

SUMMARY OF SEA TURTLE MANAGEMENT

1984

PLAYALINDA BEACH
(KENNEDY SPACE CENTER TO BREVARD/VOLUSIA COUNTY LINE)

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INTRODUCTION

Brevard County, Florida has been identified as the largest loggerhead sea turtle (Caretta caretta), a threatened species, nesting area by the National Marine Fisheries Administration in the United States. Canaveral National Seashore is presently the third largest nesting area in the United States for loggerhead sea turtles. Three other species of sea turtles, which are endangered, (green Chelonia mydas, leatherback Dermochelys coriacea, and hawksbill Eretmochelys imbricata) have also been observed nesting within the Seashore. Over the past years studies have been conducted by the University of Central Florida (UCF), University of Georgia (UG) and the Bionetics Corporation [(contractor of the Kennedy Space Center (KSC))] to determine sea turtle nesting densities within the federally protected lands. These studies have shown that sea turtle nesting densities are approximately 100 nests for every one mile of beach. Canaveral NS averages more than 2,000 sea turtle nests within one year. Additional studies have shown that raccoons (Procyon lotor) are responsible for 90%-98% of nest mortality within the Seashore. During the sea turtle nesting season (May-September), but not exclusively, raccoons stalk the beach in search of newly laid clutches. The sea turtle nest is most vulnerable to predation by raccoons during actual laying of the clutch and the next two weeks following. Predation rate drops considerably after the first two weeks and greatly increases again during the hatching stage prior to emergence (MacMurtry 1983). The hatching stage may begin two weeks before actual emergence.

OBJECTIVES

- 1) TO PROTECT SEA TURTLE NESTS FROM PREDATION BY RACCOONS.
- 2) TO DOCUMENT SEA TURTLE ACTIVITY ALONG PLAYALINDA BEACH.
- 3) RECORD ALL FALSE CRAWLS, NESTS (PREDATED OR NOT), AND HATCHLING EMERGENCE ACCORDING TO LOCATION.
- 4) MONITOR AND MAINTAIN SCREENED NEST TO ENSURE EFFECTIVENESS OF TECHNIQUE.
- 5) RECORD HATCHLING SUCCESS FROM SCREENED NESTS.

FUNDING

Funding was acquired through Special Resource Management Programs (SRP) monies. The total amount of money allotted for 1984 was \$15,000.00. An additional \$5,000.00 was obtained through cyclic monies. A total of \$20,000.00 was allocated for the 1984 Sea Turtle Management Program. See APPENDIX A for budget.

GETTING STARTED

Before any work can be accomplished in regards to endangered or threatened species management proper state and federal permits must be obtained. It is in the interest of the supervisor of the the sea turtle management program to obtain the required permits months before the actual target date of the sea turtle management program.

State permits may be obtained by contacting the following:

Mr. Allen Huff
Bureau of Marine Research
100 8th Ave. SE
St. Petersburg, FL 33701-5095

Federal permits may be obtained by contacting the following:

Mr. Steve Funderburke
U.S. Fish and Wildlife Service Permitting Office
ATLANTA, GA

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It is necessary that all employees participating in the sea turtle management program be badged by the Kennedy Space Center. These employees/seasonals need access to KSC for supplies and access to the beach during pre-lift off procedures of the shuttle. Employees should at all times keep their KSC badge on their persons. All Terrain Cycle (ATC) maintenance and preparation is essential for the employees to operate in an efficient and productive manner. Training on the use and the care of these vehicles is highly recommended. Griding the beach prior to start of the sea turtle management program will speed your operations along. The grid numbers start at Apollo Beach with #1 and terminate at Playalinda Beach #93 (See Figure 1 & 2). Each grid is 1/4 of a mile.

TRAINING---A 2-3 day training session will aide in the working knowledge of the employees. Park resources as well as guest speakers will help employees learn and understand the biology and conservation of sea turtles and the Seashore's management techniques used to impliment the sea turtle management program. Topics of special concern may include (but not limited to): 1)Crawl Identification, 2)Nest Location, 3)Screening Operations, 4)Computer Training, 5) ATC Maintenance, 6)Park Operating Procedures, and 7)Park Objectives.

METHODS

Sea turtle nesting season at Canaveral NS is from May through September of each year. The peak nesting season is in mid-June through early-August. Before the sea turtle management program can be initiated grid locations must be clearly marked along the dune line for reference points (See Figures 1 & 2). During the 1984 program only grids 45-93 were used. These grids represented Playalinda Beach. The north end of the Seashore (grid 45-0) was the study site for sea turtle research being conducted by students from the University of Georgia. The results from this work should be sent to the Seashore in the near future. APPENDIX B shows work of University of Georgia.

Two seasonal employees (turtlers) were hired to conduct the sea turtle management program. The turtlers began their work at 0500

Figure 1

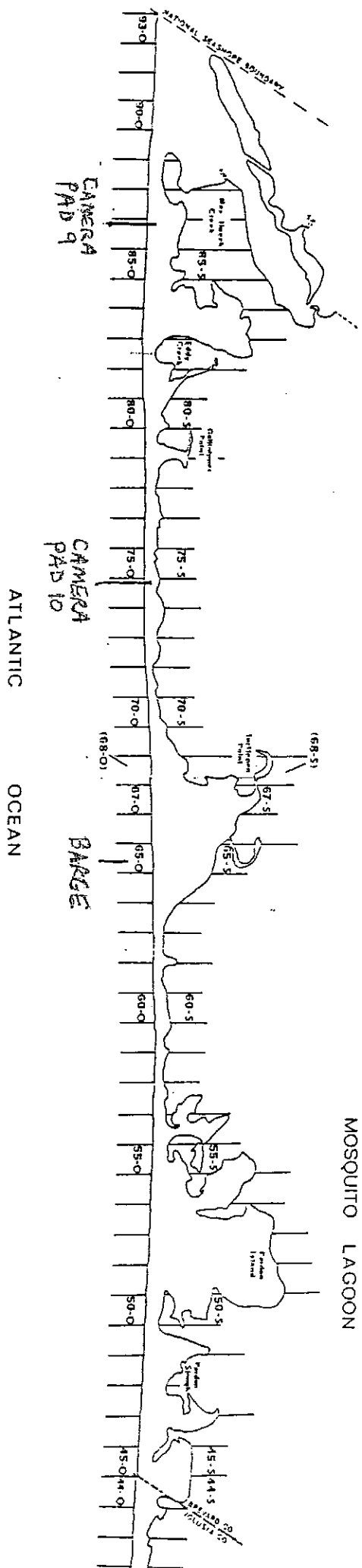
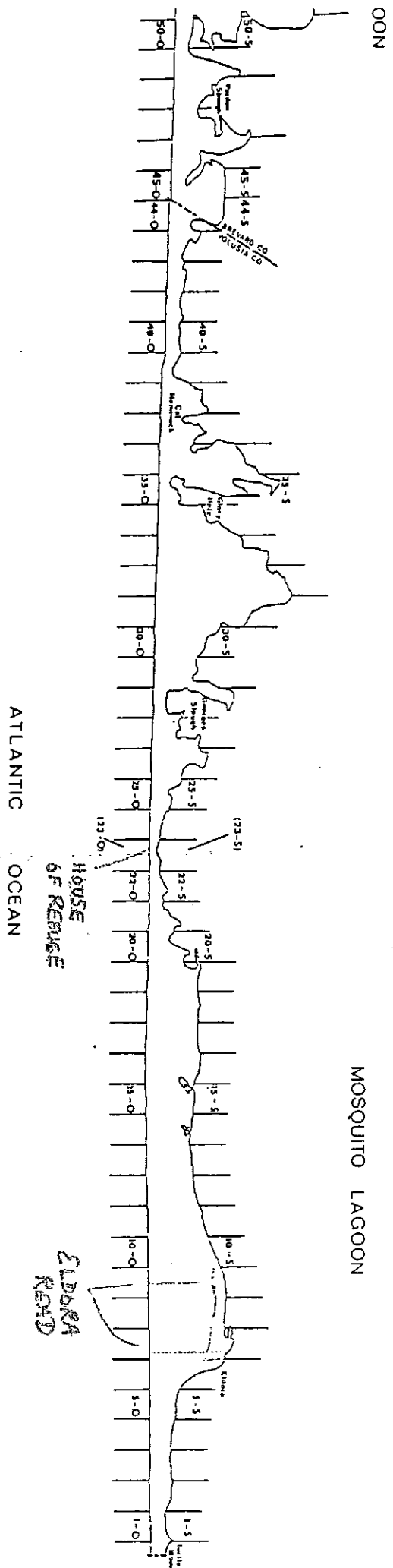


Figure 2



hours at grid #93 and worked their way down to grid #45. Within each grid the turtles recorded all turtle activity on data sheets (See Figure 3). Each observed sea turtle activity was recorded on a separate data sheet. Once the data was recorded then the following management would take place if:

SIGHTING OF TURTLE ACTIVITY IS NEW

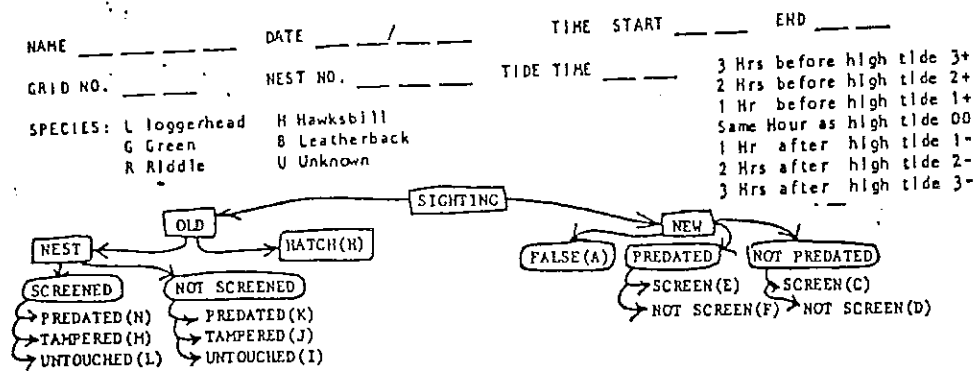
- 1) FALSE CRAWL-----Record species, date, grid #, and erase turtle crawl using ATC.
- 2) FALSE NEST-----Record as if it were a false crawl.
- 3) NEST, but PREDATED----Record species, date, grid #, predator (ie. raccoon, ghost crab, hogs, humans). Remove predated and damaged eggs from the nest cavity. Recover the nest using moist sand (not WET) from the surrounding area. Erase all evidence of nest site and crawl.
- 4) NEST, NOT PREDATED---Record species, date, grid #, screen nest, mark location, and erase all evidence of nest site and crawl.

NOTE: WHEN ERASING EVIDENCE OF SEA TURTLE ACTIVITY USING THE ATC DO NOT RUN THE ATC OVER THE NEST.

SCREENING OPERATIONS ARE AS FOLLOWS:

- 1) LOCATE NEST CAVITY--The nest cavity of the loggerhead sea turtle can easily be located. This is not so for the green and leatherback sea turtles since these two species disturb a very large area. Probing can be used to locate nest cavities, this technique is not recommended by the untrained person. Probing may lead to destruction of eggs within the nest cavity. The easiest way to determine the approximate location of the nest cavity is to analyse the movements of the nesting female. Determine which crawl track represents the crawl back to the ocean. Once you have determined this then you are able to decipher an area most likely to house the nest cavity. The nest cavity may be between 6 inches to 1.5 feet below the surface. Once you have located the nest cavity, dig an adjacent hole. From this adjacent hole remove the moist sand from it and replace the sand over the nest cavity. It is important that you do not replace dry or hot sand over the eggs since the sexual development of the embryos is determined by temperature.
- 2) PREPARING THE SITE--After the nest cavity has been recovered, smooth out the surrounding area (at least 4 foot square), but do not remove the top sand. If you remove top sand then the distance between the nest cavity and the screen is short enough for a raccoon to gain access.
- 3) SCREENING--Screens to be used should be pre-cut in 4ft. x 4ft.

Figure 3



sections with a mesh size of 2in. x 4in.. Screening material can be bought in rolls of 4ft. x 100ft.. The 4ft. x 4ft. (with 2in. x 4in. mesh) are large enough to discourage raccoons from tunneling under the screen, and the mesh size is small enough to prevent raccoons from digging down into the nest cavity. The mesh size is also large enough to permit the hatchling to leave the nest cavity. The screens are secured by hammering four 2.5ft. #3 rebar onto the corners. Tie a piece of flagging tape in the center of the screen. On the tape with indelible ink write the nest number.

Once the screen has been secured it is important to place a thin layer of sand over the screen for aesthetic purposes. This will also prevent people from observing the screen and tampering with it. Finally erase all evidence of the crawl.

4) MARKING THE NEST LOCATION—Once the screening process has taken place a marker must be placed along the dune line so that the nest can be located at a later date. A wooden stake (3ft. long 1in. x 2in.) can be used. The following information should be written on the stake; date, species, grid #, nest #, and the distance of the nest cavity from the stake. A piece of flagging tape should be tied around the stake so that it is easier to locate when traveling along the beach.

SIGHTING OF TURTLE ACTIVITY WAS OLD

1) NEST, SCREENED—Record screen #, date, species, grid #, and then determine if nest was predated, tampered with, or untouched. Do any maintenance necessary before leaving the sight.

2) NEST, UNSCREENED—Record as if you were checking a screened nest.

3) NEST, HATCHED—DO NOT ASSUME THAT THE ENTIRE CLUTCH HAS EMERGED. Some nests have a double emergence. Record species, grid #, nest #, and date. If a clutch has hatched then a small opening will appear around the center of the screened area and one to several tracks will appear coming from the opening.

Daily surveys are important to the sea turtle management program. During these surveys a close watch can be kept over the screened nests for maintenance purposes and for hatchling emergence. Do not expect the hatchling to emerge before 60 days of incubation. Sixty days is the average incubation period.

EXCAVATING NESTS

Although the incubation period for sea turtle eggs is at an average of 60 days it is recommended that the nests not be excavated until the 70th day of incubation.

EXCAVATING THE NEST—Remove the screen and locate the nest cavity. Separate the hatched eggs from the unhatched. Record the data and then

Figure 1

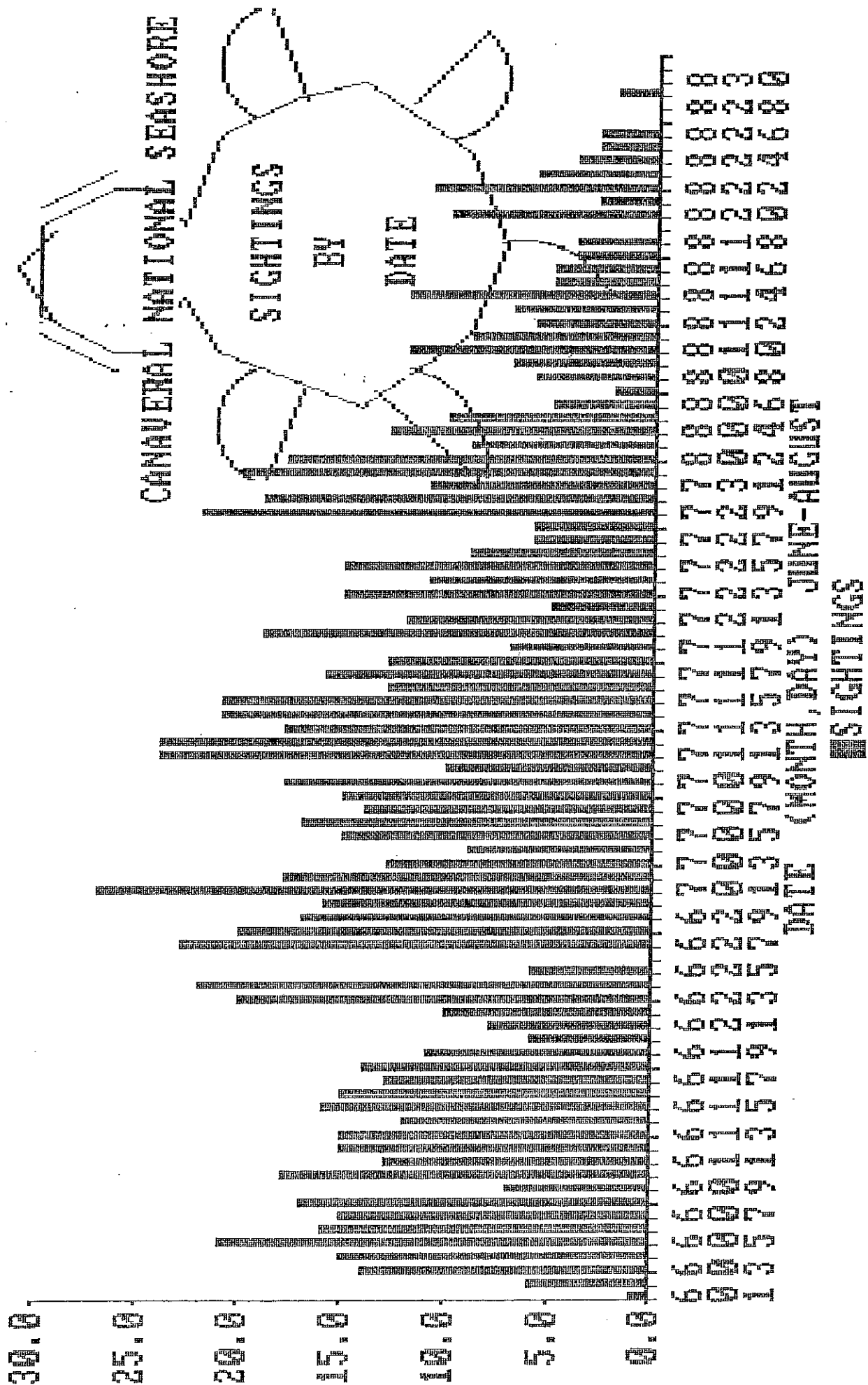
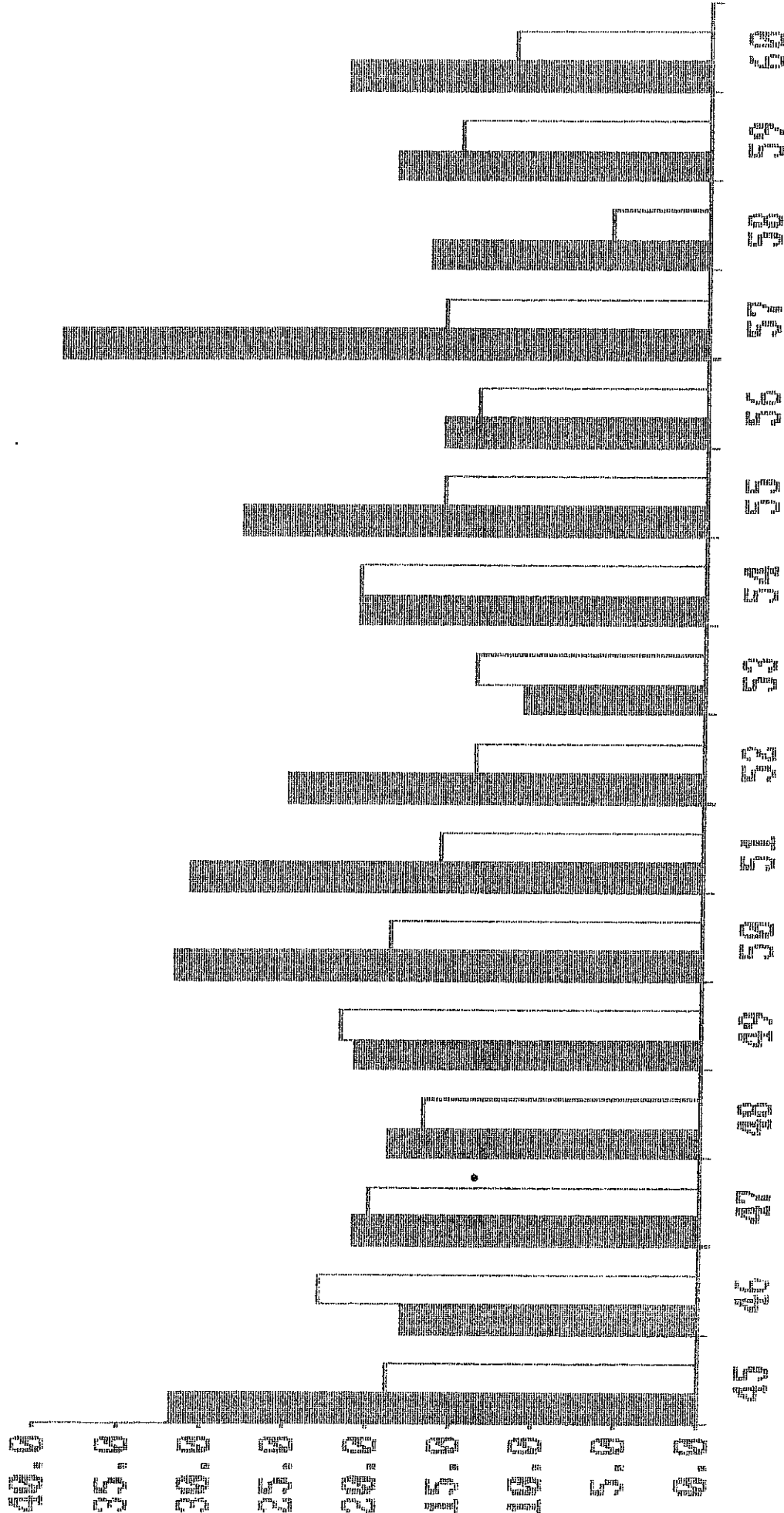


Figure 5

Figure 5



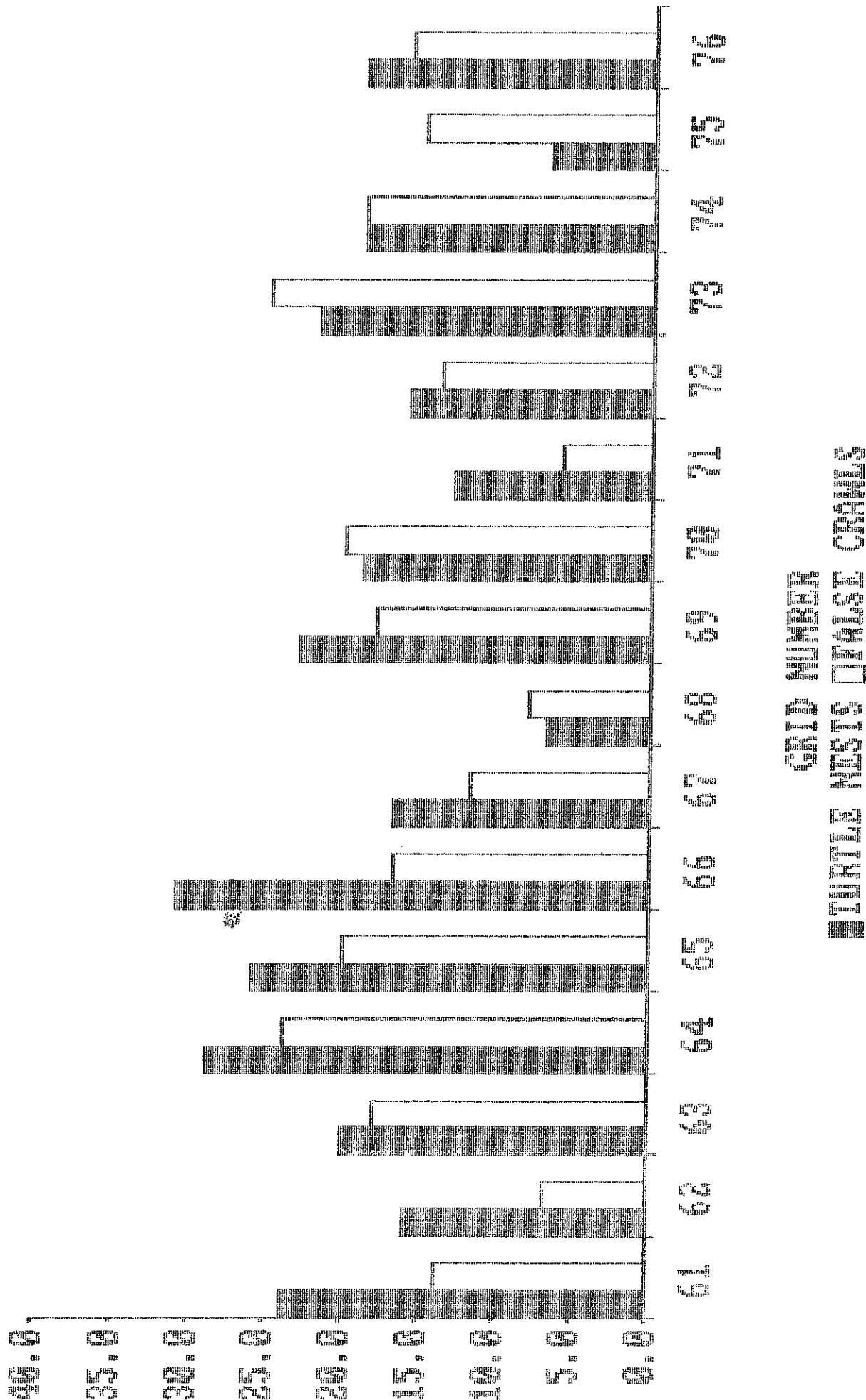
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FIGURE 5
 U.S. AIR FORCE
 AIRCRAFT

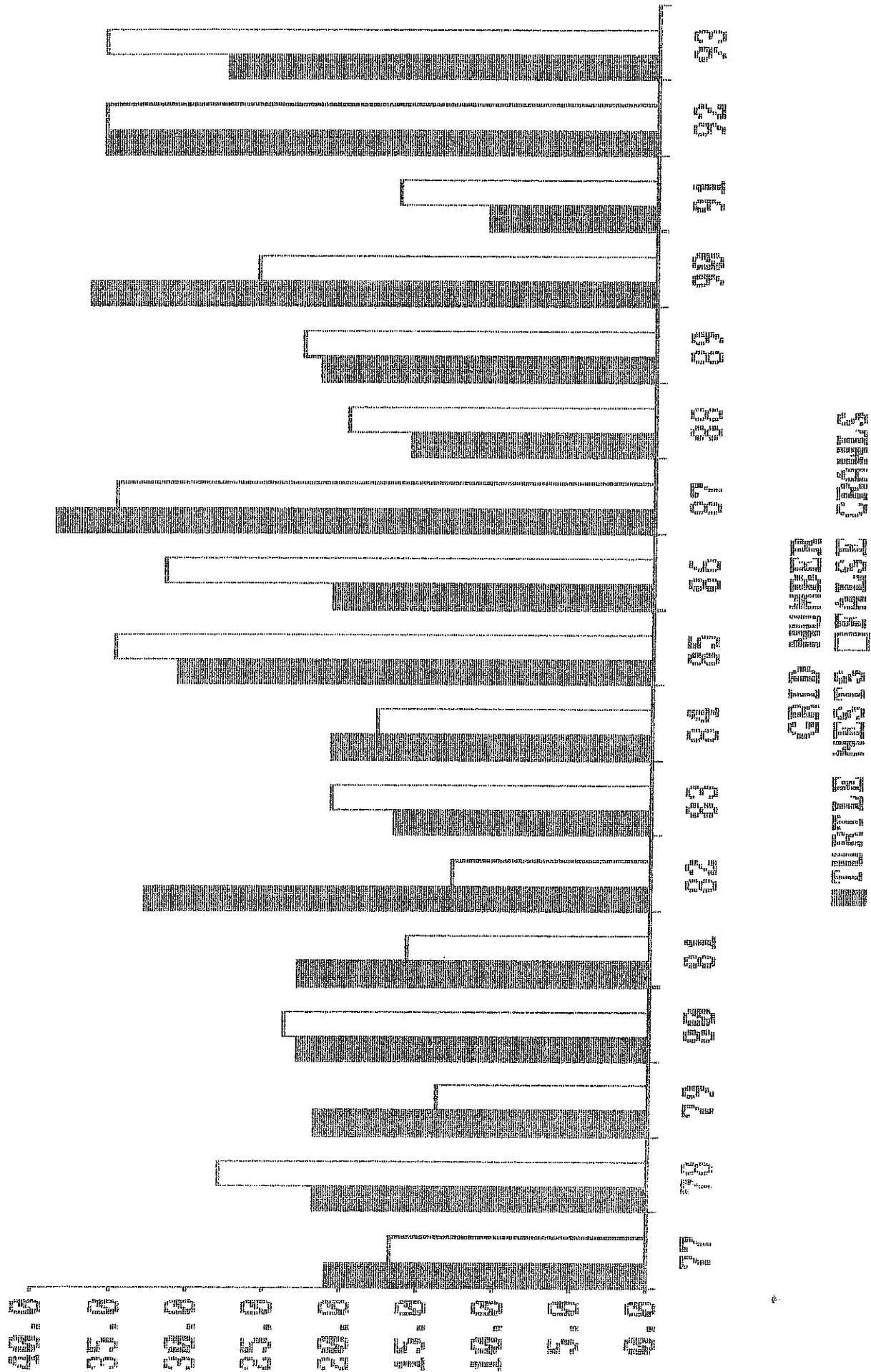
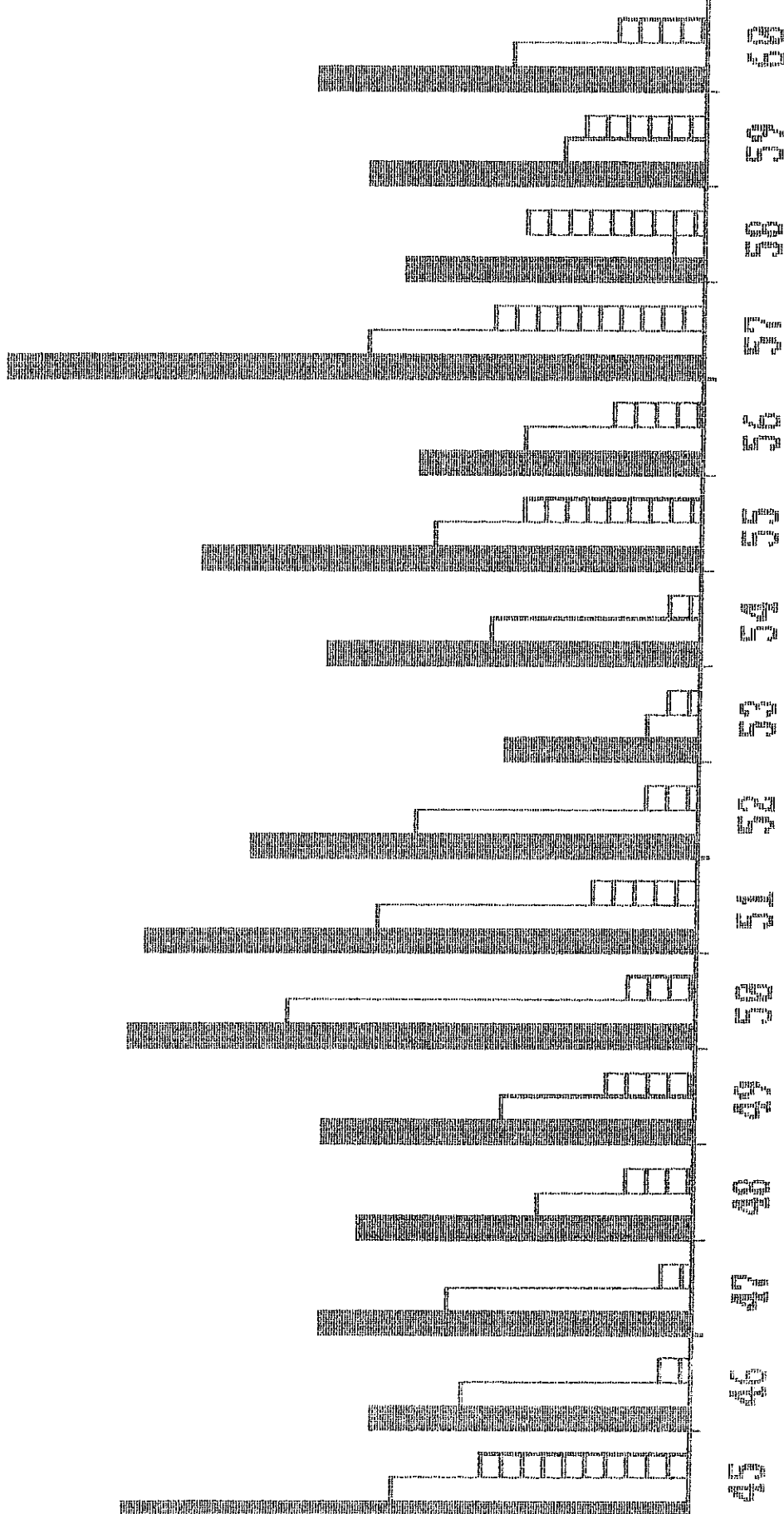


Figure 6

RESEARCH

1970 1971 1972 1973 1974 1975 1976 1977 1978



RESEARCH

Figure 6

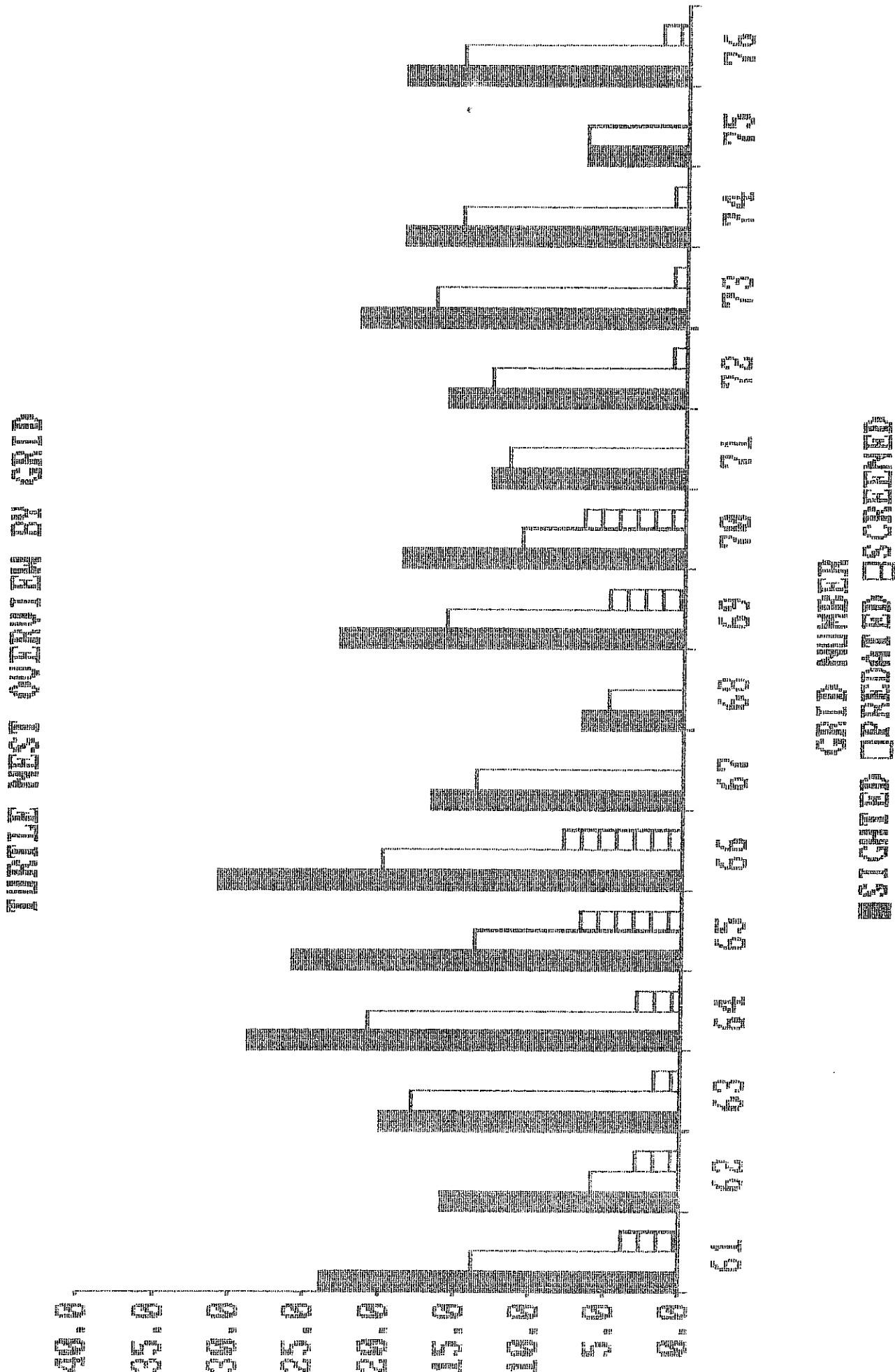
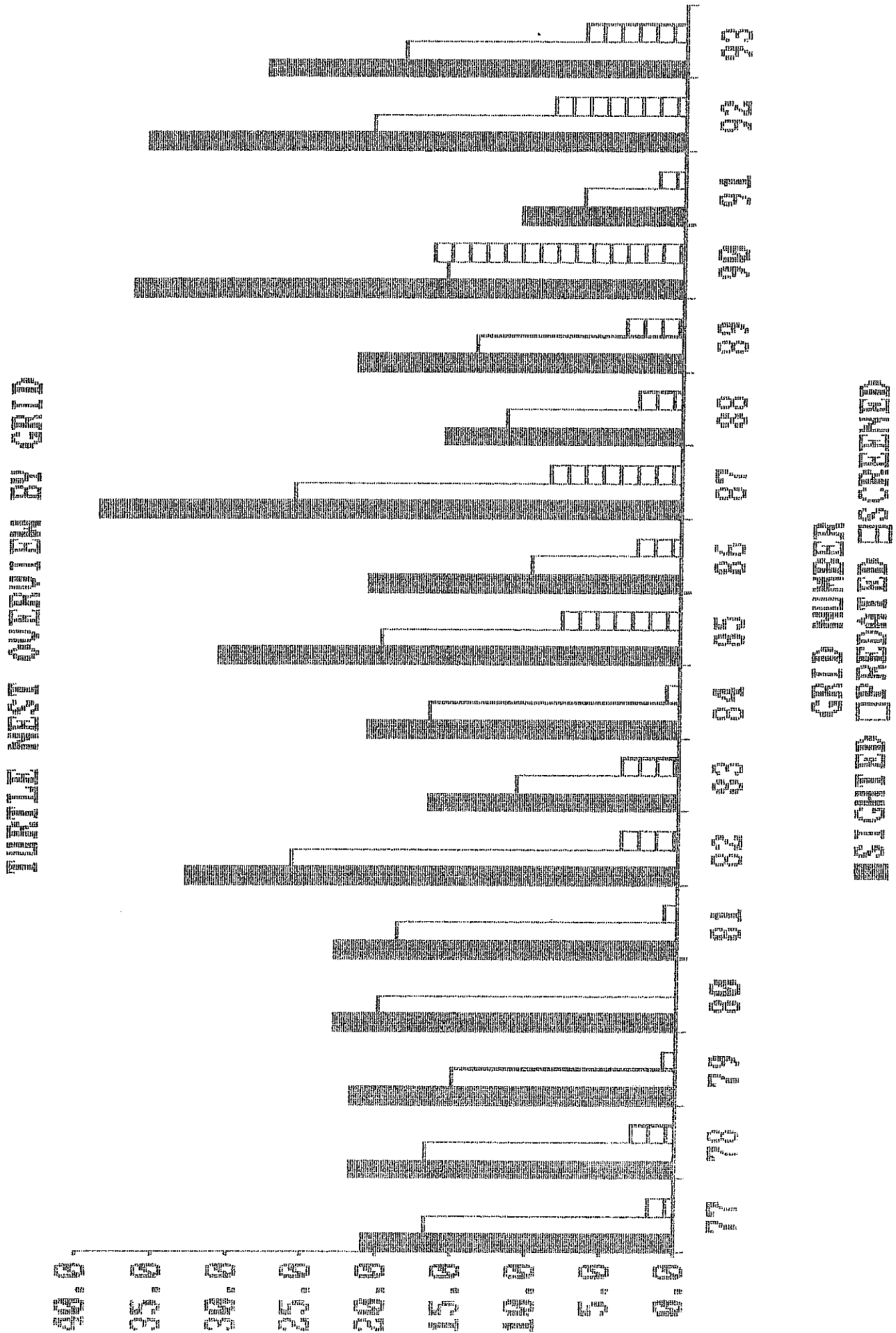


Figure 6



determine a hatchling success rate for the nest. At the end of the season determine a hatchling success rate by dividing the total number of eggs hatched by the total number of eggs laid. The total number of eggs should be from all of the screened nests.

Once the excavating was completed the hole was recovered and the stake, screen, and rebar were returned to the supply area.

All daily field data was brought to Headquarters and entered into the Seashore's IBM PC. The data was entered either by the turtlers or the computer technician. The computer technician supplied the turtlers and program coordinator with weekly status reports and graphical information for program analysis.

After each days activities the ATCs were washed off, fueled and run through a daily general maintenance look-over (ie. oil levels, tire air pressure). Once the ATCs were serviced then materials for the next days activities were prepared and loaded onto the ATCs.

RESULTS AND DISCUSSION

The sea turtle management program began on May 13 and ended on August 30, 1984. The program involved surveying the beach seven days a week for sea turtle activity and the protection of sea turtle nests from raccoon predation. The two seasonal technicians (turtlers) worked five days a week and the other two days were worked by either permanent park personnel or VIP's. Actual screening operations began on June 7 and ended on August 18. Screening operations didn't begin until June 7 because the turtlers had to be trained in Basic Fire Fighting and the sea turtle management program. The beginning and ending date for screening operation corresponds with the most active sea turtle nesting within the Seashore (Figure 4). The gaps in the data (6/26, 8/19) were days in which the survey was not conducted due to a personnel shortage. The gaps towards the end of August were not caused by personnel shortage, but that no sea turtle activity was noted along Playalinda Beach.

The total number of nests laid on Playalinda Beach was 1120. Loggerhead sea turtles accounted for 1101 of these nests while green sea turtles accounted for 19 of the nests. The number of nests predated by raccoons was 728. The predation rate for 1984 was 64%.

65

Previously the predation rate was anywhere from 95%-98%.

Nineteen percent of the sea turtle nests were screened for protection from raccoon predation. This gave a total of 213 screened nests for Playalinda Beach. Of the 213 screened nests only four of those were predated by raccoons. The raccoons were able to tunnel under three of the screens while the fourth screen was placed three feet away from the nest cavity permitting the raccoons to dig directly into the nest cavity. The percent of nests screened per actual screening days was 32%.

Seventeen percent of the sea turtle nests were unaccounted for. These nest were not predated upon observation. The reason why they were not screened was due to the lack of personnel to accomplish the screening program and conduct the survey and the lack of materials. Since the unpredated sea turtle nests were not marked it is difficult to determine whether or not that the nests were predated at a later date. Data supported by the turtlers show the screened nests were tampered with by raccoons days later. However, hatchlings and hatchling crawls were observed from nests that were unmarked. The unaccountable 17% may not have been a total lost to raccoon predation.

The total numbers of sea turtle nests versus false crawls is found in Figure 5. The ratio of nests to false crawls is 1 to 1.2 This data corresponds with other studies carried out by the University of Georgia.

Figure 6 shows the sea turtle nest overview for the sea turtle management program. From this graph it appears that the most active nesting area along Playalinda Beach 1984 was between grids 45-52, 63-66, and 76-93. Grids 76-91 are the primary use area for visitors to the Seashore. Ninety-four percent of the 49 grids had at least 50% sea turtle nest predation by raccoons.

RECOMMENDATIONS

- 1) Coordinator be familiar with the sea turtle management plan and establish objectives.
- 2) Stop all screening operations 60 days prior to storm season (Storm season begins after the 2nd week in August usually).
- 3) Working hours for the sea turtle management program should begin at midnight and conclude at 0800 hours.

BENEFITS

- A) Daily prime nesting time.
- B) Intercept raccoon predation thus increase protection of the resource.
- C) Positively identify nesting species.
- D) Check for tags on nesting turtles and keep personal logs to determine # of

PROBLEMS

- A) Safety--would need additional training and/or 4-wheel ATCs.
- B) Lights may cause more false crawls.
- C) Insects are a nuisance.
- D) Idle time waiting for species to crawl and turtlers would have to comb the beach several times per evening.

- times and location of individual nests.
E) ATCs available for other purposes (ie. Law Enforcement)

4) Working hours for the sea turtle management program should be from midnight to 0800 hours from late June through the first two weeks in August. Working hours prior to those dates and following those dates should be from 0500 hours through 1300 hours.

BENEFITS

PROBLEMS

- | | |
|--|---------------------------------------|
| A) Daily prime nesting time correlates with prime nesting season.
B) Midnight to 0800 hours extended into August because green sea turtles are more abundant.
C) Intercept raccoons during prime nesting season. | A) Same problems as recommendation 1. |
|--|---------------------------------------|
- 5) Extend sea turtle management program from 2 turtlers to 6 turtlers.

BENEFITS

PROBLEMS

- | | |
|---|-------------|
| A) Work a seven day week
B) Work the entire Seashore
C) Flexibility | A) Monetary |
|---|-------------|