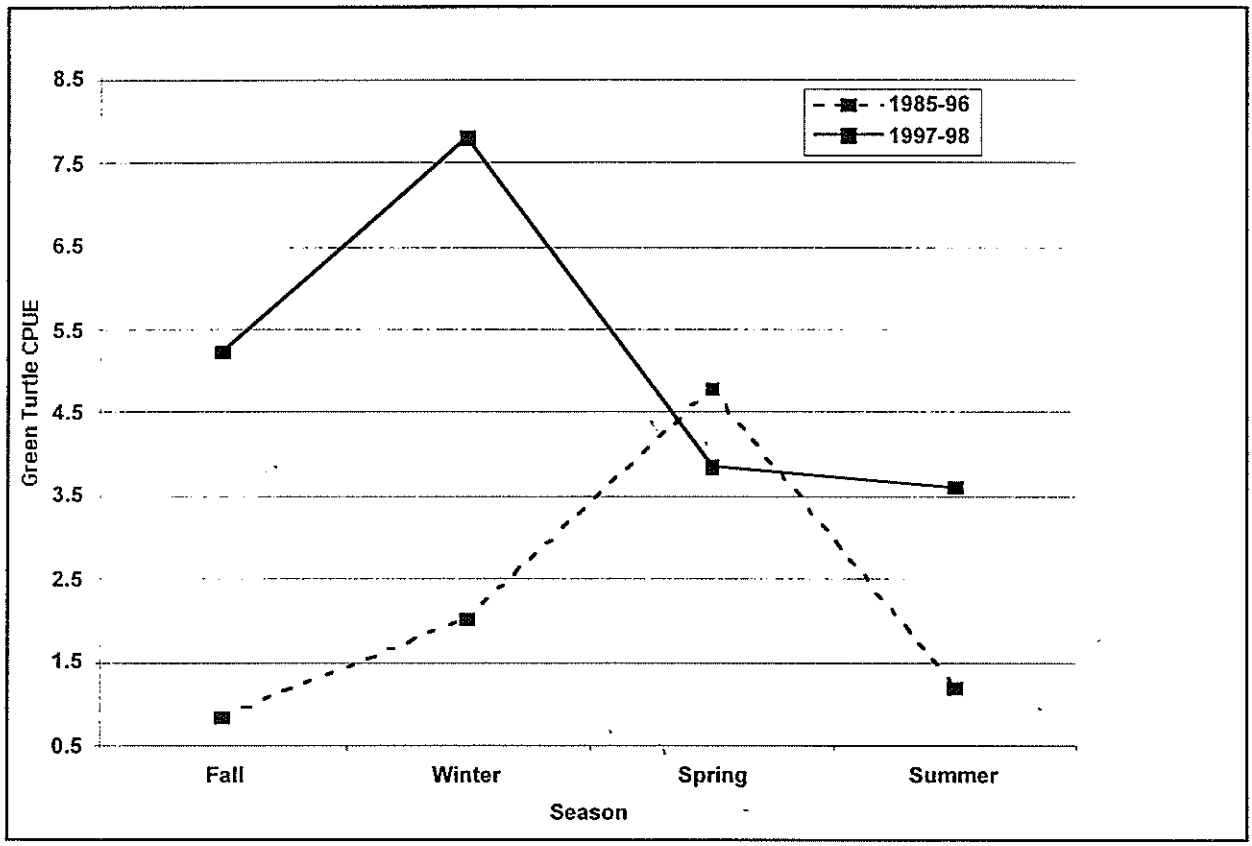

Figure 4. Seasonal variation in green turtle CPUE, 1985-96 vs. 1997-98.

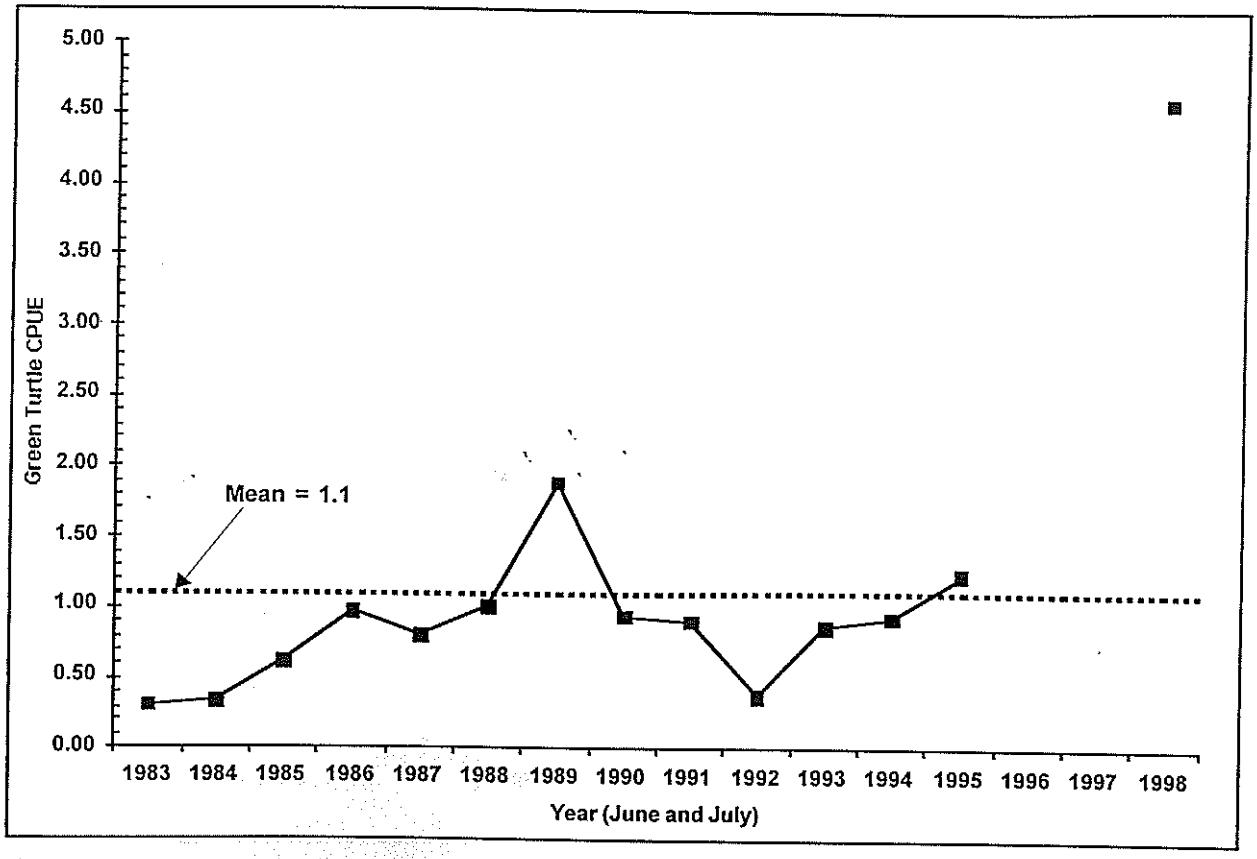

Figure 5. Long term trend in green turtle population density.

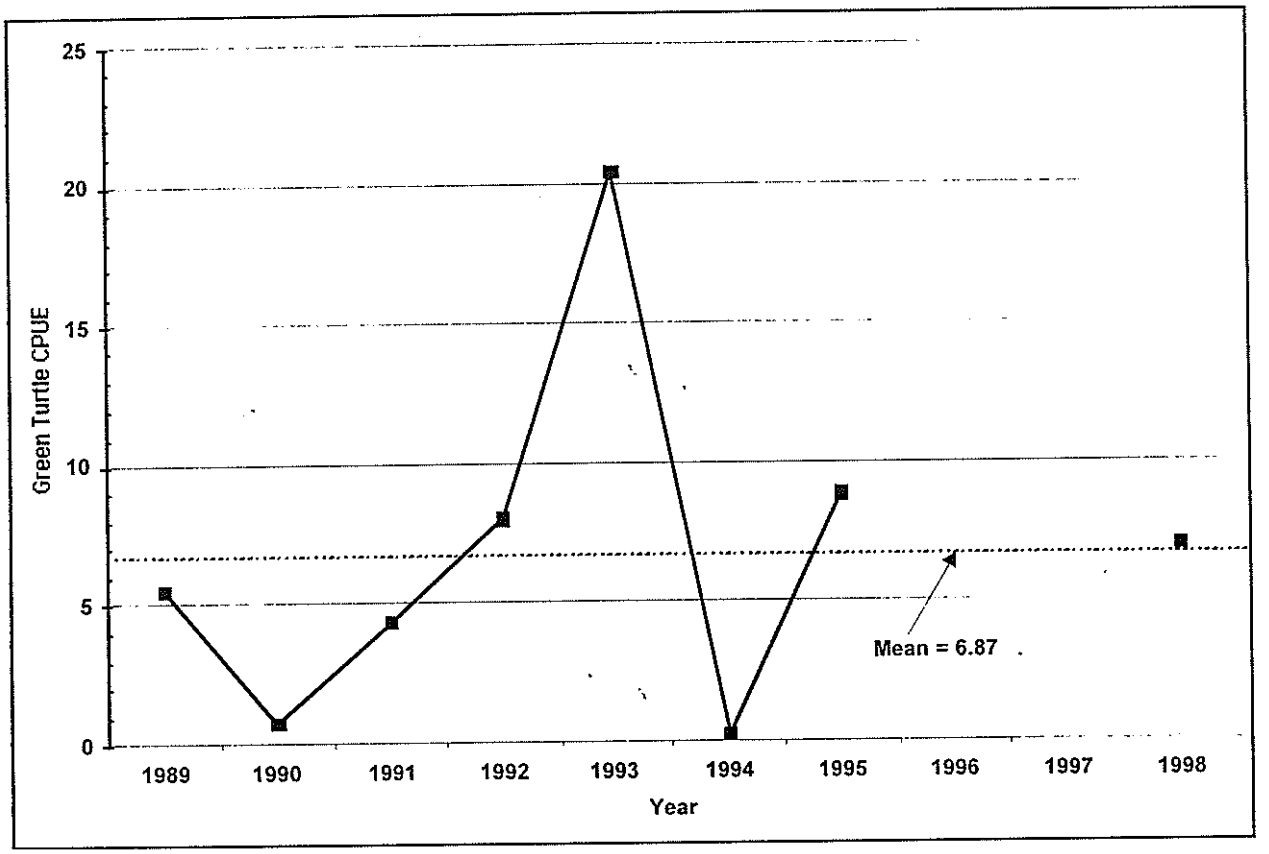

Figure 6. Long term trend in the Sabellariid Worm Reef green turtle population density.

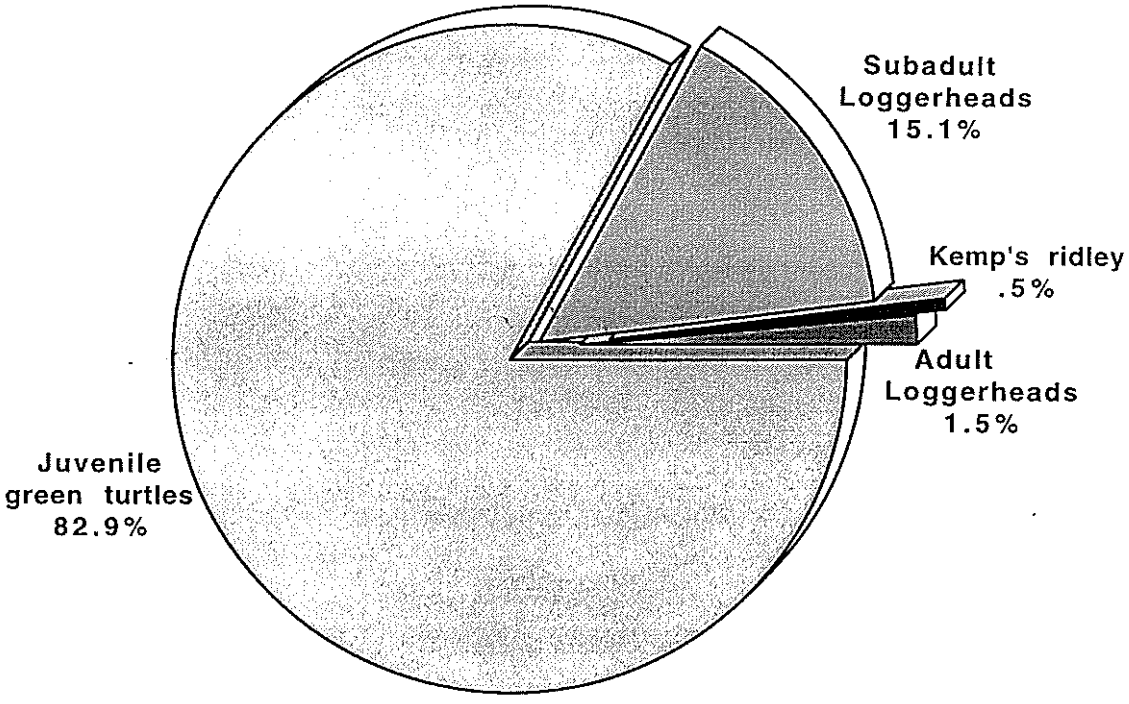

Figure 7. Composition of net-captured marine turtles from the Indian River Lagoon System, Indian River County, Florida, from September, 1997 through August, 1998.

The higher proportion of green turtle captures is consistent with findings reported in our Comprehensive Final Report to NMFS in 1996. We continue to capture juvenile green turtles in higher numbers than in previous years. In 1996, we suggested that the high proportion of green turtle captures in the central region of the Indian River Lagoon may be due to the large area of drift algae present at the netting site. There has been no new evidence to suggest otherwise. Regardless, the captures during this time frame continue to demonstrate that this area of the lagoon system is prime developmental habitat for both green turtles and loggerheads.

Reef

Also during the period of 1 September 1997 to 31 August 1998, 50 juvenile green turtles (49 initial captures, and 1 recapture) were captured over the Sabellariid worm reefs. No loggerheads were caught during the same netting periods. This is not unusual in that there have been only six loggerhead captures (five subadults and one adult) since this work began in 1989. The lack of loggerhead captures over the reef remains somewhat perplexing in light of the large number of loggerheads captured in similar reef habitat off Hutchinson Island, St. Lucie County, Florida less than 60 km to the south (Ernest et al., 1989; Bresette, 1999, pers com).

Population Structure

Lagoon Green Turtles

The SCL measurements for all initial capture green turtles ranged from 29.9 cm to 68.0 cm with a mean of 43.6 cm for the initially captured animals which is slightly different than previously observed. The range for 16 years of compiled data reported in 1996 was 24.3 cm to 72.4 cm with a mean of 40.7 cm. Figure 8 shows the distribution of SCL measurements of initial green turtle captures during the period of

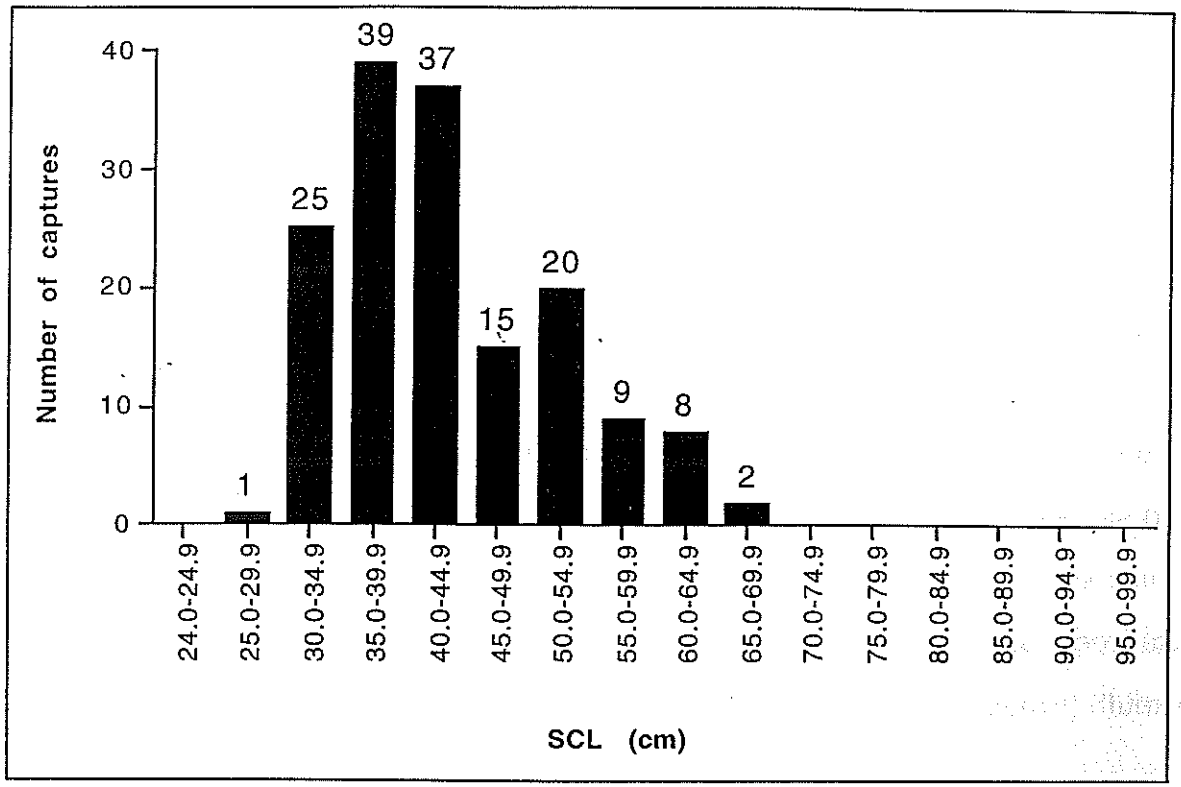

Figure 8. Distribution of the standard carapace length measurements of initial capture green turtles from the central region of the Indian River Lagoon System, Florida, from September, 1997 through August, 1998.

September, 1997 through August, 1998, and Figure 9 relates the SCL measurements of captures during this time period to the overall 1982-1996 summary given in the Comprehensive Final Report. Although the range has been narrowed, it appears that the remaining size classes are represented in approximately the same proportions as reported in 1996. Table 5 contains the eight standard measurements and weight of each initial capture juvenile green turtle. A summary including the median, mean, standard deviation and range of each measurement is at the end of the table.

The structure of the juvenile green turtle population in the central region of the Indian River Lagoon system is similar in both the mean and range of SCL measurements to that reported for some of the other developmental habitats along the Atlantic and Gulf coasts of the U.S., yet dissimilar in mean and/or range to others. There doesn't seem to be a discernible geographical pattern. An extensive compilation and comparison of these developmental habitats was provided in the Comprehensive Final Report and is not repeated here.

Lagoon Loggerheads

The range of SCL measurements for all central region IRLS initial capture loggerheads was 49.2 to 89.1 cm with a mean of 64.8 cm (Figure 10). The mean SCL of the subadult loggerhead lagoon population was 62.4 cm, and ranged from 49.2 to 77.6 cm, as compared to a mean of 62.6 cm and a range of 41.5 cm to 82.5 cm for the long term data. The distribution of SCL measurements from September, 1997 through August, 1998 is given as a comparison to that from the 1996 report in Figure 11.

Table 6 contains the eight standard measurements and weight of each initial capture subadult loggerhead. A summary including the median, mean, standard deviation and range of each measurement is at the end of that table. Once again, a detailed compilation and comparison of this population of subadult loggerheads to

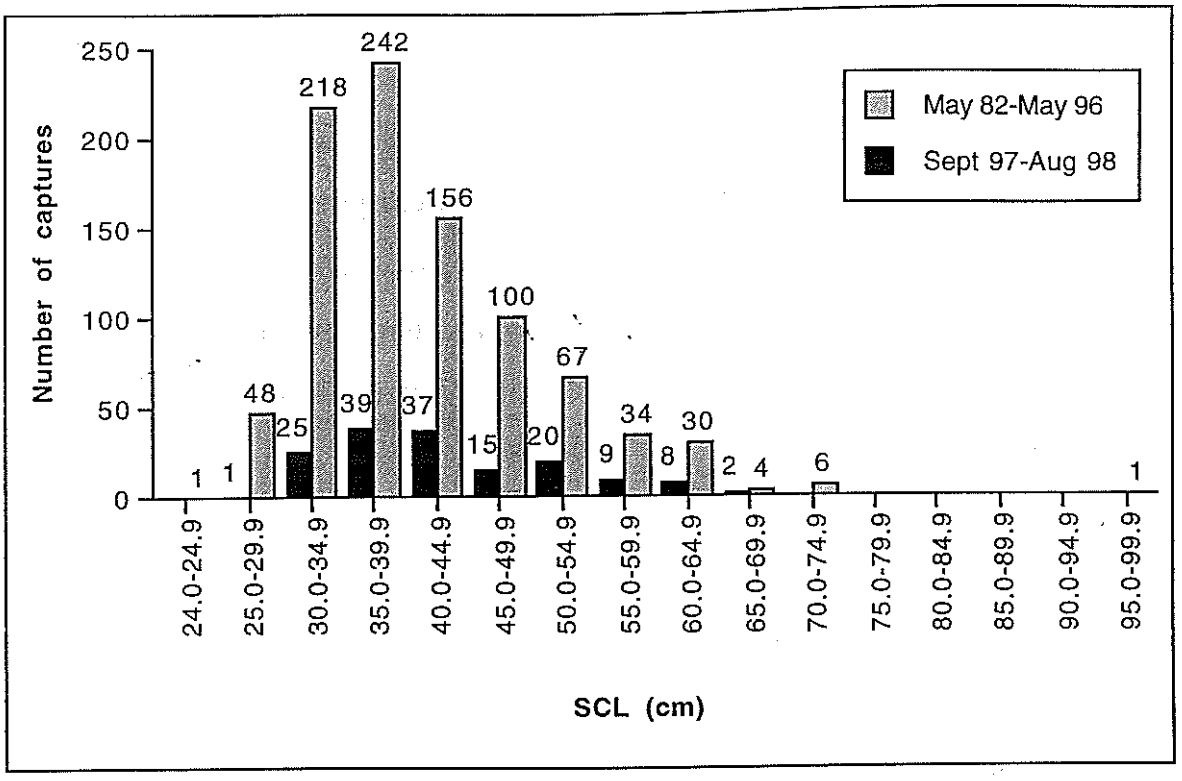

Figure 9. Distribution of the standard carapace length measurements of initial capture green turtles from the central region of the Indian River Lagoon System, Florida.

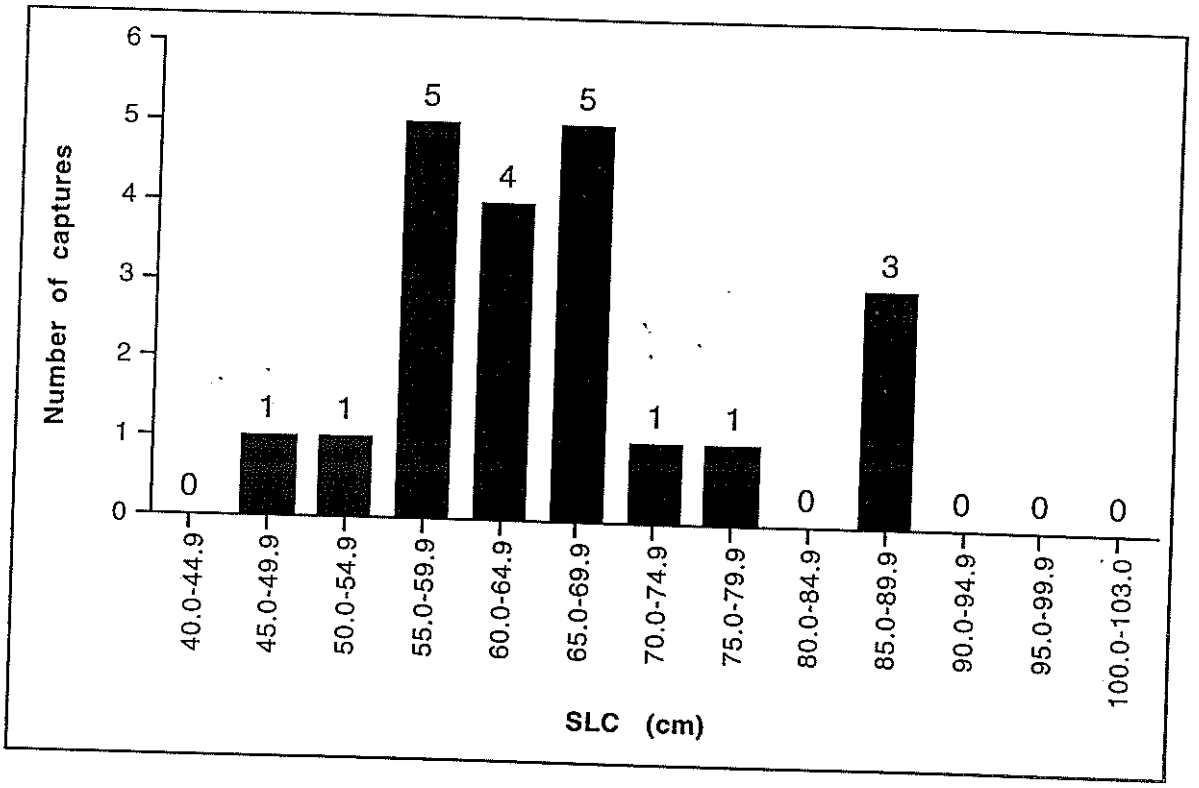

Figure 10. Distribution of the standard carapace length measurements of initial capture loggerheads from the central region of the Indian River Lagoon System, Florida from September, 1997 through August, 1998.

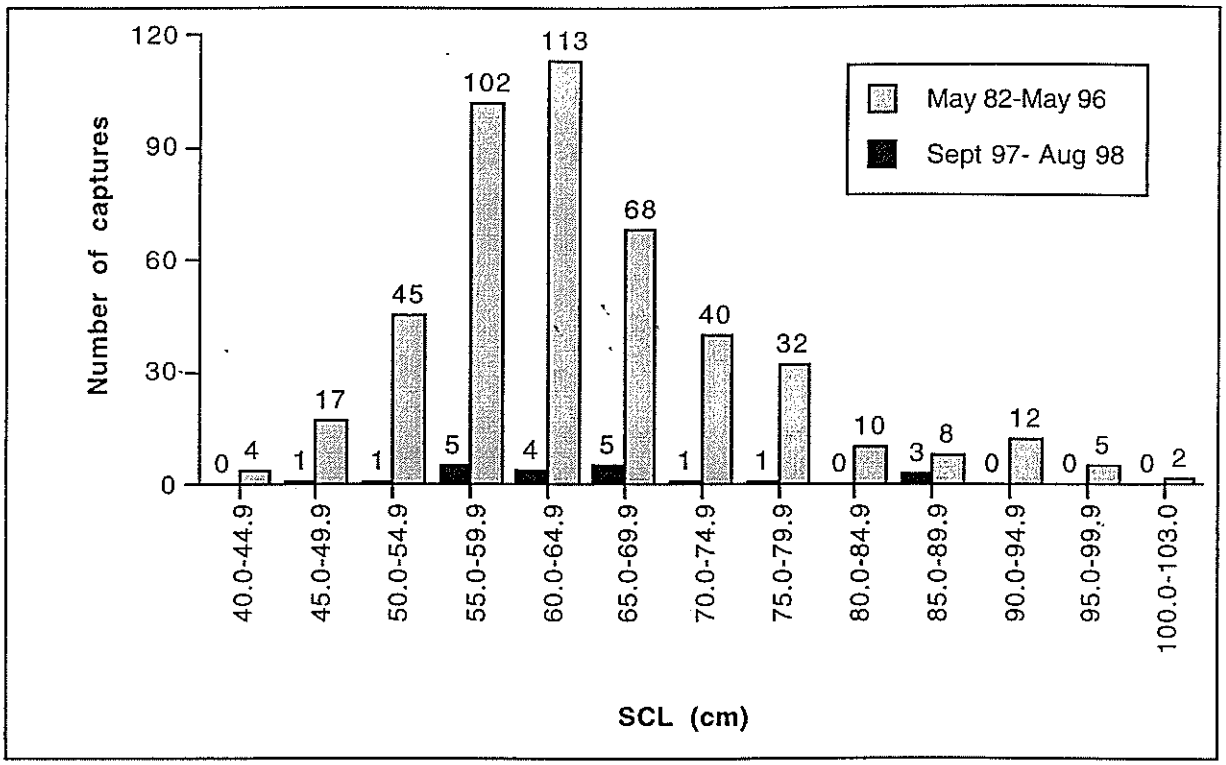

Figure 11. Distribution of the standard carapace length measurements of initial capture loggerheads from the central region of the Indian River Lagoon, Florida.

other populations studied was reported in the 1996 Comprehensive Final Report and is not repeated here. Table 7 has the standard measurements, and weights of the three adult female loggerheads captured incidentally during this time. Because of the difficulty in landing adult loggerheads in the small boats used to tend the nets and in handling them once they were aboard, weights and some measurements were not obtained for these animals.

Reef

The range of SCL measurements of initial capture juvenile green turtles captured over the Sabellariid worm reefs during this time period was 28.2 cm to 64.2 cm with a mean of 43.9 cm (Figure 12). This distribution is shown in comparison to the overall 1982-1996 distribution in Figure 13 when we reported a range of 25.1 cm to 67.0 cm and a mean of 41.1 cm. Table 8 contains the eight standard measurements and weight of each green turtle captured, excluding recaptures within the one-year period. A summary including the median, mean, standard deviation and range of each measurement is at the end of that table. The structure of the reef population is essentially the same as that of the lagoon juvenile green turtle population.

As noted above, the capture of so few loggerheads over the Sabellariid worm reefs is hard to understand, especially since they are commonly caught at Hutchinson Island over the reefs further south along Florida's east coast. From September, 1997 to August, 1998, no loggerheads were captured over the Sabellariid worm rock reef system in northern Indian River County.

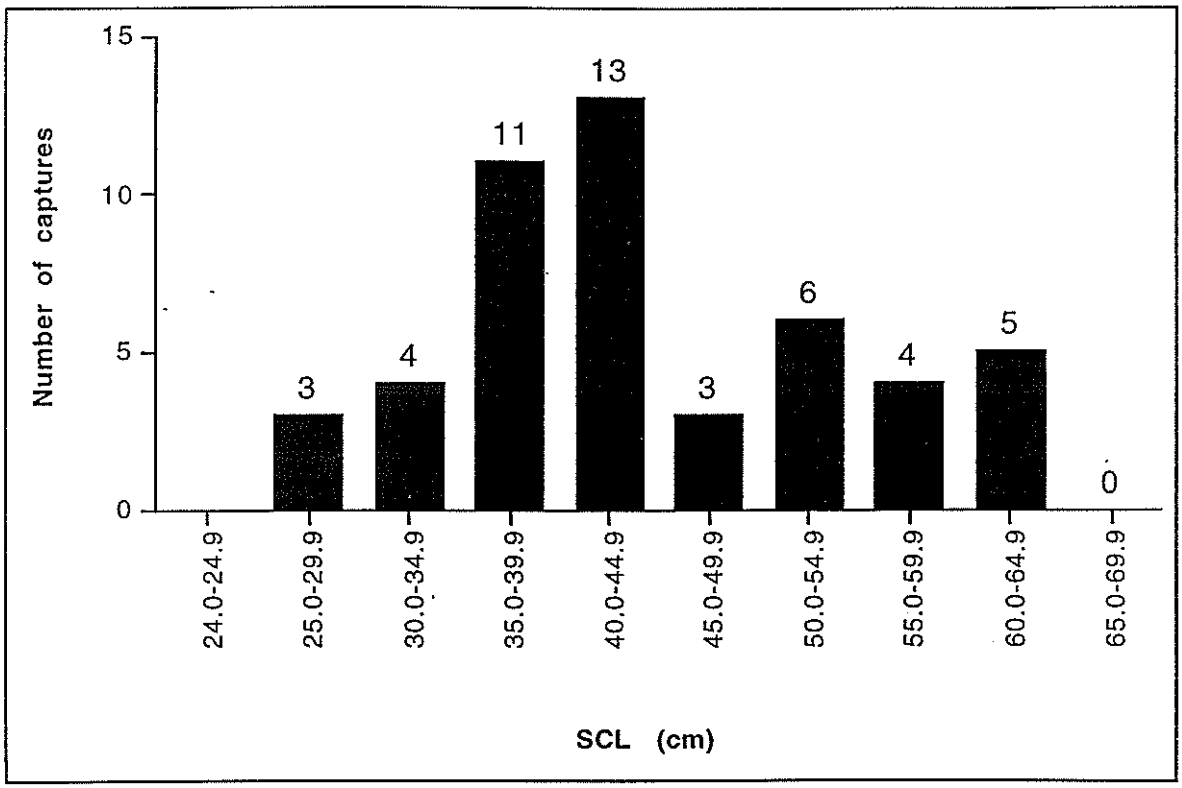

Figure 12. Distribution of the standard carapace length measurements of initial capture green tutles from the Sabellariid worm reefs, Indian River County, Florida from September, 1997 through August, 1998.

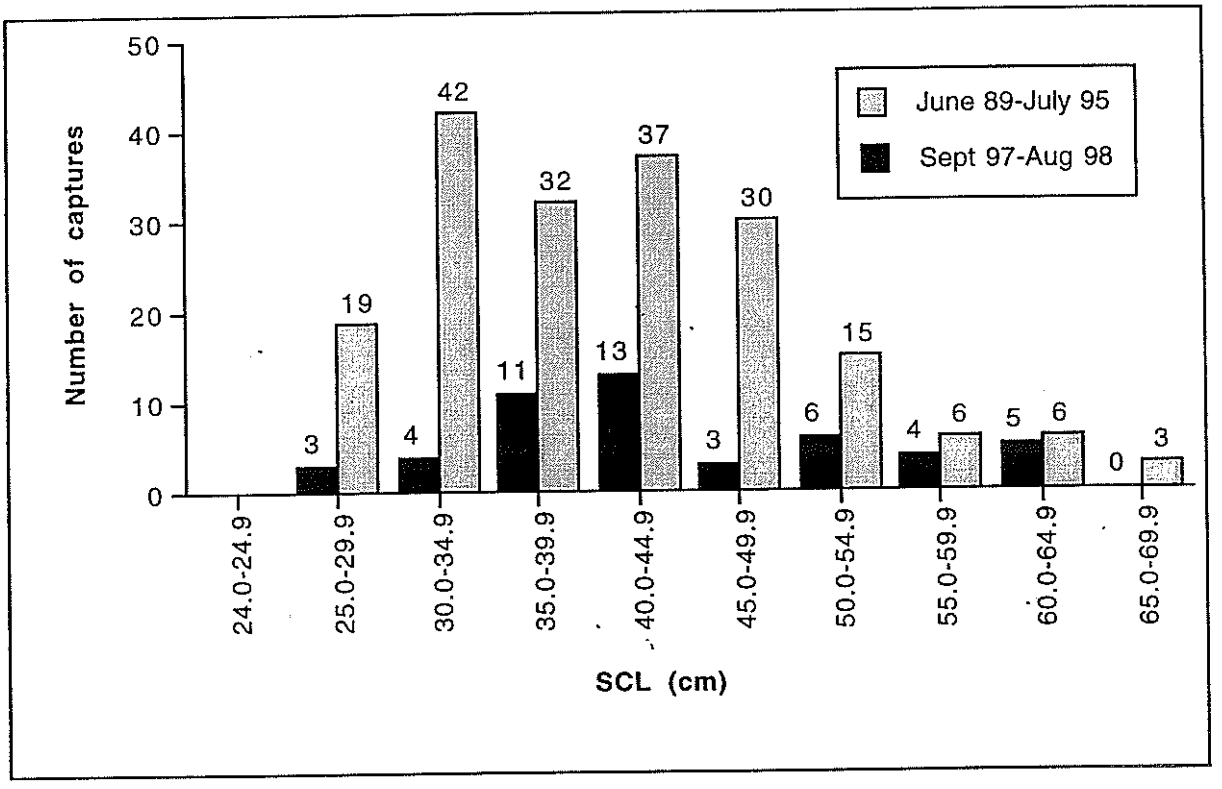

Figure 13. Distribution of standard carapace length measurements of initial capture green turtles from the Sabellariid worm reefs, Indian River County, Florida.

Sex Ratios

Results of radioimmunoassay (RIA) analysis of testosterone titer levels of lagoon and reef turtles are given in Tables 9 and 10. The RIA results for lagoon greens and loggerheads given in the 1996 report suggested a female-bias in both species. Those data were based on samples collected during the first nine months of 1995 from 37 greens and 11 loggerheads. The results in Table 9 represent the remaining samples analyzed from turtles captured from September through December in 1995 and received during the time frame of this report. It therefore makes sense to present them both as the remainder of 1995 and with the earlier results to reflect the complete data set for 1995. Results for both species displayed both ways are shown at the bottom of Table 9. While the population of green turtles continued to display a female-biased sex ratio regardless of how one presents the data, the loggerhead sex ratio for the last three months in 1995 resulted in a male-biased population (2.0:1.0). When loggerhead RIA results were combined for the entire year, however, the final result was again female-biased at a ratio of 1.6:1.0 (female:male). The overall sex ratio based on RIA for the lagoon green turtle population in 1995 was 2.9:1.0 (female:male).

In the 1996 report, we presented the 1995 RIA results based on 35 samples from reef-dwelling juvenile green turtles as a 1.3:1.0 (female:male) sex ratio. In Table 10 we provide data from the 13 samples taken in 1996, where the RIA revealed an astounding 4.5:1.0 (female:male) ratio. This is the largest bias in our results to date, and comes at a time when much additional care was taken to ensure that samples were being collected within ten to fifteen minutes of capture. It is possible that the difference is simply related to the small sample size in 1996, which may not reflect the true sex ratio of the population. The results are still, however, female-biased as in the past.

Ecological Geography

Remote Recoveries

Remote tag returns are rare and although we have received quite a few, no long distance tag recoveries of lagoon or reef green turtles or loggerheads were received during the time period covered by this report.

Domestic Recoveries

We explained in the 1996 report that domestic recoveries of our tagged turtles have usually been within approximately a three county area (with only one exception) and that most recoveries have been in the local area, near the U.C.F. netting sites. This is what we find during this time period as well.

Loggerheads

There was only one recovery of a lagoon loggerhead during the period of September, 1997 through August, 1998 (Table 11). This turtle was originally tagged by Erik Martin at the St. Lucie Power Plant at Hutchinson Island in February, 1994. The turtle was found injured and taken to Sea World of Florida (no date) where it was rehabilitated and released in September, 1994 at Hutchinson Island. The U.C.F. group captured it in South Bay in June, 1995. Results of radioimmunoanalysis had revealed this individual to be female. She was found floating in the Indian River Lagoon near Sebastian Inlet in April, 1998, killed by a boat propeller.

Green turtles

Table 12 shows that there have been four lagoon recoveries of green turtles during this time period; three turtles and one instance of a tag only, found floating at Wabasso Beach, approximately ten miles south of our lagoon netting site on the ocean side. The other three recoveries were of juvenile green turtles, all in the Indian River Lagoon. One of these turtles was killed by boat prop, the other was found dead on a spoil island in the lagoon with no cause of death given. The third was found in Indian

River County with monofilament line wrapped around one of its rear flippers. The longest time between capture and recovery was one year and nine months for the turtles; two years, five months for the "tag only" recovery.

During this time there were also three reef recoveries (Table 13), but two of these were tags only, found washed up on the beach in the immediate vicinity of our reef netting site. The third, however, was a juvenile green turtle that washed up on Vero Beach exactly two weeks after we encountered it on the reef. This turtle is awaiting necropsy to determine cause of death.

Strange Recaptures

Occasionally during the course of our routine research work we happen to capture a turtle that has already been tagged by another researcher. While these opportunities occur infrequently, many of our "strange recaptures" are turtles tagged and released by the St. Lucie Power Plant on Hutchinson Island. From September, 1997 to August, 1998 the U.C.F. group recaptured six turtles (five loggerheads and one green) that had been tagged by others; two by our colleagues at the Power Plant. One of these was a juvenile green turtle tagged just under three years prior to our capture. In addition, this year we captured three turtles released into the lagoon by Sea World of Florida; two of them on the same day they were released. The final capture by the U.C.F. group was the most interesting. It was a subadult loggerhead that had been tagged in the Azores nearly two years before it was recovered in the Indian River Lagoon. Table 14 lists the tagging and morphometric data associated with turtles tagged by others and recaptured by U.C.F.

Fibropapillomatosis

Indian River Lagoon

The presence or absence of fibropapillomatous tumors on individual green turtles from the IRL is indicated in Table 5. The data in the statistical summary at the end of that table show that fully 70% of the green turtles encountered in the lagoon during the period of this contract were afflicted by the disease (referred to hence as "GTFP"). The data represented in Figure 14 are similar (providing a prevalence of 71%) but compiled for the entire calendar year of 1998, so as to allow for comparisons with other full years in our data set. Examination of Figure 14 reveals a rising trend in disease prevalence over the past three years with rates of 61% in 1996, 69% in 1997 and 71% in 1998. Only in one of the previous 14 years (1990) had GTFP prevalence topped 60% and that was a year in which the sample size was especially small. The data from this period suggest that the extraordinary rise in GTFP prevalence seen in 1996 (the year in which NMFS support provided the means to achieve the largest sample ever; Figure 14) was apparently not an aberration. The prevalences seen since that year, in 1997 and 1998, suggest that the increase is real and that an even greater proportion of the Indian River green turtle population is afflicted by this debilitating disease.

Sabellariid Worm Reefs

The presence or absence of fibropapillomatous tumors on individual green turtles from the reef habitat is indicated in Table 8. The data in the statistical summary at the end of that table show that 8% of the green turtles encountered over the reef during the period of this contract were afflicted by the disease. The data are graphed for the 1998 calendar year in Figure 15 and correspond identically to those in Table 8 because all of the work on the reef was done in the summer of 1998. It should

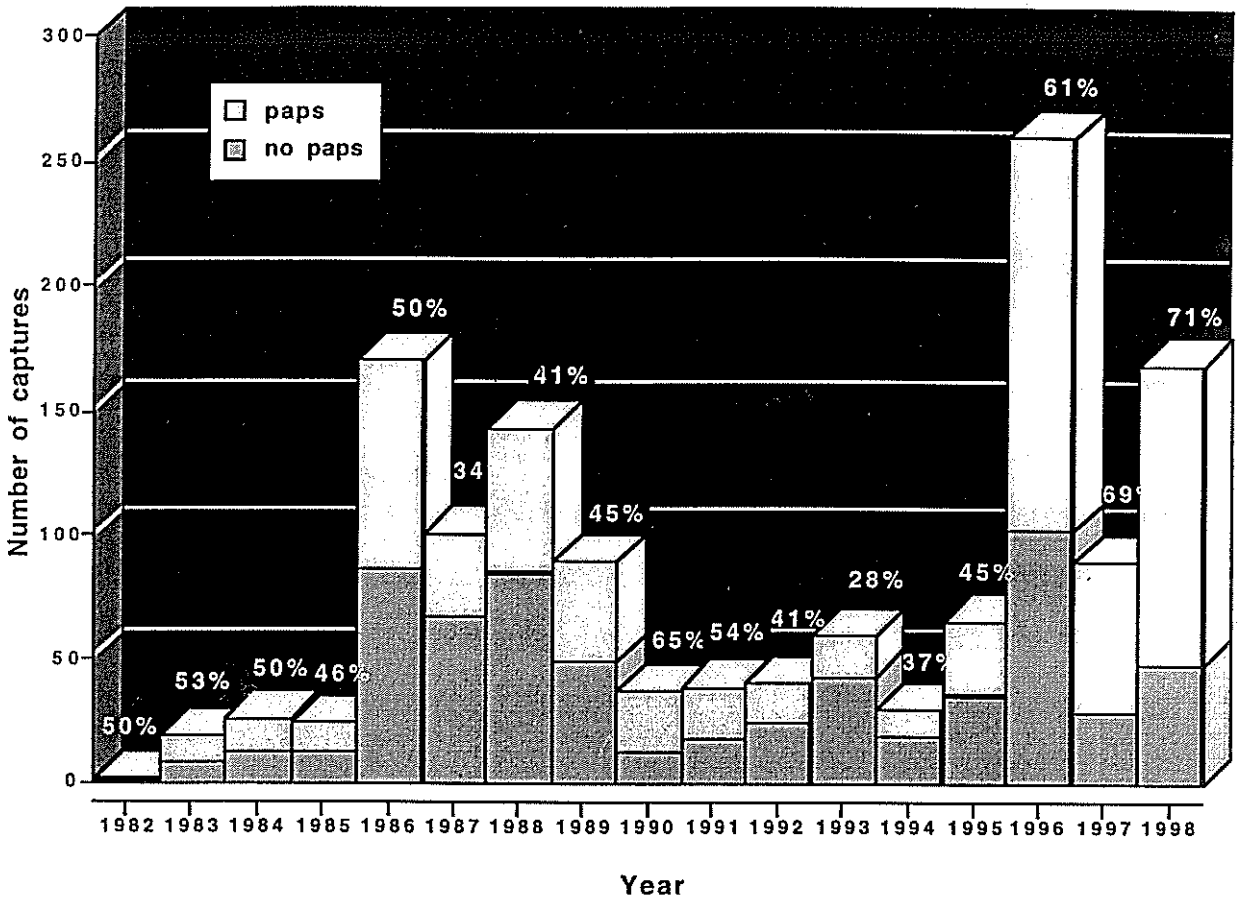

Figure 14. Prevalence of fibropapillomatosis in juvenile green turtles in the Indian River Lagoon system of east Florida, shown as a percentage of the total captures by year.

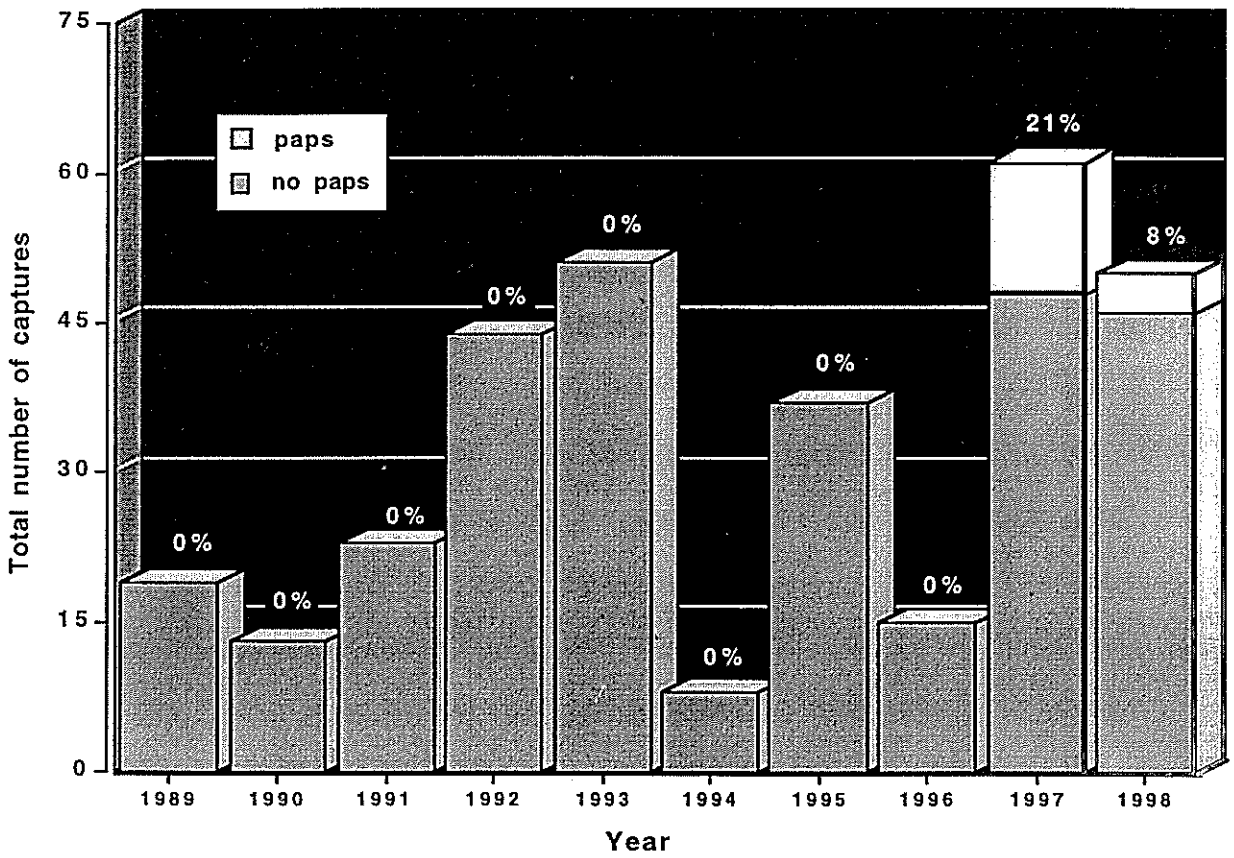

Figure 15. Prevalence of GTFP in net-captured juvenile green turtles from nearshore Sabellariid worm rock reefs.

be recalled that in the eight years of study of the reef green turtle population prior to 1997 no evidence of the disease was seen. In the summer of 1997, however, 13 of 61 greens (21%) were afflicted. It was true in 1998, as in 1997, that, in all cases, the tumors were small and not very numerous. None were judged to be in the "moderate" or "severe" part of the range of severity values used to ordinate the conditions of individual turtles. Additional comments on this topic will be made below, but for now it can be said that the 1998 data corroborate the fact that we can no longer say, as we could for so many years, that the disease is not seen in the reef population.

Loggerheads

Fibropapillomatosis has been observed in IRL loggerheads since 1984 but in very low prevalence and not at all in some years (Figure 16). The data collected during the period of this contract, given for individual loggerheads in Table 6, provide no exception to that statement, although, at 10%, the prevalence is slightly higher than ever before. For the 1998 year as a whole the prevalence in loggerheads was slightly less than that (Figure 6) and there has still been no evidence of anything but very mild affliction (usually one or two small growths). Considering that "full blown" cases of fibropapillomatosis have been showing up in other parts of Florida in recent years and that the disease is now known from all of the hard-shell species (the flatback, Natator, may be the exception), it will be worthwhile to monitor the status of the disease in loggerheads of the east Florida seaboard over the short- and long-term future.

Similarities, Differences, and Connections

The question as to the autonomous status of the lagoon and reef green turtle populations is a fair one. Indeed, it may be improper to regard them as "populations," at all. Their habitats exist within less than one kilometer of one another, at essentially the same latitude along the east Florida coast, separated only by a narrow barrier

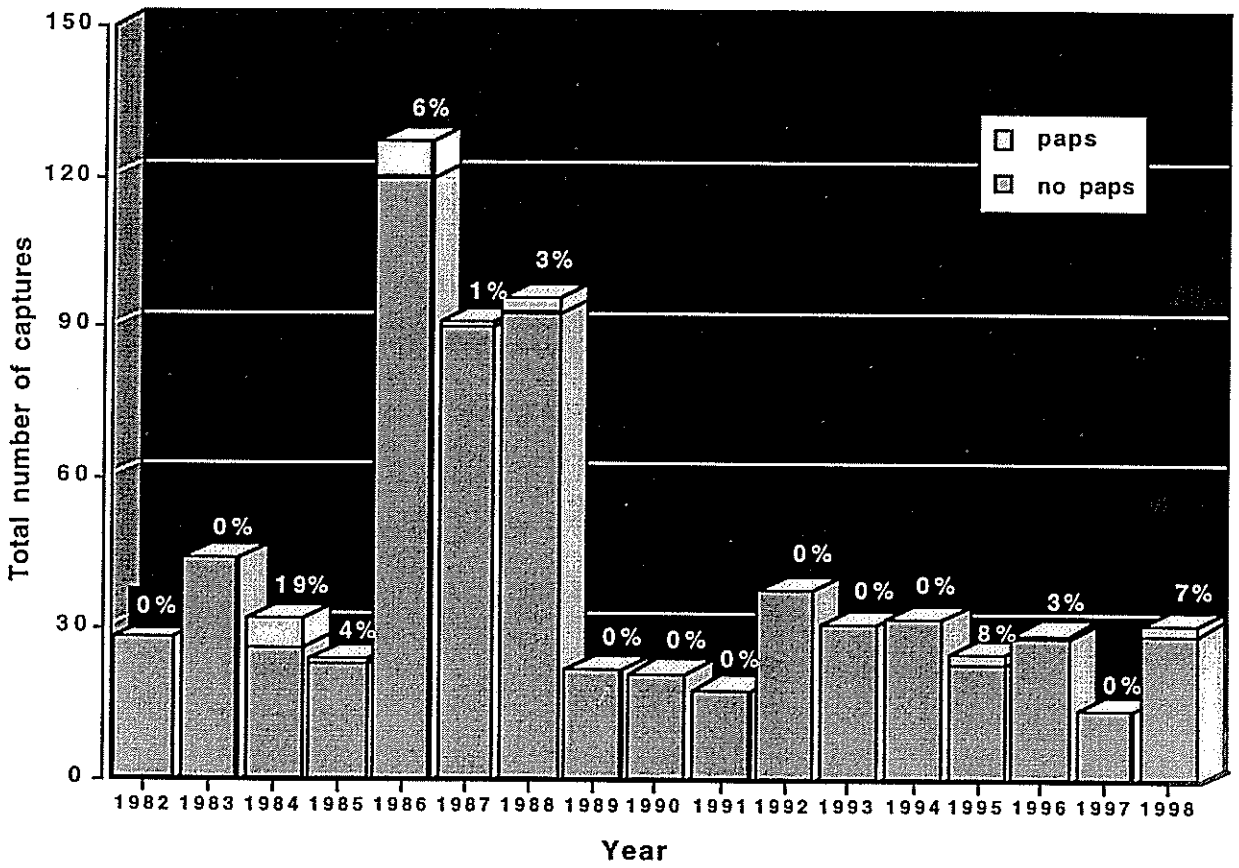

Figure16. Prevalence of fibropapillomatosis in net-captured subadult loggerheads from the central region of the Indian River Lagoon system, shown as a percentage of captures by year from 1982 through 1998.

island and connected by a nearby inlet. Perhaps the term aggregation, or assemblage, would be more appropriate. It is clear that the two groups of turtles are identical in terms of morphometrics and, therefore, age structure. Each time that we look at size and weight parameters they exhibit no differences. The average lagoon green turtle is 43.6 cm SCL and weighs about 12 kg; the average reef green turtle is 43.9 cm SCL and weighs about 12 kg.

Nevertheless, there are factors which seem to argue against the idea that these two groups interact continuously and are in contact regularly. In ten years of study there has been only one instance of a green turtle tagged in one habitat recaptured in the other. That was an individual that was tagged on the reef and then appeared in the lagoon two years later. It would seem that, in spite of the limited scope of the reef operation (restricted to a short period in the summer and producing a sample size of less than 100 each year) there would be a few recoveries of lagoon turtles over the reef if the two groups were mixing freely.l

More compelling, perhaps, is the prevalence of GTFP. The disease is clearly of epizootic proportions in the lagoon group and appears to be gaining in prevalence in recent years. On the other hand, the reef dwellers showed no sign of the disease from 1989 through 1996 and only 8% prevalence in the most recent year. Surely if the badly diseased animals of the lagoon were mixing freely with those of the reef, diseased animals would be encountered in the latter habitat more frequently. Both populations turn over, obviously. Otherwise the size distributions would not remain stable over time. When green turtles leave the lagoon they become "reef dwellers," almost by definition. The normal emigration of lagoon turtles could explain the relatively small numbers of GTFP animals observed in the reef population.

There is a precedent for a situation where marine vertebrates maintain relatively separate nearshore and inshore aggregations. Among bottlenose dolphins there is

one group in Florida that is coastal (nearshore) but separated from another assemblage that is lagoonal (inshore) in its distribution. It is doubtful that these two groups are totally disconnected (everyone has seen dolphins traversing inlets) but marine mammalogists have determined that they are largely autonomous from one another. Something roughly similar may be occurring among juvenile green turtles of the Indian River region of the east Florida coast.

Table 1. Catch per unit effort in km-hrs for net-captured juvenile green turtles and subadult loggerheads in the Indian River Lagoon, Indian River County, Florida, from September, 1997 through August, 1998.

Date	Hours	Length of Net In kilometers	Loggerhead Captures	Green Turtle Captures	Loggerhead LogCPUE	Green Turtle GrnCPUE	Total TotCPUE
19-Sep-97	7.22	0.22	0	0	0.00	0.00	0.00
19-Sep-97	6.43	0.24	2	4	1.30	2.59	3.89
26-Nov-97	4.63	0.46	2	20	0.94	9.38	10.32
28-Nov-97	6.18	0.46	1	18	0.35	6.33	6.68
15-Dec-97	3.43	0.46	0	0	0.00	0.00	0.00
19-Jan-98	4.60	0.46	0	15	0.00	7.09	7.09
24-Feb-98	4.08	0.46	2	10	1.06	5.32	6.39
25-Feb-98	4.35	0.46	2	22	1.00	10.99	11.99
5-May-98	2.32	0.46	3	2	2.82	1.88	4.69
12-May-98	3.15	0.46	4	9	2.76	6.21	8.97
15-May-98	4.97	0.46	1	9	0.44	3.94	4.38
19-May-98	4.02	0.46	3	1	1.62	0.54	2.16
20-May-98	3.50	0.46	0	6	0.00	3.73	3.73
29-May-98	2.68	0.46	1	7	0.81	5.67	6.48
9-Jun-98	3.22	0.46	0	4	0.00	2.70	2.70
19-Jun-98	2.10	0.46	2	6	2.07	6.21	8.28
29-Jun-98	3.70	0.46	2	3	1.18	1.76	2.94
1-Jul-98	2.22	0.46	0	1	0.00	0.98	0.98
6-Jul-98	2.78	0.46	1	2	0.78	1.56	2.34
13-Jul-98	2.48	0.46	1	4	0.88	3.50	4.38
20-Jul-98	1.17	0.46	0	8	0.00	14.91	14.91
23-Jul-98	3.08	0.46	2	7	1.41	4.94	6.35
3-Aug-98	2.83	0.46	5	5	3.84	3.84	7.67
7-Aug-98	1.07	0.46	1	1	2.04	2.04	4.08
	Total Net hours	Total Km-hrs	Caretta Captures	Chelonia Captures	Caretta CPUE	Chelonia CPUE	Total CPUE
	86.21	39.66	35	164	1.05	4.42	5.47

Table 2 Seasonal catch per unit effort in km-hrs for net-captured juvenile green turtles and subadult loggerheads in the Indian River Lagoon, Indian River County, Florida, from September, 1997 through August, 1998.

Season	Hours	Length of Net In kilometers	Loggerhead Captures	Green Turtle Captures	Loggerhead LogCPUE	Green Turtle GmCPUE	Total TotCPUE
Fall							
26-Nov-97	4.63	0.46	2	20	0.94	9.38	10.32
28-Nov-97	6.18	0.46	1	18	0.35	6.33	6.68
15-Dec-97	3.43	0.46	0	0	0.00	0.00	0.00
	Total Net hours	Total Km-hrs	Caretta Captures	Chelonia Captures	Caretta CPUE	Chelonia CPUE	Total CPUE
	14.25	6.55	3	38	0.43	5.24	5.67
Winter							
19-Jan-98	4.60	0.46	0	15	0.00	7.09	7.09
24-Feb-98	4.08	0.46	2	10	1.06	5.32	6.39
25-Feb-98	4.35	0.46	2	22	1.00	10.99	11.99
	Total Net hours	Total Km-hrs	Caretta Captures	Chelonia Captures	Caretta CPUE	Chelonia CPUE	Total CPUE
	13.03	6.00	4	47	0.69	7.80	8.49
Spring							
5-May-98	2.32	0.46	3	2	2.82	1.88	4.69
12-May-98	3.15	0.46	4	9	2.76	6.21	8.97
15-May-98	4.97	0.46	1	9	0.44	3.94	4.38
19-May-98	4.02	0.46	3	1	1.62	0.54	2.16
20-May-98	3.50	0.46	0	6	0.00	3.73	3.73
29-May-98	2.68	0.46	1	7	0.81	5.67	6.48
9-Jun-98	3.22	0.46	0	4	0.00	2.70	2.70
19-Jun-98	2.10	0.46	2	6	2.07	6.21	8.28
	Total Net hours	Total Km-hrs	Caretta Captures	Chelonia Captures	Caretta CPUE	Chelonia CPUE	Total CPUE
	25.95	11.94	14	44	1.31	3.86	5.17
Summer							
29-Jun-98	3.70	0.46	2	3	1.18	1.76	2.94
1-Jul-98	2.22	0.46	0	1	0.00	0.98	0.98
6-Jul-98	2.78	0.46	1	2	0.78	1.56	2.34
13-Jul-98	2.48	0.46	1	4	0.88	3.50	4.38
20-Jul-98	1.17	0.46	0	8	0.00	14.91	14.91
23-Jul-98	3.08	0.46	2	7	1.41	4.94	6.35
3-Aug-98	2.83	0.46	5	5	3.84	3.84	7.67
7-Aug-98	1.07	0.46	1	1	2.04	2.04	4.08
19-Sep-97	7.22	0.22	0	0	0.00	0.00	0.00
19-Sep-97	6.43	0.24	2	4	1.30	2.59	3.89
	Total Net hours	Total Km-hrs	Caretta Captures	Chelonia Captures	Caretta CPUE	Chelonia CPUE	Total CPUE
	32.98	12.03	14	35	1.14	3.61	4.75

Table 3. Catch per unit effort in km-hrs for net-captured marine turtles over Sabellariid worm reefs in Indian River County, Florida, in 1998.

Date	Hours	Net Length in kilometers	Loggerhead Captures	Green Turtle Captures	Loggerhead LogCPUE	Green Turtle GrnCPUE	Total TotCPUE
1-Jun-98	1.58	0.22	0	1	0	1.37	1.37
2-Jun-98	1.27	0.22	0	0	0	0.00	0.00
2-Jun-98	0.77	0.22	0	0	0	0.00	0.00
5-Jun-98	0.93	0.22	0	0	0	0.00	0.00
5-Jun-98	1.15	0.22	0	8	0	15.12	15.12
12-Jun-98	1.68	0.22	0	10	0	12.91	12.91
16-Jun-98	1.15	0.22	0	3	0	5.67	5.67
26-Jun-98	1.20	0.22	0	12	0	21.74	21.74
3-Jul-98	1.08	0.22	0	6	0	12.04	12.04
10-Jul-98	1.17	0.22	0	1	0	1.86	1.86
17-Jul-98	0.42	0.22	0	0	0	0.00	0.00
17-Jul-98	1.63	0.22	0	4	0	5.32	5.32
22-Jul-98	0.72	0.22	0	5	0	15.17	15.17
	Total Net Hours	Total Km-hrs	Caretta Captures	Chelonia Captures	Caretta CPUE	Chelonia CPUE	Total CPUE
	14.75	3.25	0	50	0	7.02	7.02

Table 4. Tagging and morphometric data for one Kemp's ridley net-captured in the Indian River Lagoon, Indian River County, Florida, during summer, 1998.

Tag Numbers	Capture Date	Paps	Carapace Length OC (cm)	Carapace Width OC (cm)	Greatest Length SL (cm)	Carapace Length SL (cm)	Carapace Width SL (cm)	Plastron Length (cm)	Body Depth (cm)	Head Width (cm)	Wt. (kg)
BP7371 X6584	7/20/98	no	50.2	46.8	48.8	48.5	43.2	36.8	19	10	15.4

Table 5. Tagging and morphometric data for juvenile green turtles net-captured in the Indian River Lagoon, Indian River County, Florida from September, 1997 through August, 1998. Excludes multiple within-year recaptures.

Tag Numbers	Capture Date	Paps	Carapace Length OC (cm)	Carapace Width OC (cm)	Greatest Length SL (cm)	Carapace Length SL (cm)	Carapace Width SL (cm)	Plastron Length (cm)	Body Depth (cm)	Head Width (cm)	Wt. (kg)
BP5668 X6191	9/19/97	yes	-	-	-	-	-	-	-	-	-
BP7155 X6381	9/19/97	no	41.7	37.0	40.5	40.2	32.4	33.3	14.6	6.3	7.9
X6379	9/19/97	yes	36.1	31.0	34.3	34.0	27.2	29.6	13.1	5.3	5.9
X6382	9/19/97	yes	47.2	41.4	45.0	45.0	34.2	38.4	18.5	6.8	-
BP7157 X6386	11/26/97	yes	60.2	52.7	57.3	56.4	45.1	49.1	20.8	8.9	28.0
BP7158 X6387	11/26/97	yes	45.4	37.8	42.9	42.7	33.7	35.3	15.3	6.9	13.0
BP7160 X6390	11/26/97	no	66.1	54.1	61.4	60.4	46.2	49.4	22.3	8.6	37.5
BP7161 X6391	11/26/97	yes	35.9	30.2	33.7	33.7	26.8	28.2	12.5	5.7	5.2
BP7162 P2651	11/26/97	no	56.0	46.5	45.4	52.5	40.5	45.4	19.4	8.2	25.0
BP7163 P2654	11/26/97	yes	35.1	31.5	33.7	33.7	27.4	29.0	12.6	5.6	4.9
BP7164 X6395	11/26/97	yes	54.7	46.6	51.6	51.2	40.0	43.7	19.8	7.7	21.0
BP7165 X6396	11/26/97	no	49.9	42.1	47.3	47.0	37.3	39.5	16.2	7.2	13.0
BP7166 X6399	11/26/97	no	42.2	36.8	40.5	40.2	31.8	33.5	14.3	6.3	8.1
BP7167 X6394	11/26/97	no	53.5	43.9	50.3	50.2	39.2	42.2	18.0	7.7	23.5
BP7168 X6400	11/26/97	yes	41.7	35.8	39.9	39.8	31.3	33.4	14.8	6.4	8.6
BP7169 X6397	11/26/97	yes	40.8	34.8	39.6	38.5	30.7	32.5	14.6	6.2	7.2
BP7170 X6393	11/26/97	yes	43.3	37.0	41.3	41.0	32.4	34.9	15.4	6.4	8.7
BP7171 X6398	11/26/97	yes	51.1	42.9	48.9	48.6	36.7	40.3	18.4	7.1	13.0
BP7172 X6383	11/26/97	yes	47.5	40.6	44.9	44.6	35.4	39.2	17.3	7.2	12.6
BP7173 P2652	11/26/97	yes	35.9	29.9	34.2	34.1	26.9	28.1	12.2	5.3	4.8
BP7174 X6392	11/26/97	yes	34.3	31.0	32.9	32.5	26.1	26.5	12.6	5.4	4.4
BP7175 X6384	11/26/97	yes	41.6	34.3	39.3	39.0	30.6	32.2	13.8	6.6	7.6
BP7176 P2653	11/26/97	no	51.4	43.6	48.3	48.3	37.4	40.4	17.5	7.5	22.0
SST862 SST863	11/26/97	yes	69.0	56.2	63.7	63.7	48.0	55.2	24.2	8.6	36.0
BP7177 P2671	11/28/97	no	53.3	45.2	50.4	50.4	39.2	42.2	17.8	7.5	23.0
BP7178 P2672	11/28/97	yes	36.4	30.8	35.3	35.1	37.5	29.3	12.8	5.7	5.1
BP7179 P2673	11/28/97	yes	46.1	40.2	44.2	43.7	34.3	37.9	16.5	6.7	11.0
BP7185 P2655	11/28/97	yes	38.3	32.3	36.7	36.3	28.9	29.4	12.6	5.6	5.6
BP7186 P2656	11/28/97	no	43.8	38.7	42.2	41.5	-	35.7	15.7	6.8	10.2
BP7187 P2657	11/28/97	no	63.1	56.9	58.3	58.7	45.2	49.6	20.0	9.4	30.0
BP7188 P2658	11/28/97	yes	34.5	30.2	32.8	32.5	27.2	27.8	12.8	5.7	5.0
BP7189 P2659	11/28/97	yes	42.3	37.5	40.3	40.2	33.1	34.9	15.9	6.7	9.3
BP7190 P2660	11/28/97	yes	44.1	37.7	42.0	41.6	33.9	35.8	15.3	6.6	9.0
BP7191 P2661	11/28/97	no	64.3	58.1	59.4	58.9	48.3	52.6	26.4	9.7	37.0
BP7192 P2662	11/28/97	yes	46.1	31.7	34.1	34.1	27.6	29.7	12.7	5.7	5.2
BP7193 P2663	11/28/97	yes	36.4	29.7	34.4	34.3	26.2	29.5	12.2	5.7	5.2
BP7194 P2664	11/28/97	yes	39.8	33.9	37.4	37.3	29.0	30.9	14.1	6.3	7.1
BP7196 P2666	11/28/97	yes	42.5	37.1	40.5	40.1	32.7	35.8	15.0	6.5	13.0
BP7197 P2667	11/28/97	yes	37.7	31.8	35.9	35.8	29.0	31.1	13.6	5.9	6.6

Table x5. continued

Tag Numbers	Capture Date	Paps	Carapace Length OC (cm)	Carapace Width OC (cm)	Greatest Length SL (cm)	Carapace Length SL (cm)	Carapace Width SL (cm)	Plastron Length (cm)	Body Depth (cm)	Head Width (cm)	Wt. (kg)
BP7198 P2668	11/28/97	yes	41.7	34.5	39.3	39.3	29.6	32.5	-	6.1	7.7
BP7199 P2669	11/28/97	yes	52.6	28.1	49.7	49.3	38.8	41.2	19.2	7.7	20.0
BP7200 P2670	11/28/97	yes	34.9	30.2	33.8	33.6	27.5	28.3	12.2	5.5	5.4
BP6641 X4841	1/19/98	yes	41.1	34.3	38.6	38.5	35.2	34.3	15.1	6.1	8.0
BP7180 P2674	1/19/98	yes	35.0	31.4	34.6	33.9	27.6	29.3	13.7	6.4	5.8
BP7181 X6476	1/19/98	yes	47.3	40.9	45.4	45.1	35.9	38.3	16.3	7.0	11.0
BP7182 X6477	1/19/98	no	50.6	45.5	47.6	47.5	38.1	40.5	18.7	7.2	18.0
BP7183 X6478	1/19/98	no	45.4	37.8	43.1	43.0	33.0	36.0	15.2	6.6	10.0
BP7184 X6480	1/19/98	yes	31.7	27.0	31.0	30.9	23.8	26.5	11.0	5.0	3.7
BP7201 X6481	1/19/98	yes	56.5	50.9	53.4	53.0	42.9	45.2	19.2	7.4	27.0
BP7202 X6482	1/19/98	yes	53.1	46.2	48.5	48.5	38.9	43.4	19.0	7.8	24.0
BP7203 X6483	1/19/98	yes	36.7	30.2	34.8	34.6	26.4	28.9	12.7	5.7	5.2
BP7204 X6484	1/19/98	yes	40.2	35.1	37.8	37.8	31.1	31.2	13.1	6.5	7.1
BP7205 X6486	1/19/98	no	64.6	54.9	60.7	60.7	46.5	51.5	22.5	8.8	35.0
BP7206 X6086	1/19/98	no	47.3	41.2	43.5	43.5	33.7	37.5	17.7	7.0	12.0
BP7207 X6487	1/19/98	yes	41.8	34.7	39.9	39.9	29.6	33.4	15.8	6.3	8.5
BP7208 X6488	1/19/98	yes	49.0	40.9	46.1	46.0	37.1	41.5	17.3	6.9	17.0
BP7209 X6489	1/19/98	yes	40.3	35.5	38.8	38.5	31.2	31.5	15.0	6.5	7.5
BP7210 X6451	2/24/98	no	46.6	38.7	43.4	43.4	32.1	35.8	16.7	6.9	10.2
BP7211 X6452	2/24/98	yes	38.4	32.1	36.6	36.4	27.5	31.3	14.7	5.6	6.6
BP7212 X6453	2/24/98	yes	46.0	37.9	43.0	42.9	32.8	36.9	17.1	6.8	10.3
BP7213 X6454	2/24/98	yes	47.1	40.7	44.2	44.2	35.3	37.6	16.1	7.3	11.5
BP7215 X6459	2/24/98	yes	37.8	32.7	35.5	35.3	28.2	29.8	13.4	5.9	6.1
BP7216 X6460	2/24/98	no	47.1	40.8	44.0	43.8	34.9	36.4	17.9	6.8	12.0
BP7218 X6491	2/24/98	yes	38.7	33.6	36.4	36.2	28.3	31.5	13.8	5.9	6.2
BP7219 X6492	2/24/98	yes	33.4	29.5	32.3	31.9	25.1	28.2	12.6	5.4	4.5
BP7220 X6493	2/24/98	yes	41.4	35.7	39.0	39.0	31.3	33.8	14.6	6.2	8.1
BP7221 X6494	2/24/98	yes	37.8	33.3	35.5	35.0	28.0	29.9	14.7	5.8	6.1
BP4564 BP7239	2/25/98	yes	42.2	36.7	40.2	40.0	31.7	35.6	16.0	6.6	9.4
BP5623 BP7241	2/25/98	no	40.3	33.9	38.3	38.0	30.2	32.0	13.5	6.4	6.8
BP5635 BP7233	2/25/98	no	38.4	31.8	35.7	35.5	27.7	30.4	13.5	5.7	6.0
BP7222 X6495	2/25/98	yes	68.6	55.9	64.3	64.0	47.9	54.2	23.3	9.3	39.0
BP7223 X6496	2/25/98	no	58.5	50.5	55.3	54.8	44.5	47.5	20.8	3.5	29.0
BP7224 X6497	2/25/98	yes	33.7	32.5	31.8	31.5	25.9	27.1	14.1	5.1	-
BP7225 X6498	2/25/98	yes	42.0	36.6	40.1	39.7	32.8	34.1	16.0	6.4	8.6
BP7226 X6499	2/25/98	no	46.4	39.1	37.3	43.4	34.3	37.3	16.7	7.1	11.3
BP7228 X6500	2/25/98	yes	40.4	33.1	37.6	37.3	23.6	31.7	15.3	6.9	7.0
BP7229 X6463	2/25/98	yes	43.5	37.2	41.4	41.2	33.1	35.4	15.8	6.6	10.0
BP7230 X6464	2/25/98	yes	40.4	34.5	37.9	37.7	30.0	31.9	15.5	6.8	7.1
BP7231 X6465	2/25/98	no	47.7	40.7	44.9	44.8	34.0	38.2	17.2	6.9	12.8
BP7232 X6467	2/25/98	yes	36.5	28.1	34.5	34.4	31.1	28.9	13.2	5.8	6.0
BP7234 X6469	2/25/98	yes	45.2	38.1	42.7	42.4	32.7	36.0	15.9	6.8	10.5

Table 5. continued

Tag Numbers	Capture Date	Paps	Carapace Length OC (cm)	Carapace Width OC (cm)	Greatest Length SL (cm)	Carapace Length SL (cm)	Carapace Width SL (cm)	Plastron Length (cm)	Body Depth (cm)	Head Width (cm)	Wt. (kg)
BP7235 X6471	2/25/98	no	54.0	46.6	50.4	50.4	39.3	43.5	19.3	8.1	24.0
BP7236 X6473	2/25/98	no	68.6	60.3	63.4	63.3	49.9	53.5	27.9	10.1	43.0
BP7237 X6472	2/25/98	no	55.6	47.5	53.0	52.8	40.0	45.3	20.6	7.8	26.0
BP7238 X6474	2/25/98	yes	43.9	38.1	41.8	41.5	33.4	36.4	14.6	6.8	8.5
BP7240 X6503	2/25/98	yes	33.2	28.8	31.9	31.7	24.9	26.5	12.3	5.5	4.5
BP7249 X6502	2/25/98	no	54.7	51.5	51.5	51.3	42.3	43.7	19.8	7.5	22.0
BP7250 X6475	2/25/98	yes	70.3	63.3	66.6	66.6	49.6	56.3	28.4	9.0	44.0
BP7243 X6505	5/5/98	no	54.3	46.2	51.4	51.4	40.0	44.0	20.5	8.0	17.4
BP7245 X6507	5/5/98	yes	37.2	34.6	36.4	36.2	30.3	30.6	13.0	5.9	5.8
BP7246 X6508	5/12/98	yes	45.8	40.9	44.2	43.7	35.0	37.2	16.6	6.4	10.5
BP7247 X6509	5/12/98	yes	41.4	36.2	39.8	39.8	31.1	33.3	14.7	6.2	8.2
BP7251 X6510	5/12/98	yes	43.7	38.7	42.3	41.7	32.9	36.4	15.6	6.7	10.2
BP7252 X6511	5/12/98	yes	54.7	52.3	52.9	52.8	42.3	42.7	22.2	8.3	24.0
BP7253 X6512	5/12/98	yes	39.4	34.6	37.2	36.9	29.3	31.4	14.4	6.2	7.1
BP7254 X6513	5/12/98	yes	38.6	35.1	36.3	36.2	29.4	30.3	13.9	6.1	6.1
BP7257 X6516	5/12/98	yes	32.3	28.2	31.4	31.3	25.4	26.8	11.5	5.6	4.0
BP7258 X6090	5/12/98	no	42.1	36.9	40.2	40.0	32.3	34.6	16.1	6.8	8.8
BP6645 X6522	5/15/98	yes	43.2	35.9	40.8	40.7	30.0	33.0	16.1	6.4	8.8
BP7261 X6519	5/15/98	yes	32.6	29.5	30.7	30.5	25.7	27.2	12.6	5.5	4.8
BP7262 X6520	5/15/98	yes	51.9	45.1	49.6	49.3	37.3	40.5	18.9	8.1	18.0
BP7263 X6521	5/15/98	no	-	39.1	43.5	43.2	34.2	36.7	18.0	6.6	10.6
BP7264 X6524	5/15/98	yes	41.8	34.9	40.4	40.1	30.4	33.5	15.2	6.5	8.5
BP7266 X6426	5/15/98	yes	43.3	38.6	41.0	40.8	33.3	34.7	15.5	6.6	9.4
BP7267 X6427	5/15/98	yes	40.6	36.3	37.5	37.4	30.7	31.4	15.4	6.2	7.5
BP7268 X6428	5/15/98	no	50.2	42.1	46.7	46.9	35.4	38.4	17.9	7.1	18.0
BP7269 X6430	5/19/98	yes	48.5	40.8	46.2	46.1	35.7	37.9	17.0	7.1	12.0
BP7270 X6431	5/20/98	no	52.5	44.0	50.6	50.0	37.7	42.0	17.9	7.2	15.0
BP7271 X6432	5/20/98	yes	45.9	40.8	44.0	43.5	35.8	37.5	17.6	7.1	11.2
BP7272 X6433	5/20/98	no	45.8	37.9	43.0	42.9	33.7	36.2	16.8	7.0	10.3
BP7273 X6434	5/20/98	yes	34.2	29.0	32.8	32.7	26.2	26.8	13.5	5.2	4.7
BP7274 X6436	5/20/98	no	41.6	36.1	39.9	39.9	32.3	31.9	13.7	6.0	7.1
BP7248 X6343	5/29/98	yes	41.2	34.3	38.9	38.9	30.2	34.6	14.6	6.6	7.4
BP7276 X6441	5/29/98	no	63.8	59.1	56.6	56.1	47.9	54.7	29.2	9.9	38.0
BP7277 X6438	5/29/98	yes	36.1	32.3	34.0	34.0	27.2	28.9	13.2	5.9	5.3
BP7278 X6439	5/29/98	yes	41.9	34.7	39.7	39.6	30.6	33.5	15.0	6.3	7.7
BP7279 X6442	5/29/98	yes	35.7	32.1	33.7	33.2	27.6	29.8	14.2	5.9	5.8
X6437 X6440	5/29/98	yes	39.2	33.2	37.3	37.2	28.5	31.7	14.6	5.9	6.6
BP7287 X6446	6/9/98	yes	35.1	30.7	33.3	33.1	27.3	27.5	12.2	5.5	4.5
BP7289 X6445	6/9/98	yes	39.8	36.3	38.0	37.9	30.3	31.9	14.4	6.4	7.2
BP7290 X6447	6/9/98	no	55.2	48.4	52.8	52.6	40.0	43.5	20.3	8.8	18.0
X6328 X6329	6/9/98	yes	38.2	34.7	36.5	36.1	29.7	31.7	14.3	6.7	7.0
BP7303 X6448	6/19/98	yes	31.6	26.4	30.0	29.9	23.3	25.2	11.3	5.3	3.5

Table 5. continued

Tag Numbers	Capture Date	Paps	Carapace Length OC (cm)	Carapace Width OC (cm)	Greatest Length SL (cm)	Carapace Length SL (cm)	Carapace Width SL (cm)	Plastron Length (cm)	Body Depth (cm)	Head Width (cm)	Wt. (kg)
BP7309 X6528	6/19/98	no	52.7	46.1	49.5	49.4	38.3	42.5	19.4	8.8	-
BP7310 X6529	6/19/98	no	59.6	52.7	56.3	56.1	44.2	48.1	22.6	8.8	29.0
BP7356 X6564	7/6/98	yes	45.0	39.3	43.3	42.9	35.0	38.1	16.2	7.0	10.3
BP7357 X6565	7/6/98	yes	48.5	42.5	46.1	45.6	37.1	39.4	17.4	7.5	12.0
BP7312 X6567	7/13/98	yes	37.7	31.6	35.8	35.7	27.6	31.4	14.1	5.2	6.0
BP7376 X6568	7/13/98	yes	47.1	39.2	45.0	44.9	34.7	38.5	17.2	6.7	11.6
BP7363 X6571	7/20/98	no	39.1	33.5	35.9	35.9	29.1	30.4	14.2	6.0	6.2
BP7364 X6573	7/20/98	yes	46.9	40.5	44.4	44.3	35.7	37.6	16.3	6.9	-
BP7365 X6575	7/20/98	yes	48.2	42.4	46.6	46.5	37.2	39.5	15.6	7.5	-
BP7366 X6471	7/20/98	no	55.6	48.3	52.9	52.6	41.2	44.6	18.6	8.7	9.5
BP7367 X6582	7/20/98	yes	56.7	49.0	53.1	53.1	41.7	45.4	22.0	8.1	-
BP7368 X6572	7/20/98	no	73.4	61.9	68.3	68.0	50.2	59.7	26.5	10.3	-
BP7369 X6574	7/20/98	no	64.8	56.5	60.1	60.0	47.6	51.5	23.3	8.3	-
BP7370 X6583	7/20/98	yes	55.5	46.3	52.0	51.8	37.3	42.7	19.1	8.1	-
BP7345 X6560	6/29/98	yes	56.4	49.3	53.3	52.6	43.0	46.5	20.5	8.1	22.0
BP7347 X6562	6/29/98	yes	33.0	27.2	31.7	31.5	24.9	26.7	10.8	5.3	3.7
BP7348 X6563	6/29/98	yes	41.0	34.5	38.5	38.5	29.2	33.4	14.4	5.9	7.1
BP7377 X4828	7/23/98	no	47.4	43.1	44.2	44.2	35.8	40.2	19.3	7.2	-
BP7378 X6589	7/23/98	no	58.5	48.5	54.5	54.4	41.8	44.7	20.6	8.6	-
BP7379 X6588	7/23/98	no	59.9	51.7	56.7	56.4	45.4	49.9	23.2	8.6	-
BP7380 X6585	7/23/98	yes	35.8	30.1	34.1	34.0	27.4	28.5	13.9	5.7	4.9
BP7381 X6587	7/23/98	yes	61.7	54.5	58.3	57.8	48.4	49.0	23.4	8.7	-
BP7382 X6591	7/23/98	no	53.4	43.3	50.8	50.9	36.9	41.6	18.3	7.4	-
X6586	7/23/98	yes	58.4	58.8	56.2	56.2	42.4	46.5	20.4	8.3	-
BP4547 BP7391	8/3/98	yes	44.3	35.7	41.6	41.6	30.4	34.9	15.5	6.7	8.4
BP7386 X6604	8/3/98	no	66.0	54.8	61.8	62.0	46.3	51.4	24.1	9.4	32.6
BP7389 X6598	8/3/98	no	62.0	52.1	58.9	58.6	43.6	29.5	21.0	8.0	27.6
BP7390 X6592	8/3/98	yes	57.1	47.5	53.3	53.5	40.4	45.1	20.5	8.4	22.7
X6171	8/3/98	yes	65.3	56.6	61.7	61.2	47.8	51.4	21.7	8.0	32.2
BP7306 X6450	6/19/98	yes	36.8	32.7	34.2	34.0	26.9	30.7	15.2	5.9	6.2
BP7307 X6526	6/19/98	yes	40.1	35.4	38.8	38.5	31.6	33.6	14.9	6.5	8.3
BP7308 X4767	6/19/98	yes	44.5	37.0	41.2	41.9	31.7	35.5	16.2	6.3	9.4
BP5640 BP7397	8/7/98	yes	47.4	41.2	45.8	45.5	35.8	39.2	17.8	7.4	13.6

Table 5. continued

Tag Numbers	Capture Date	Paps	Carapace Length OC (cm)	Carapace Width OC (cm)	Greatest Length SL (cm)	Carapace Length SL (cm)	Carapace Width SL (cm)	Plastron Length (cm)	Body Depth (cm)	Head Width (cm)	Wt. (kg)
	pap-afflicted	109	70%								
Number of individuals		156									
n			154	155	155	155	154	155	154	155	140
Mean			46.3	39.8	43.7	43.6	34.4	37.0	16.7	6.9	12.8
Median			44.2	37.8	41.8	41.6	33.1	35.7	15.9	6.7	8.9
Standard deviation			9.56	8.47	8.76	8.76	6.60	7.53	3.66	1.18	9.42
Range			31.6 to 73.4	26.4 to 63.3	30.0 to 68.3	29.9 to 68.0	23.3 to 50.2	25.2 to 59.7	10.8 to 29.2	3.5 to 10.3	3.5 to 44.0

Table 6. Tagging and morphometric data for subadult loggerheads net-captured in the Indian River Lagoon, Indian River County, Florida, from September, 1997 through August, 1998. Excludes multiple within-year recaptures.

Tag Numbers	Capture Date	Paps	Carapace Length OC (cm)	Carapace Width OC (cm)	Greatest Length SL (cm)	Carapace Length SL (cm)	Carapace Width SL (cm)	Plastron Length (cm)	Body Depth (cm)	Head Width (cm)	Wt. (kg)
BP7153 X6378	9/19/97	no	71.2	68.2	66.3	65.2	55.6	49.4	27	13.3	50.5
BP7154 X6380	9/19/97	no	65.7	63.1	60.9	60	50.5	48.4	24.3	12.2	36
BP7156 X6389	11/26/97	no	60.4	58.0	55.2	54.3	45.0	43.0	23.2	11.5	28.5
BP7159 P2675	11/26/97	no	67.5	59.9	61.7	61.1	48.6	45.5	24.6	12.5	36.0
BP7195 P2665	11/28/97	yes	71.1	65.8	67.6	66.2	51.4	53.1	27.0	14.6	48.0
BP7214 X6456	2/24/98	no	68.1	65.4	64.3	62.4	51.8	47.4	26.6	11.8	36.0
BP7217 X6490	2/24/98	no	65.3	60.4	59.7	58.8	46.6	45.0	24.6	11.9	37.0
BP7143 X6323	2/25/98	no	62.5	59.4	58.7	57.0	45.5	43.7	23.3	13.0	34.0
BP7227 X6462	2/25/98	no	70.5	67.5	66.3	64.1	52.3	52.0	25.9	13.0	42.0
BP7244 X6506	5/5/98	no	77.5	70.5	71.4	70.2	55.7	54.1	27.5	14.9	52.0
SSA557 SSA558	5/5/98	no	79.4	70.6	77.3	76.2	58.4	55.6	26.3	14.3	64.0
SSA567 SSA568	5/5/98	no	53.4	49.5	49.7	49.2	40.8	38.5	22.3	10.1	20.0
BP7255 X6514	5/12/98	no	63.8	60.4	61.6	60.2	49.5	48.3	23.9	12.4	31.5
BP7256 X6515	5/12/98	no	83.4	59.9	60.5	59.6	48.8	46.0	24.5	12.4	37.0
BP7259 X6517	5/12/98	no	63.6	62.3	59.7	59.1	49.4	44.4	23.9	13.1	37.0
BP7260 X6518	5/12/98	yes	74.3	67.3	70.8	69.0	54.8	53.5	27.6	14.7	58.0
BP7265 X6525	5/15/98	no	65.1	60.8	59.6	58.8	48.0	47.7	27.2	12.5	37.0
BP7275 X6429	5/19/98	yes	69.6	66.9	67.0	65.5	54.1	48.8	26.5	14.8	43.0
BP7304 N5921	6/19/98	no	69.6	65.7	66.9	65.6	55.4	49.4	25.6	13.2	47.0
BP7305 X6449	6/19/98	no	68.3	64.8	66.4	65.7	54.1	50.5	22.4	14.7	45.0
BP7346 X6561	6/29/98	no	79.7	76.1	75.4	73.4	59.2	59.1	30.6	13.9	-
BP7355 P4884	7/6/98	no	61.4	56.7	58.0	57.8	46.1	45.0	24.7	11.9	-
BP7383 X6590	7/23/98	no	59.3	58.1	57.8	56.4	45.2	43.7	22.8	12.3	-
SSR021 SSR023	7/23/98	no	62.3	56.1	56.9	56.1	44.4	44.9	24.5	11.9	-
BP7385 X6593	8/3/98	no	68.4	65.8	63.5	62.8	54.1	48.2	26.0	12.3	37.2
BP7387 X6595	8/3/98	no	84.0	74.4	78.8	77.6	57.5	58.4	31.1	15.4	-
BP7388 X6597	8/3/98	no	59.0	57.7	56.2	55.9	45.4	43.7	20.9	11.0	27.2
SSA539 SSA540	8/3/98	no	61.5	58.9	56.7	56.7	45.9	42.5	19.6	12.2	23.1
SWF-Cc9830 X6596	8/3/98	no	69.8	63.5	65.1	63.6	51.3	48.5	25.4	12.6	37.2
	pap-afflicted	3	10%								
Number of individuals		29									
n			29	29	29	29	29	29	29	29	24
Mean			68.1	63.2	63.4	62.4	50.5	48.2	25.2	12.9	39.3
Median			68.1	63.1	61.7	61.1	50.5	48.2	24.7	12.5	37.0
Standard deviation			7.46	5.80	6.83	6.55	4.78	4.86	2.52	1.29	10.40
Range			53.4 to 84.0	49.5 to 76.1	49.7 to 78.8	49.2 to 77.6	40.8 to 59.2	38.5 to 59.1	19.6 to 31.1	10.1 to 15.4	20.0 to 64.0

Table 7. Tagging and morphometric data for adult female loggerheads net-captured in the Indian River Lagoon, Indian River County, Florida, during spring and summer, 1998

Tag Numbers	Capture Date	Paps	Carapace Length OC (cm)	Carapace Width OC (cm)	Greatest Length SL (cm)	Carapace Length SL (cm)	Carapace Width SL (cm)	Plastron Length (cm)	Body Depth (cm)	Head Width (cm)	Wt. (kg)
P2645 P2647	5/19/98	no	95.6	91.8	90.7	89.0	65.8	-	-	18.5	100.0
X6558 X6559	6/29/98	no	98.6	89.5	-	87.0	66.9	-	-	17.4	-
X6569 X6570	7/13/98	no	97.9	91.6	90.6	89.1	65.6	-	-	18.2	-
Number of individuals		3									
n			3	3	2	3	3	-	-	3	1
Mean			97.4	91.0	90.7	88.4	66.1	-	-	18.0	100.0
Median			97.9	91.6	90.7	89.0	65.8	-	-	18.2	100.0
Range			95.6	89.5	90.6	87.0	65.6	-	-	17.4	100.0
			to	to	to	to	to	-	-	to	to
			98.6	91.8	90.7	89.1	66.9	-	-	18.5	100.0

Table 8. Tagging and morphometric data for juvenile green turtles net-captured over Sabellariid worm reefs, Indian River County, Florida from September, 1997 through August, 1998. Excludes multiple within-year recaptures.

Tag Numbers	Capture Date	Paps	Carapace Length OC (cm)	Carapace Width OC (cm)	Greatest Length SL (cm)	Carapace Length SL (cm)	Carapace Width SL (cm)	Plastron Length (cm)	Body Depth (cm)	Head Width (cm)	Wt. (kg)
BP7288 P2648	6/1/98	no	63.4	55.4	60.8	60.5	46.1	48.9	23.8	8.9	32.0
BBD246 P2680	6/5/98	yes	39.6	32.6	36.6	37.0	28.3	30.9	14.4	6.2	7.1
BP7280 P2681	6/5/98	no	55.8	50.0	52.6	51.9	42.2	43.7	21.2	8.0	24.0
BP7281 P2649	6/5/98	no	51.5	43.2	48.7	48.6	36.8	40.0	18.8	7.3	25.0
BP7282 P2650	6/5/98	no	44.1	36.5	41.7	41.7	32.5	34.6	15.3	6.7	9.4
BP7283 P2676	6/5/98	no	52.8	45.6	50.4	50.4	39.6	42.9	20.6	7.9	26.0
BP7284 P2677	6/5/98	no	38.4	31.5	35.4	35.5	27.5	29.8	16.0	6.0	6.7
BP7285 P2678	6/5/98	no	40.9	36.0	38.9	38.4	30.3	31.4	15.5	6.5	8.3
BP7286 P2682	6/5/98	no	44.6	39.5	41.9	41.8	34.3	34.1	16.1	6.6	10.1
BP7291 P2683	6/12/98	no	48.6	41.5	46.4	46.1	34.5	39.1	18.4	7.6	13.4
BP7292 P2684	6/12/98	no	46.5	41.1	44.3	44.3	34.9	36.2	17.4	6.8	11.4
BP7293 P2685	6/12/98	no	54.5	46.2	50.4	50.6	39.4	42.2	20.7	7.7	18.0
BP7294 P2686	6/12/98	no	39.6	33.7	37.9	37.8	29.8	30.7	15.1	6.3	7.4
BP7295 P2687	6/12/98	no	32.9	28.1	32.3	32.9	25.8	26.2	11.5	5.6	4.1
BP7296 P2688	6/12/98	no	40.7	34.6	38.7	39.1	30.2	31.3	13.8	5.8	6.9
BP7297 P2689	6/12/98	yes	46.4	38.3	43.7	43.7	34.4	35.5	15.8	6.4	10.4
BP7298 P2690	6/12/98	no	50.6	40.6	47.2	47.4	33.8	39.7	18.7	6.8	-
BP7299 P2691	6/12/98	no	59.3	51.5	56.0	55.9	43.2	46.8	21.9	8.3	32.0
BP7300 P2692	6/12/98	yes	44.3	38.9	42.0	41.7	33.6	34.6	17.4	7.0	10.2
BP7093 N9020	6/16/98	no	37.7	32.7	35.7	35.6	28.5	29.8	12.8	7.0	5.8
BP7301 P2694	6/16/98	no	38.6	32.1	36.2	36.2	27.1	29.9	14.1	6.0	6.0
BP7302 P2693	6/16/98	no	46.1	39.7	42.9	42.9	32.9	35.4	16.6	6.9	10.3
BP7333 P2697	6/26/98	no	-	-	-	-	-	-	-	-	-
BP7334 P2699	6/26/98	no	53.9	46.0	50.7	50.9	39.9	41.7	19.7	7.7	26.0
BP7335 X6552	6/26/98	no	47.7	42.1	43.9	44.3	35.8	37.0	18.0	7.5	12.9
BP7336 P2695	6/26/98	no	43.4	36.7	40.7	40.5	30.8	32.5	16.4	6.3	8.5
BP7337 X6553	6/26/98	no	29.7	25.5	28.4	28.2	23.0	24.3	10.7	5.3	2.9
BP7338 X6556	6/26/98	no	31.1	25.9	29.9	29.7	21.3	24.3	10.8	5.1	3.1
BP7339 P2698	6/26/98	no	43.7	37.8	41.6	41.4	31.9	34.7	14.9	6.9	8.7
BP7340 X6555	6/26/98	no	30.6	28.6	29.3	29.0	24.4	24.6	11.0	5.4	3.3
BP7341 X6557	6/26/98	yes	36.4	30.3	33.9	34.1	26.0	29.5	13.7	5.8	5.3
BP7342 X6554	6/26/98	no	38.8	31.8	37.0	36.8	27.3	31.2	13.9	6.0	6.2
BP7343 P2696	6/26/98	no	67.5	60.3	62.7	62.5	50.3	51.2	24.6	9.9	42.5
BP7344 P2700	6/26/98	no	32.4	29.9	31.1	30.9	26.3	22.4	11.5	5.6	4.1
BP7349 P4876	7/3/98	no	58.5	51.0	55.6	55.6	42.7	46.6	20.7	8.8	21.0
BP7350 P4877	7/3/98	no	43.9	37.6	41.0	41.2	31.6	34.1	15.4	6.6	8.6
BP7351 P4878	7/3/98	no	38.8	30.5	36.5	36.5	27.2	29.9	13.4	5.9	5.7
BP7352 P4880	7/3/98	no	42.1	33.8	39.9	39.8	29.4	32.4	14.3	6.4	7.6
BP7353 P4882	7/3/98	no	42.8	35.6	40.6	40.5	31.8	33.5	15.8	6.6	8.8

Table 8 continued

Tag Numbers	Capture Date	Paps	Carapace Length OC (cm)	Carapace Width OC (cm)	Greatest Length SL (cm)	Carapace Length SL (cm)	Carapace Width SL (cm)	Plastron Length (cm)	Body Depth (cm)	Head Width (cm)	Wt. (kg)
BP7354 P4883	7/3/98	no	37.5	33.1	35.7	35.4	28.2	30.8	13.8	5.9	6.0
BP7311 X6566	7/10/98	no	42.9	36.2	40.7	40.6	31.0	33.7	15.4	6.5	8.4
BP7358 P4886	7/17/98	no	43.9	38.5	41.7	41.4	32.6	35.6	16.2	7.2	-
BP7359 P4887	7/17/98	no	54.8	46.5	51.4	51.4	39.7	41.4	19.2	8.1	-
BP7360 P4888	7/17/98	no	64.7	53.8	61.0	60.6	44.4	49.1	22.4	8.9	-
BP7361 P4889	7/17/98	no	59.0	49.1	55.2	55.0	40.5	45.1	23.1	7.5	-
BP7362 P4890	7/22/98	no	54.0	43.9	51.1	50.9	39.0	43.1	18.1	8.2	-
BP7372 P4395	7/22/98	no	35.6	31.2	33.3	33.3	25.4	28.8	13.2	6.0	5.1
BP7373 P4892	7/22/98	no	69.1	60.0	64.3	64.2	51.3	53.3	23.0	9.0	-
BP7374 P4893	7/22/98	no	63.0	52.9	58.7	58.3	43.9	49.0	24.5	8.0	-
BP7375 P4894	7/22/98	no	64.4	59.5	60.6	60.0	47.8	51.9	24.1	8.4	-
	pap-afflicted	4	8%								
Number of individuals		50									
n			49	49	49	49	49	49	49	49	40
Mean			46.7	39.9	44.0	43.9	34.1	36.4	17.0	7.0	12.0
Median			44.1	38.3	41.7	41.7	32.6	34.6	16.1	6.8	8.6
Standard deviation			10.28	9.13	9.53	9.46	7.31	7.93	3.89	1.12	9.34
Range			29.7 to 69.1	25.5 to 60.3	28.4 to 64.3	28.2 to 64.2	21.3 to 51.3	22.4 to 53.3	10.7 to 24.6	5.1 to 9.9	2.9 to 42.5

Table 9. Results of testosterone analysis from samples taken from juvenile green turtles and subadult loggerheads captured in the central region of the Indian River Lagoon, Indian River County, Florida, received between September, 1997 and August, 1998.

Tag Numbers	Date	Species	Carapace Length sl (cm)	Weight (kg)	Sex
BP5588 X6097	9/21/95	Caretta caretta	72.6	55.5	M
BP5589 X6098	9/21/95	Caretta caretta	55.2	34.0	M
BP5590 n/a	9/21/95	Caretta caretta	66.3	51.0	F
BP5552 X6032	9/22/95	Caretta caretta	66.0	49.0	M
BP5591 X6099	9/22/95	Chelonia mydas	53.0	28.0	F
BP5592 X6100	9/22/95	Caretta caretta	63.7	49.5	U
BP5594 X6128	9/22/95	Caretta caretta	59.9	40.0	U
BBE181 QQJ214	11/21/95	Chelonia mydas	32.6	5.1	F
BP5599 X6107	11/21/95	Chelonia mydas	37.4	6.7	M
BP5600 X6108	11/21/95	Chelonia mydas	37.3	6.5	M
BP5601 X6110	11/21/95	Caretta caretta	56.7	33.0	M
BP5602 X6111	11/21/95	Chelonia mydas	41.0	8.2	F
BP5603 X6039	11/21/95	Chelonia mydas	35.3	5.7	M
BP5604 X6113	11/21/95	Chelonia mydas	35.3	6.6	F
BP5605 X6114	11/21/95	Chelonia mydas	41.7	9.3	M
BP5606 X6115	12/5/95	Chelonia mydas	36.7	6.3	U
BP5607 X6116	12/5/95	Chelonia mydas	41.5	9.9	F
BP5608 X6117	12/5/95	Chelonia mydas	35.2	5.9	M
BP5609 X6118	12/5/95	Chelonia mydas	40.5	8.9	F
BP5610 X6119	12/5/95	Caretta caretta	58.5	37.0	F
BP5611 X6120	12/5/95	Chelonia mydas	33.9	5.4	F
BP3295 X6037	12/15/95	Chelonia mydas	37.4	7.0	F
BP5617 X6121	12/15/95	Chelonia mydas	52.7	27.0	F
BP5618 X6122	12/15/95	Chelonia mydas	42.0	8.7	F
BP5619 X6123	12/15/95	Chelonia mydas	41.0	9.1	F
BP5620 X6124	12/15/95	Chelonia mydas	33.4	5.0	F
BP5621 X6139	12/15/95	Chelonia mydas	42.2	9.9	M
BP5622 X6125	12/15/95	Chelonia mydas	33.3	4.5	F
BP5623 X6140	12/15/95	Chelonia mydas	32.8	4.6	F

Green turtles		Loggerheads	
14/21 females	66.7%	2/8 females	25.0%
6/21 males	28.6%	4/8 males	50.0%
1/21 undetermined	4.8%	2/8 undetermined	25.0%

Combined results for the entire year of 1995:

Green turtles		Loggerheads	
41/58 females	70.6%	10/19 females	52.0%
14/58 males	24.0%	6/19 males	31.6%
3/58 undetermined	5.0%	3/19 undetermined	15.8%

Table 10. Results of testosterone analysis from samples taken from juvenile green turtles captured over Sabellariid worm reefs, Indian River County, Florida, received between September, 1997 and August, 1998.

Tag Numbers	Date	Species	Carapace Length sl (cm)	Weight (kg)	Sex
BP6689 N7474	6/22/96	Chelonia mydas	30.8	3.5	F
BP6690 N7576	6/24/96	Chelonia mydas	41.6	0.0	M
BP6695 N6295	6/26/96	Chelonia mydas	36.2	6.7	F
BP6691 N6296	8/2/96	Chelonia mydas	39.2	7.8	F
BP6692 N6297	8/2/96	Chelonia mydas	38.9	7.9	F
BP6693 N6298	8/2/96	Chelonia mydas	32.3	4.9	F
BP6694 N6299	8/13/96	Chelonia mydas	50.7	22.0	U
BP6696 N9001	8/13/96	Chelonia mydas	45.6	15.5	M
BP6697 N9002	8/13/96	Chelonia mydas	27.1	3.0	F
BP6676 N9006	8/16/96	Chelonia mydas	29.0	3.4	F
BP6698 N9003	8/16/96	Chelonia mydas	30.9	3.9	F
BP6699 N9004	8/16/96	Chelonia mydas	29.7	3.6	F
BP6700 N9005	8/16/96	Chelonia mydas	40.8	8.7	U

9/13 females	69.2%
2/13 males	15.4%
2/13 undetermined	15.4%

Table 11. Domestic recoveries of subadult loggerheads tagged and released by U.C.F. in the Indian River Lagoon (IRL), Indian River County, Florida, received from September, 1997 through August, 1998.

Tag Numbers	Original Tag Date	Recovery Date	Recovery Location	Condition
BBE005 QQJ020 SWF-Cc9404	6-Jun-95	20-Apr-98	IRL, prop-dead 1/4 mile S Sebastian inlet.	dead

Table 12. Domestic recoveries of juvenile green turtles tagged and released by U.C.F. in the Indian River Lagoon (IRL), Indian River County, Florida, received from September, 1997 through August, 1998.

Tag Numbers	Original Tag Date	Recovery Date	Recovery Location	Condition
BP5675 X6192	22-Feb-96	1-Sep-97	Indian River Co; monofilament on RR.	dead
BP4514	14-Mar-96	24-Aug-98	TAG ONLY; found floating at Wabasso Beach	unknown
BP4564 X4764 BP7239 X6501	15-Mar-96	17-Jun-98	IRL, west side, 4.5 mi N of SR510; prop-killed.	dead
BP7036 X6359	2-May-97	7-Apr-98	IRL, dead on spoil island near Sebastian Inlet	dead

Table 13. Domestic recoveries of juvenile green turtles tagged and released by U.C.F. over nearshore Sabellarid worm reefs, Indian River County, Florida, received from September, 1997 through August, 1998.

Tag Numbers	Original Tag Date	Recovery Date	Recovery Location	Condition
BP6691	8/2/96	6/12/98	TAG ONLY; 1 1/2 mi S of inlet on beach.	unknown
BP7286 P2682	6/5/98	6/19/98	Washed up on Vero Beach.	dead
BP7099	6/30/97	6/30/98	TAG ONLY; 2 mi S of inlet on beach.	unknown

Table 14. Tagging and morphometric data for marine turtles tagged by other researchers and net-captured by U.C.F. in the Indian River Lagoon and nearshore reefs, Indian River County, Florida between September, 1997 and August, 1998.

Tag Numbers	Species	Original Tag Date	Original Tag Location	U.C.F. Recovery Date	Recovery Location	Carapace Length SL (cm)	Wt (kg)
SST862 SST863	Cc	2/16/97	St. Lucie Power Plant	11/26/97	lagoon	63.7	36.0
SSA557 SSA558	Cc	5/5/98	Sea World of Florida	5/5/98	lagoon	76.2	64.0
SSA567 SSA568	Cc	5/5/98	Sea World of Florida	5/5/98	lagoon	49.2	20.0
N5921 BP7304	Cc	8/8/96	Bolten tag/Azores	6/19/98	lagoon	65.6	47.0
SSR021 SSR023	Cc	-	Sea World of Florida	7/23/98	lagoon	56.1	-
BBD246 P2680	Cm	6/23/95	St. Lucie Power Plant	6/5/98	reef	37.0	7.1

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