Ecological Assessment and Monitoring of Hard-bottom Communities in No-take Zones of the Florida Keys National Marine Sanctuary

Level II Zone Monitoring Program

1999 Data Summary: Quicklook Report

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ABSTRACT

The Florida Keys National Marine Sanctuary (FKNMS) was designated and signed into law in 1990 to protect the unique marine ecosystem of the Florida Keys. After a six year planning process with extensive public comment, the Final Management Plan (Preferred Alternative III) was accepted, providing ten action plans to minimize human impacts and facilitate diverse uses of Sanctuary resources. One of the more controversial issues in the Management Plan was the zoning action plan, designed to protect unique biological features such as well-developed bank reefs, provide experimental sites for evaluating human impacts such as fishing, and separating conflicting resource uses. In addition to the existing management areas administered by the Sanctuaries and Reserves Division of NOAA, the State of Florida and the U.S. Fish and Wildlife Service, 23 no-take zones were established in the FKNMS and demarcated by July 1997. Of the 23 zones, 18 are designated as Sanctuary Preservation Areas (SPAs), one ecological reserve in the Western Sambos, and four, special-use zones (Research Only Areas). Together the three types of zones comprise 49.2 km^2 or 0.5% of the FKNMS.

Scientists from the National Undersea Research Center/University of North Carolina at Wilmington (NURC/UNCW) initiated rapid, large-scale sampling in 1998 and continuing in 1999 in the majority of SPAs, Research Only Areas and the Ecological Reserve. This evaluation comprises part of the Level II Zone Monitoring Program in the FKNMS, whose main goals are to evaluate the second-order effects of fishing on marine hard-bottom communities, facilitate the Sanctuary's evaluation of zone performance, and coordinate analyses of benthic habitat data with targeted species assessments, especially reef fishes. This report summarizes preliminary findings from surveys conducted during August to December 1999, by providing an overview of the methodologies employed and results obtained.

Using the modified benthic habitat map of the FKNMS, a two-stage, stratified random sampling program was used to sample sites throughout the Florida Keys reef tract and some patch reef areas. With the exception of seven SPAs, all no-take zones were included in the 1999 sampling, together with their corresponding reference areas. A total of 80 sites, represented by 34 survey areas in no-take zones and 46 in reference areas, were sampled from southwest of Key West to northern Key Largo (184 km) during August to December 1999 (39 field days). Hard-bottom types surveyed were represented by low-relief spur and groove, deeper low-relief hard-bottom and fore reef terrace communities at 25-35 feet (8-11 m depth); high-relief spur and groove and shallower low-relief hard-bottom at 10-25 feet (3-8 m depth); offshore patch reefs in the lower Keys near Looe Key; and high-relief spur and groove located on the inner reef line from Grecian Rocks to North-North Dry Rocks. Several methods were used in 1999 that incorporated a suite of variables for characterizing the status of benthic communities (coverage, other abundance measures) and process-related phenomena (recruitment). Within each survey site (represented by pre-designated 250-m x 150-m blocks), a differential global positioning receiver was used to locate four, pre-selected randomized points. Four random survey points were sampled in each site, for a total of 320 survey points during 1999. Four transects were surveyed for benthic coverage in each site; eight transects were surveyed for species richness, benthic cnidarian abundance, urchin abundance and size, and spiny lobster abundance; and two transects were sampled for octocoral abundance, juvenile coral abundance and size, and coral size and condition. Preliminary summary statistics are presented for each of these variables.

INTRODUCTION

The focus of the NURC/UNCW program is the Level II zone monitoring (Table 1), designed to be both a rapid assessment and monitoring effort aimed at evaluating ecosystem structure and use in the most heavily used no-take zones in the Florida Keys National Marine Sanctuary (Figure 1). Included in the sampling regime are most of the Sanctuary Preservation Areas (SPAs), all Research Only Areas, and the Western Sambos Ecological Reserve. The emphasis of the NURC/UNCW effort is to assess and monitor benthic community composition and reef coral condition in no-take zones and reference habitats of the FKNMS. The guiding research and management questions of the project entail evaluations of multiple spatial scales and temporal trends:

- Are there significant differences in benthic community structure and composition between no-take zones and corresponding reference habitat types within the three regional sectors (lower, middle and upper) of the Florida Keys?
- Are there significant differences in benthic community structure and composition among similar habitat types throughout the Florida Keys?
- Are the patterns of change (rate, magnitude, and direction) in benthic community structure different between no-take zones and reference areas?
- Are the patterns of change in benthic community structure different among regional sectors of the Florida Keys?

This project also aims to complement targeted species assessments, especially reef fishes, carried out by several private and public organizations, while also providing assessment and monitoring information on the possible second-order effects of fishing. This is facilitated by comparing the no-take zones with corresponding reference areas, to determine differences in the status of different organisms, but also the pattern (rate and magnitude) of change. The underlying goal of this project is to determine the efficacy of the zones in the FKNMS management strategy. There is an obvious need to determine the status (abundance and condition) of organisms and communities within the no-take zones, what patterns of variation are apparent, and the potential causative mechanisms influencing those patterns. There is also an urgency to collect, assimilate, and report the zone monitoring information in a timely manner. Although "rapid" is a relative term, this project is designed to survey, analyze, and report information on the zones within weeks to months of field work completion. This program makes use of relatively inexpensive survey equipment and minimal personnel, but efficient use of underwater bottom time and a suite of variables measured and methods employed.

SAMPLING DESIGN

The modified sampling approach employed during 1999 was designed to explore multiple spatial scales of protection and environmental setting in the FKNMS. Investigating multiple spatial scales is viewed as increasingly important for providing a frame of reference to smaller-scale ecological experiments and insights into regional phenomena (Chiappone and Sullivan 1997, Hughes et al. 1999). The NURC/UNCW rapid assessment and monitoring program makes use of independent sampling of randomized points within particular habitat types. Independent sampling over time (i.e. random transects as opposed to fixed station monitoring) makes it more challenging to detect temporal changes, since the sampling design needs to take into consideration the inherent spatial variability in tropical hard-bottom communities. That is, if random samples are taken during each

visit, the sampling effort needs to be sufficient to ensure that spatial variability does not mask temporal variability (McClanahan 1997). The advantages of using random samples, however, are that conclusions are not bound to the particular histories of individual organisms and the particular areas of reef framework sampled. This is often a criticism leveled at most reef monitoring studies, in that there may be concerns about whether permanent monitoring stations are representative of the general reef area, but also whether patterns of change are indicative of ecosystem-wide variations. An independent/factorial approach to coral reef monitoring gives increased confidence in the signals detected, but less statistical power to detect those signals (Aronson et al. 1994).

Significant modifications were made to NURC/UNCW sampling design used in 1998 in order to address the hypotheses in 1999. Among the major issues considered was pseudoreplication, reducing potential site bias, including more reference sites, and measuring a greater suite of variables. The 1999 field effort made use of survey blocks (150-m x 250-m) randomly selected and stratified by depth range and habitat type using the FKNMS habitat map. Random sampling points were selected within each survey block for no-take zones and reference habitats. This design has the effect of essentially "spreading out" the sampling effort and avoiding pseudoreplication by randomly selecting survey points. This approach also allows a greater area to be sampled (i.e. representation) and can better account for inter-site variability. The second major change to the sampling design was the inclusion of more reference areas for comparison to the no-take zones. Using the existing habitat map for the FKNMS and targeting specific depth ranges, reference areas between the zones were selected to encompass similar community types. Because of modifications made to the sampling intensity in any given site or survey block, more effort was given to sampling a greater number of reference areas. The 1999 field effort incorporated several variables to characterize community structure and condition beyond those measured in 1998:

- larger area for coral size and condition measurements,
- species richness of sponges and octocorals, in addition to stony corals,
- species composition and abundance of octocorals,
- *in situ* measurements of juvenile coral abundance and size, and
- abundance and size of other selected invertebrates (anemones, corallimorpharians, urchins and spiny lobster).

These measurements are designed to give a comprehensive view of community structure and explore spatial and temporal variability in process-related phenomena such as recruitment and herbivory potential (McClanahan 1997).

For the 1999 surveys, a two-stage sampling design-based approach was developed to estimate population parameters of benthic community composition and structure of hard-bottom and coral reef habitats. The sampling design incorporated defined sampling blocks stratified by habitat type in the FKNMS. Multiple random samples were taken within a defined "block" area. Each block was treated as a "site" and had a defined number of independent samples that were optimized for sampling efficiency and funding effort available. The habitat types targeted were determined by the hard-bottom and reef types encompassed by the no-take zones in each regional sector (upper, middle and lower Keys) within a defined depth range (FDEP 1998). Previous data from the Florida Keys and 1999 data from the Dry Tortugas were used to optimize sampling effort for each of the variables measured.

The 1999 field effort targeted reef and hard-bottom areas from Western Dry Rocks, southwest of Key West, to northern Key Largo (Figure 2). Using Geographic Information Systems and the revised Benthic Habitat Map for the Florida Keys (FDEP 1998), each habitat type, at a specific depth range, has a defined area, allowing the number of random blocks relative to the habitat area available to be optimized. The habitat strata used for the 1999 sampling are shown in Table 2. The sample block size (250-m x 150-m) was determined through preliminary data collected in conjunction with fisheries-independent fish censuses in the Dry Tortugas during June 1999. The habitat map of the FKNMS was divided into 11,200 sub-units that are 1 km^2 cells (G. Meester, RSMAS-UM, personal communication). Each sub-unit area is characterized by the different hard-bottom and coral reef types specified in FDEP (1998). The total area of each hard-bottom and coral reef type determined the total number of samples, which were allocated proportionally within each strata and area. Within each sub-unit, locations of sampling blocks (out of 24 possible locations) were randomized. Stations or sampling points within each survey block were then randomly selected. The sampling effort to address our hypotheses was optimized for the different variables as shown in Table 3. Several methods are used as part of the rapid assessment strategy and are described in further detail in Miller et al. (2000). The individual survey blocks sampled in 1999 are listed in Table 4 and illustrated in Figures 3 to 5.

PRELIMINARY RESULTS

Although the NURC/UNCW Program will continue with formal statistical analyses using sampling survey statistics in the near future, we have included preliminary findings from the 1999 field survey effort. These summaries are meant to provide a "quick look" evaluation and should thus be interpreted with caution. Accompanying tables and graphics provide summary densities and frequencies for the various variables measured.

Sampling and diving effort

Eighty survey sites were sampled from August to December 1999. Thirty-nine days of underwater work were needed to complete all of the targeted sites (Table 4). Sites were distributed from Western Dry Rocks (24 26.707'N, 81 55.693'W), southwest of Key West, to north of Carysfort Reef (25 14.901'N, 80 11.703'W), a distance of over 110 nautical miles. Hard-bottom types surveyed were represented by:

- Low-relief spur and groove, deeper low-relief hard-bottom and fore reef terrace communities at 25-35 feet (8-11 m depth;
- High-relief spur and groove and shallower low-relief hard-bottom at 10-25 feet (3-8 m depth);
- Offshore patch reefs in the lower Keys within and near the Looe Key Research Only Area; and
- High-relief spur and groove located on the inner reef line from Grecian Rocks to North-North Dry Rocks in the upper Florida Keys

The 80 sites sampled in 1999 were distributed among no-take zones and reference habitats within each regional sector as follows:

- In the lower Keys, 10 sites were located in no-take zones and 13 in reference areas. Of these, four sites were sampled in offshore patch reefs, four sites in high-relief spur and groove or shallower low-relief hard-bottom and 15 sites in low-relief spur and groove.

- In the middle Keys, 14 sites were surveyed in no-take zones and 20 in reference areas. Of the total middle Keys sites, two were surveyed in high-relief spur and groove (3-8 m depth), while the remaining 32 sites were in shallower (3-8 m) or deeper (8-11 m) low-relief hard-bottom, low-relief spur and groove, and relict reef flats.
- In the upper Keys, 10 sites were surveyed in no-take zones and 13 in reference areas. Of these, eight sites were in high-relief spur and groove (inner and offshore reef tracts) and shallower hard-bottom (3-8 m), and 15 sites in low-relief spur and groove, deeper low-relief hard-bottom, and fore reef terrace/buttress communities (8-11 m).

The field effort demanded the use of SCUBA (air and 36% Nitrox when available) to conduct surveys. A typical survey day consisted of four dives in two survey blocks. Surveys were conducted by a core team of 3-4 divers, with each member responsible for the following tasks:

- Mark Chiappone: species richness, octocoral abundance, juvenile coral abundance and size, benthic cnidarian abundance, urchin abundance and size, and site descriptions;
- Susanna Holst: linear point-intercept and video surveys;
- Steven Miller: linear point-intercept and video surveys;
- Dione Swanson: coral size and condition, video surveys and site descriptions; and
- Allison White: video surveys.

A total of 587 dives encompassing over 15,000 minutes (258.9 hours) of underwater bottom time were needed to complete the field work (Table 5).

Four random survey points were sampled in each site, for a total of 320 survey points during 1999. In each site, four transects were surveyed for benthic coverage, eight transects for species richness, benthic cnidarian abundance and urchin abundance and size, and two transects for octocoral abundance, juvenile coral abundance and size, and coral size and condition (Table 6). Benthic coverage was determined in 318 transects representing 31,800 points. A total of 640 transects, each 10 m^2 in area and totaling 6,400 m^2, were surveyed for the presence of stony coral, octocoral and sponge species. A total of 160 transects, each 10 m^2 in area and totaling 1,600 m^2, were surveyed for octocoral abundance, juvenile coral abundance and size, and stony coral size and condition. Over 5,400 individual coral colonies were measured for size and noted for condition. A total of 640 transects, each 10 m^2 in area and totaling 6,400 m^2, were surveyed for the presence and abundance of other benthic cnidarians (selected anemones, corallimorpharians and colonial zoanthids), the abundance and size of urchins, and the abundance of spiny lobster.

Benthic coverage

A total of 318 transects representing 31,800 points were surveyed for benthic coverage using the linear point-intercept method on four replicate transects per site. Mean percent coverage estimates for total algae, sponges, octocorals, and stony corals are listed in Table 7. Figures 6 to 8 illustrate mean percent coverage (based on four replicate transects) for sites surveyed at 8-12 m depth in the lower, middle and upper Keys. Algae were the dominant benthos in all sites, with mean coverage generally above 75%. At 8-12 m depth, predominant algal functional groups were fine and thick turf algae, brown frondose algae represented by *Dictyota* spp. and *Lobophora variegata*, some green calcareous algae represented mostly by *Halimeda* spp. and crustose coralline algae. Sponge, octocoral, and stony coral coverage were minor in this depth range, with mean coverage for each taxa generally

less than 10%. Where stony corals were most abundant, the predominant species were *Montastraea faveolata*, *M. cavernosa,* and *Siderastrea siderea*. *Acropora cervicornis*, although historically abundant in some mid-depth fore reef areas, was rarely encountered during 1999.

Comparisons of coverage among no-take zones and reference habitats by regional sector are shown in Figure 9. Algal coverage was generally similar among no-take zones and reference habitats, but was more variable in the middle Keys. Sponge cover was greater in zones and reference areas in the middle Keys, and lowest in upper Keys no-take zones. Octocoral coverage exhibited an opposite pattern to sponges. Coral cover was greatest and exhibited more variability among sites in no-take zones of the lower and upper Keys, and was lowest in both middle Keys no-take zones and reference habitats.

Fifteen sites were surveyed in shallower (4-7 m) spur and groove and hard-bottom habitats (Figure 10). Algae were the dominant benthos, with mean percent coverage generally above 75% for the majority of sites sampled. Crustose coralline algae and *Halimeda* spp. comprised a greater percentage of the total algal cover relative to sites at 8-12 m depth. Sponge and octocoral cover was very low (< 10%). Stony coral cover was as high as 25%, but coverage was less than 10% for 12 of the 15 sites surveyed. The greatest coral cover was present in two sites within the Looe Key SPA (shallow fore reef). *Montastraea faveolata*, *M. annularis*, *M. cavernosa*, *Siderastrea siderea*, *Colpophyllia natans*, and *Diploria* spp. represented the majority of coral cover in these areas.

Species richness

Eight transects in each of the 80 sites were surveyed for the occurrence of stony coral, octocoral, and sponge species. A total of 62 sponge taxa (Table 8), 45 stony coral taxa, and 31 octocoral taxa (Table 9) were observed in 1999. Table 10 lists the mean number of species per transect and total species per 80 m^2 area for each site. The total number of species per 80 m^2 for deeper sites (8-12 m) in no-take zones and reference blocks are illustrated in Figures 11 to 13. In general, greater numbers of sponge species were found compared to stony corals and octocorals. Among sites at 8-12 m depth, greater numbers of stony coral species were recorded in no-take zones of all three regional sectors compared to reference habitats, while differences in octocoral species richness were less apparent (Figure 14). Sponge species richness exhibited an opposite pattern to corals, being greater in no-take zones and reference areas of the middle Keys, and lowest in no-take zones in the lower and upper Keys. Species richness patterns among shallower sites in no-take zones and reference habitats (4-7 m) indicated greater numbers of sponge species relative to stony corals and octocorals (Figure 15).

Octocoral abundance

Octocoral abundance and species composition was determined in each site by surveying replicate 25-m x 0.4-m strip transects. A total of 160 transects, each 10 m^2 in area, were surveyed during 1999. A total of 17,821 octocoral colonies were counted in the transects, with a range of 6 to 23 species and 58 to 412 colonies observed in replicate transects among the survey blocks (Table 11). For sites at 8-12 m depth in no-take zones and reference areas, octocoral abundance exhibited high spatial variability (Figure 16). When no-take zones and reference habitats by regional sector were evaluated, octocoral abundance was greater in the upper Keys, particularly in no-take zones (Figure 17). This pattern is indicative of the high density of octocorals at 8-12 m depth particularly within Carysfort/South Carysfort SPA, but also at Molasses and French Reef SPAs. In shallower sites

within no-take zones and reference areas (4-7 m), octocoral abundance was even more spatially variable (Figure 18, top). Octocorals were abundant particularly at two reference sites, Little Grecian and North-North Dry Rocks, where colony density was as high as 450 colonies per 20 m^2 (or 22-23 colonies per m^2).

Juvenile coral abundance and size

A total of 160 transects in 80 survey blocks were surveyed for the species, number and maximum diameter of juvenile stony corals. Ten quadrats measuring 65-cm x 48-cm (0.312 m^2) were surveyed along each transect. Twenty-three taxa were recorded as juveniles throughout the study area (Table 12); this represented just over 50% of the total stony coral taxa found in transect surveys during 1999. A total of 2,084 juvenile corals were recorded in the 1,600 quadrats (mean density of 1.3 juveniles per quadrat). The number of species observed as juveniles ranged from 2 to 15 species among sites, while the number of juveniles ranged from 5 to 75 corals (Table 13).

Among shallower sites at 4-7 m depth within no-take zones and reference areas, total juvenile coral abundance was highly variable (Figure 18, bottom). Except for two of the sites within no-take zones (Sombrero Reef SPA and Elbow Reef SPA), juvenile corals were typically more abundant in reference areas. In deeper sites at 8-12 m depth within no-take zones and reference blocks, juvenile coral abundance was also highly variable (Figure 19). When no-take zones and reference areas were compared by regional sector, there was greater variability in juvenile abundance among middle Keys zones (Figure 20).

Coral size and condition

A total of 160 transects and 5,544 stony corals in the Orders Milleporina (fire corals) and Scleractinia were surveyed for colony size and relative condition among 80 sites during 1999 (Table 14). Of the stony corals measured, 2,322 were *Millepora* spp. (41.9% of total) and 3,223 were scleractinians (58.1%). Condition categories included overgrowth of the colony by various organisms causing visible lesions on live tissue, incidence and severity of tissue bleaching, and incidence and type of disease.

Of the 3,223 scleractinian colonies sampled, there were 381 cases (11.8% incidence) of overgrowth documented, including overgrowth by algae, sponges, octocorals, and the colonial zoanthid *Palythoa mammilosa* (Table 15). Of the 381 cases of overgrowth, nearly 62% were by algae, 30% by sponges, and 6% by octocorals and *P. mammilosa*. The frequency and percent incidence of coral overgrowth by region and management zone are shown in Table 16. The greatest relative frequency of scleractinian coral overgrowth was recorded in the lower Florida Keys, followed by the middle Keys, with the upper Keys having the lowest incidence. Corals in no-take zones generally had similar or slightly greater incidence of coral overgrowth.

From the same sample of 3,223 scleractinian coral colonies surveyed in 1999, there were 1,516 cases (47% incidence) of bleaching-like conditions (Table 17). Six categories were used to characterize the type and severity of tissue bleaching: slightly pale (27.4% of colonies), partially pale (13.4%), pale (42.2%), partially bleached (15.3%), bleached-mottled (1.1%), and bleached (0.6%). Although a relatively high percentage of colonies sampled in 1999 had some type of variability in tissue pigment, less than 20% were bleached at the time of the surveys (August-December). The greatest incidence of bleaching-like conditions were observed in the middle Keys (655 cases from 1,047 colonies or

62.6%) and upper Keys (567 cases from 1,016 colonies or 55.8%). Only 25% of the 1,160 colonies sampled in the lower Keys showed such conditions.

Surveys of corals from 80 sites in 1999 revealed five types of disease condition affecting scleractinian corals: white plague type II, black band, yellow band, dark spot, and dead white skeleton (probably recent white plague). Of the 3,223 scleractinian corals surveyed, only 47 cases of disease (all categories combined) were recorded (Table 18); this represents a disease incidence of 1.5%, irrespective of habitat type or species composition. Of the disease conditions noted, dead white skeleton (38.8%) and dark spot disease (34.7%) were the most common, followed by yellow band (16.3%). Only three cases of active white plague type II and two cases of black band were noted among the 3,223 scleractinian corals sampled. The frequency and percent incidence of scleractinian coral diseases by region and management zone are listed in Table 19.

Benthic cnidarian abundance

A total of 640 transects representing an area of 6,400 m^2 were surveyed for other benthic cnidarians representing anemones and corallimorpharians (Table 20). The following species in the Phylum Cnidaria, Class Anthozoa, Subclass Zoantharia were sampled for abundance:

- *Bartholomea annulata* (ringed anemone, Order Actiniaria, Family Aiptasiidae),
- *Condylactis gigantea* (giant Caribbean anemone, Order Actiniaria, Family Actiniidae),
- *Ricordea florida* (Order Corallimorpharia, Family Corallimorphidae), and
- *Palythoa mammilosa* (knobby zoanthid, Order Zoanthidea, Family Zoanthidae).

These species, with the exception of *P. mammilosa*, were surveyed for abundance in the middle and upper Keys (57 sites), but were only noted as present or absent in the 23 sites sampled in the lower Keys.

Palythoa mammilosa was the most common of the four species targeted, occurring in 76 of the 80 sites (95%), while *Condylactis gigantea* was the least abundant (7 of 80 sites or 8.8%). *Bartholomea annulata* was found in 34 of the 80 survey blocks (42.5%). Of the 68 individuals recorded in the middle and upper Keys, most (46 out of 68 or 68%) were found in the upper Keys, despite a greater number of sites sampled in the middle Keys. *B. annulata* was distributed among the no-take zones and reference areas in the middle and upper Keys as shown in Table 21.

Ricordea florida was found in 44 of the 80 sites (55%). A total of 163 individuals were recorded from 57 sites in the middle and upper Keys. Only 18 individuals were found in 34 sites in the middle Keys, while 145 individuals were found in 23 sites in the upper Keys. *R. florida* was distributed among the no-take zones and reference areas in the middle and upper Keys as shown in Table 22.

Spiny lobster abundance

A total of 640 transects representing an area of 6,400 m^2 were surveyed for the abundance of spiny lobster (*Panulirus argus*). Of the 640 transects sampled, only 15 individuals were found (Table 20). No lobster were recorded within any lower Keys transects, only three in the middle Keys, and the remaining individuals in the upper Keys transects. Nine of the 15 individuals were found in no-take zones, with six of these in shallower (4-7 m), high-relief spur and groove habitats.

Urchin abundance and size

A total of 640 transects representing 6,400 m^2 were surveyed at 80 sites for urchin abundance and size. Three urchin species were recorded during the 1999 surveys: *Diadema antillarum*, *Echinometra viridis,* and *Eucidaris tribuloides* (Table 23). A total of 56 urchins were found in the 640 transects, representing a mean density of 0.09 urchins per 10 m^2 (or 0.009 urchins per m^2). *E. tribuloides* was the most abundant urchin (38 individuals), representing nearly 68% of all individuals, and was found in 25 of the 80 sites (31%) surveyed. *Diadema* was only recorded in 11 of the 80 sites (13.8%) surveyed. Of the 56 urchins recorded, only one *Diadema* was larger than 3.5 cm test diameter (TD). The remaining 55 individuals of all three species were juveniles with test diameters between 0.5 cm and 3.5 cm. Urchins were distributed among the no-take zones and reference areas as shown in Table 24.

SUMMARY AND FUTURE GOALS

This report was designed to provide a sampling synopsis and preliminary data summary from large-scale surveys of no-take zones and reference areas in the FKNMS during 1999. Major findings of the 1999 field effort were:

- Eighty sites distributed in 16 of the 23 no-take zones, with 46 sites in corresponding reference habitats, were surveyed from southwest of Key West to northern Key Largo.
- Survey sites were stratified by depth and habitat type within the lower, middle, and upper Keys regional sectors. Shallower sites at 4-7 m depth were represented by offshore patch reef, high-relief spur and groove, hard-bottom and relict reef flat communities, while sites at 8-12 m depth were represented by low-relief spur and groove and hard-bottom.
- A suite of methodologies were used and variables measured to rapidly and synoptically sample benthic community structure. Variables measured during 1999 were benthic coverage, species richness of sponges and benthic cnidarians, octocoral abundance, juvenile coral abundance and size, stony coral size and relative condition, and abundance and size of targeted invertebrates such as spiny lobster, urchins, anemones, and corallimorpharians.
- Algae were the dominant benthos in both depth strata sampled, with mean coverage generally above 75%. No-take zones in the lower and upper Keys sectors tended to have greater coral cover than reference areas at 8-12 m depth. Sponge coverage was generally greater in middle Keys no-take zones and reference areas.
- Species richness of stony corals at 8-12 m depth was generally greater in no-take zones, particularly in the lower and upper Keys. Sponge species richness exhibited an opposite pattern to stony corals, with the greatest number of species in middle Keys no-take zones and reference areas. Generally similar patterns were evident in shallower sites at 4-7 m depth.
- Octocoral and juvenile coral abundance were highly variable between no-take zones and reference habitats, as well as among regional sectors.
- Selected invertebrates (anemones, corallimorpharians and spiny lobster) were generally more abundant in the upper Keys, particularly in reference habitats in both depth strata.
- Urchins were very low in abundance, particularly *Diadema antillarum*. Size-distribution data indicated a prevalence of recent recruits.

- No-take zones encompass most of the better developed (i.e. higher relief and greater coral cover) in the FKNMS. Corresponding reference habitats, particularly at 4-7 m depth in the middle and upper Keys, exhibit lower topographic complexity and coral cover.

In the next six months, the NURC/UNCW Level II Monitoring Program will focus on several major tasks:

- Statistical analysis and preparation of manuscripts;
- Power analysis and revision of the 2000 sampling as necessary;
- Coordination of benthic habitat and reef fish analyses; and
- Development and coordination of modeling and experimentation efforts to evaluate causal relationships between benthic community structure, fishing and environmental factors affecting the Sanctuary's resources.

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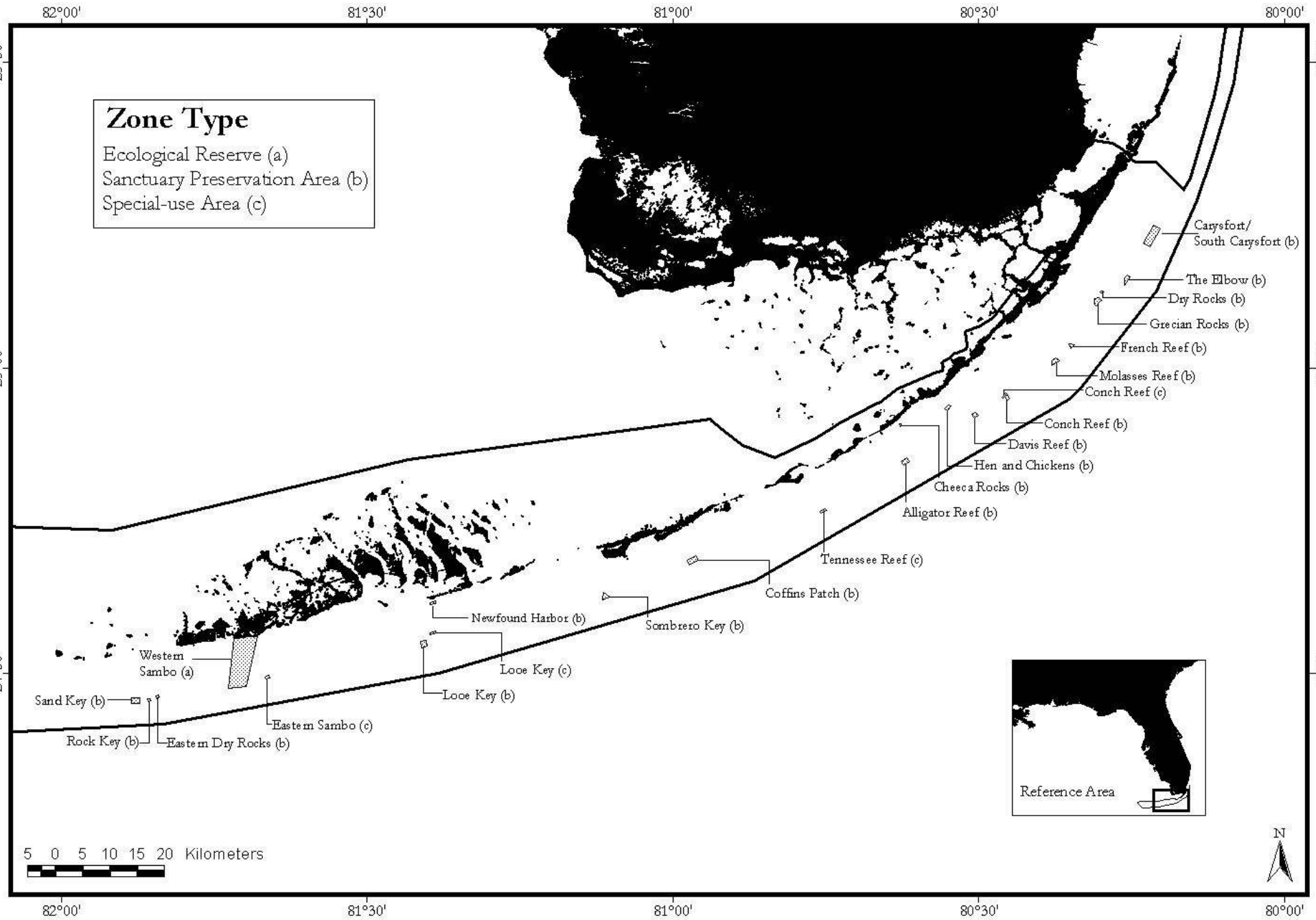
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81°30'
81°00'
80°30'
80°00'
25°30'
25°00'
24°30'
Zone Type
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Sanctuary Preservation Area (b)
Special-use Area (c)
Carysfort/
South Carysfort (b)
The Elbow (b)
Dry Rocks (b)
Grecian Rocks (b)
French Reef (b)
Molasses Reef (b)
Conch Reef (c)
Conch Reef (b)
Davis Reef (b)
Hen and Chickens (b)
Cheeca Rocks (b)
Alligator Reef (b)
Tennessee Reef (c)
Coffins Patch (b)
Sombrero Key (b)
Newfound Harbor (b)
Looe Key (c)
Looe Key (b)
Western
Sambo (a)
Sand Key (b)
Rock Key (b)
Eastern Dry Rocks (b)
Eastern Sambo (c)
Reference Area
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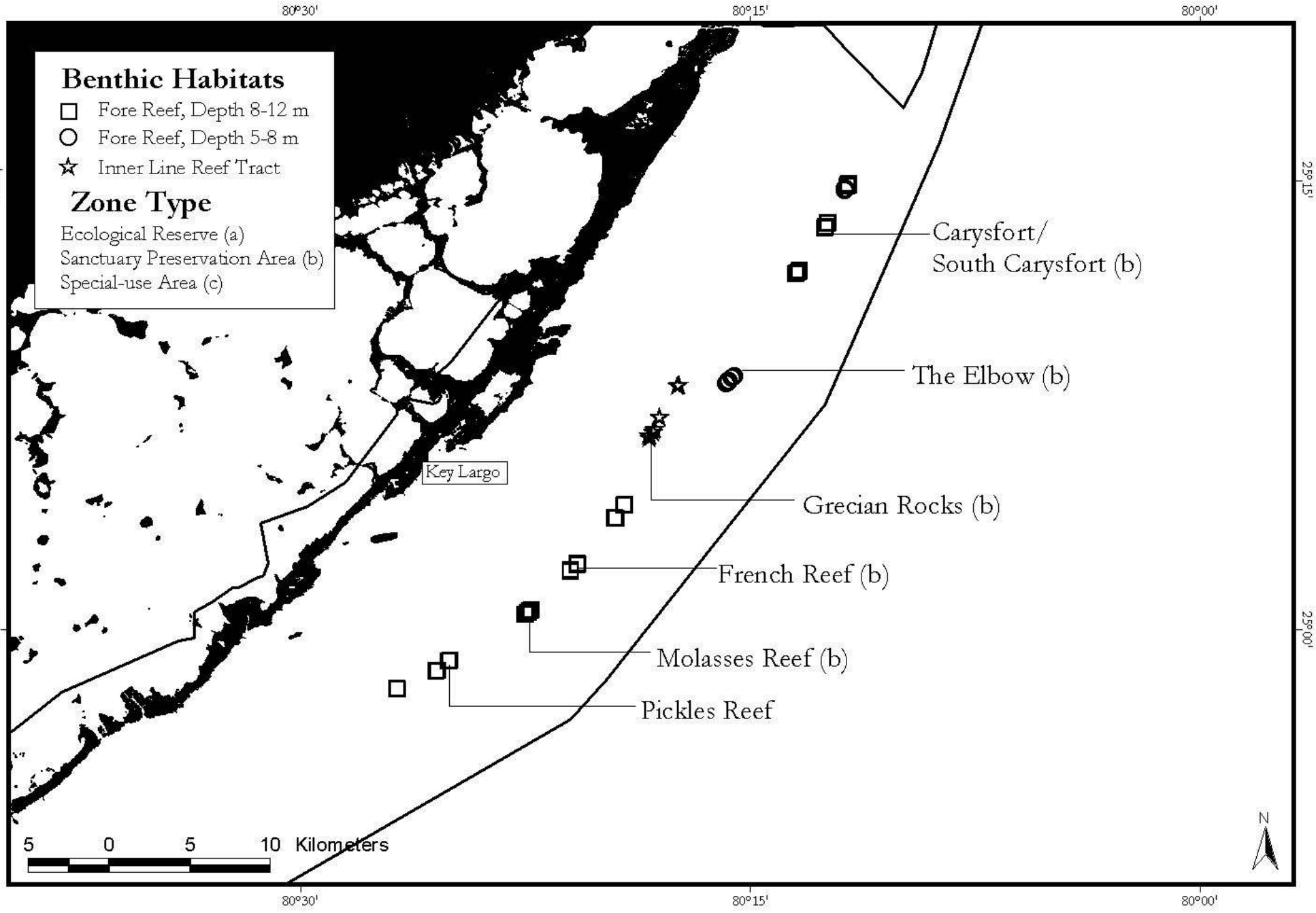
N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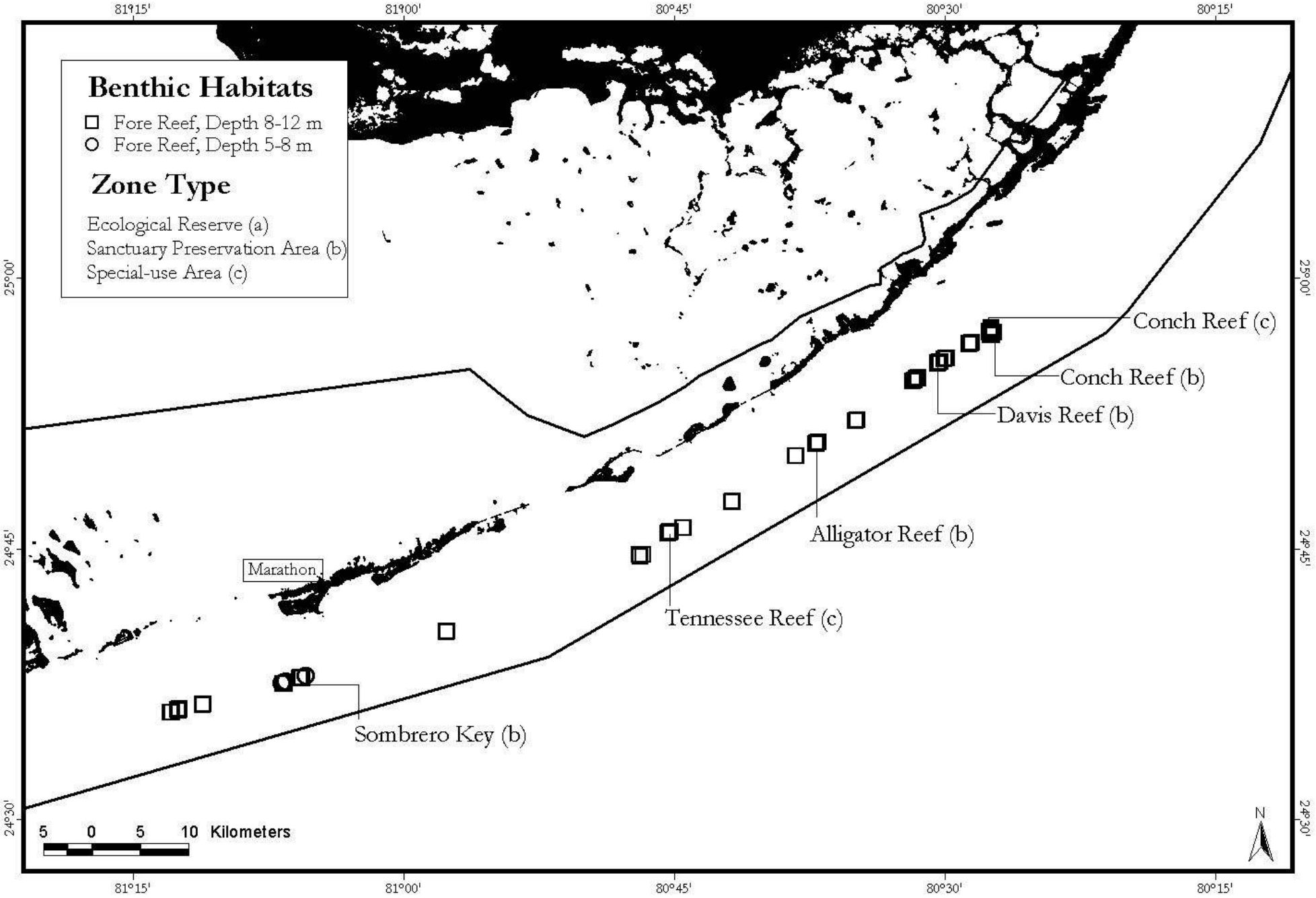
80°15'
80°00'
25°15'
25°00'
Benthic Habitats
Fore Reef, Depth 8-12 m
Fore Reef, Depth 5-8 m
Inner Line Reef Tract
Zone Type
Ecological Reserve (a)
Sanctuary Preservation Area (b)
Special-use Area (c)
Carysfort/
South Carysfort (b)
The Elbow (b)
Key Largo
Grecian Rocks (b)
French Reef (b)
Molasses Reef (b)
Pickles Reef
5 0 5 10 Kilometers
N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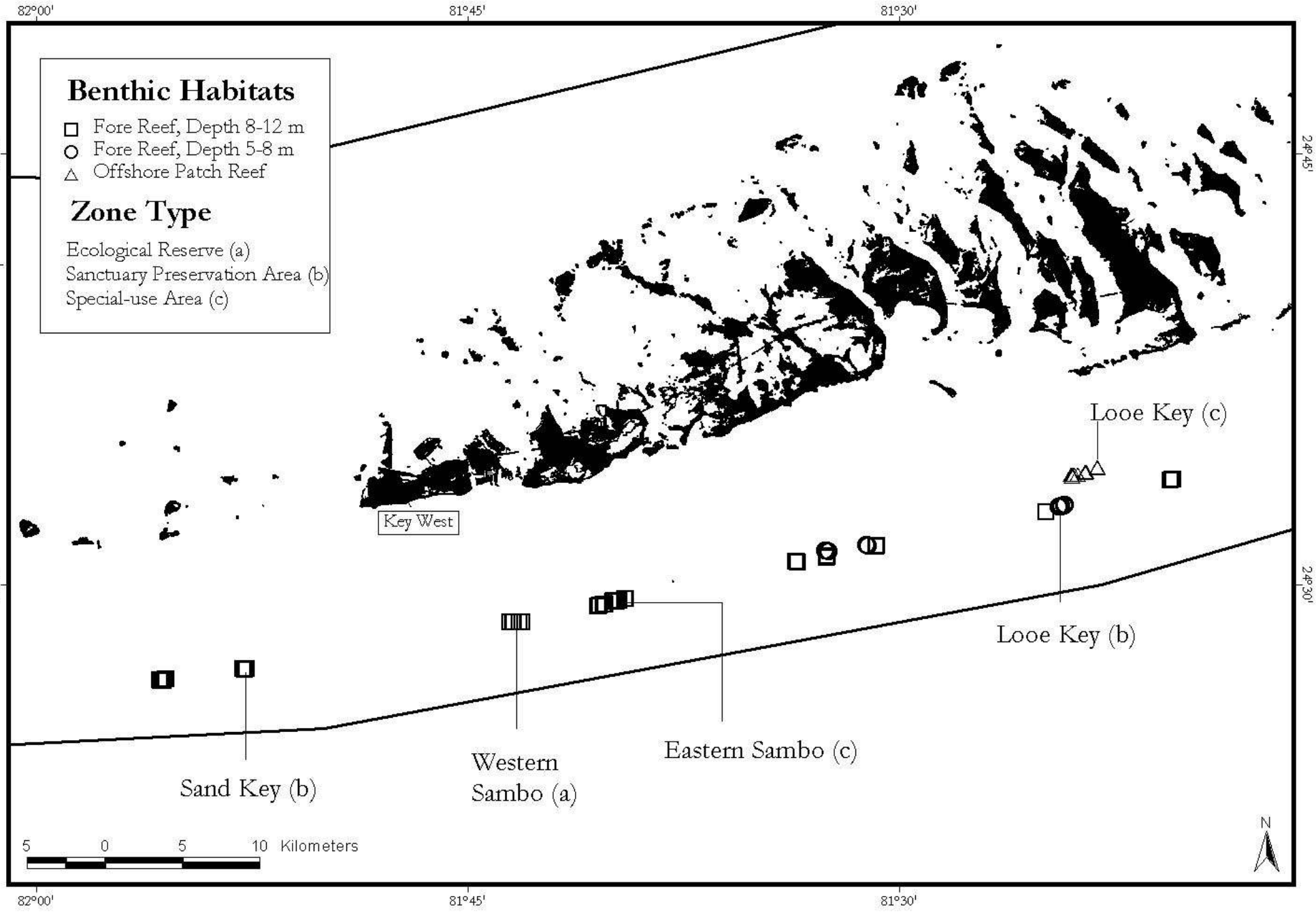
81°00'
80°45'
80°30'
80°15'
25°00'
24°45'
24°30'
Benthic Habitats
Fore Reef, Depth 8-12 m
Fore Reef, Depth 5-8 m
Zone Type
Ecological Reserve (a)
Sanctuary Preservation Area (b)
Special-use Area (c)
Conch Reef (c)
Conch Reef (b)
Davis Reef (b)
Alligator Reef (b)
Tennessee Reef (c)
Marathon
Sombrero Key (b)
5 0 5 10 Kilometers
N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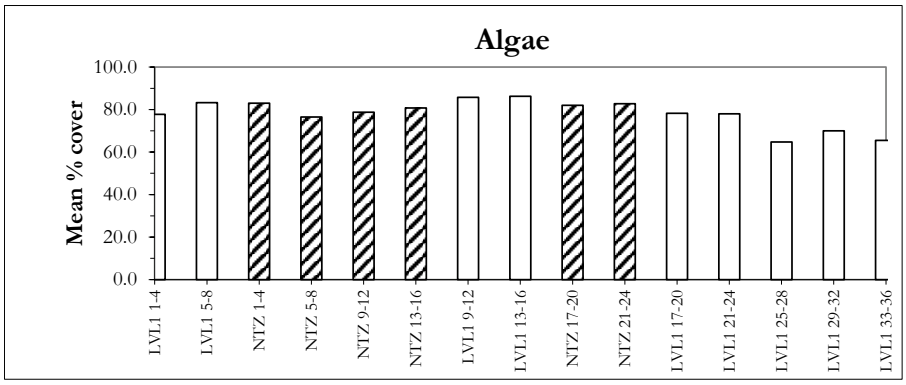
24°30'
Benthic Habitats
Fore Reef, Depth 8-12 m
Fore Reef, Depth 5-8 m
Offshore Patch Reef
Zone Type
Ecological Reserve (a)
Sanctuary Preservation Area (b)
Special-use Area (c)
Key West
Looe Key (c)
Looe Key (b)
Eastern Sambo (c)
Western Sambo (a)
Sand Key (b)
5 0 5 10 Kilometers
N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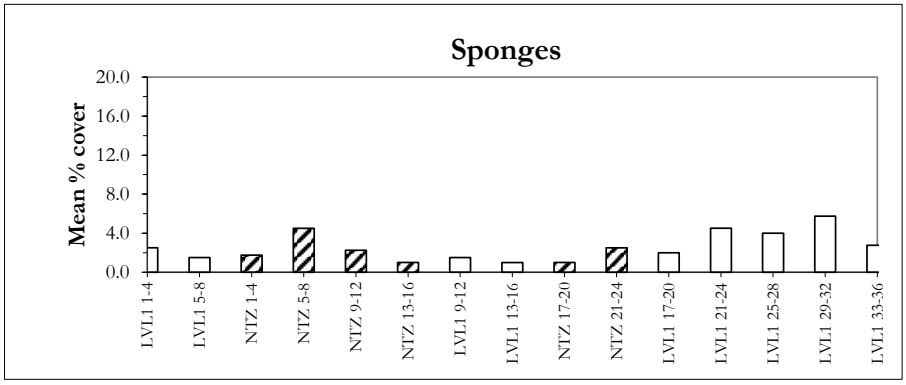
NTZ 5-8
NTZ 9-12
NTZ 13-16
LVL1 9-12
LVL1 13-16
NTZ 17-20
NTZ 21-24
LVL1 17-20
LVL1 21-24
LVL1 25-28
LVL1 29-32
LVL1 33-36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4.0
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NTZ 5-8
NTZ 9-12
NTZ 13-16
LVL1 9-12
LVL1 13-16
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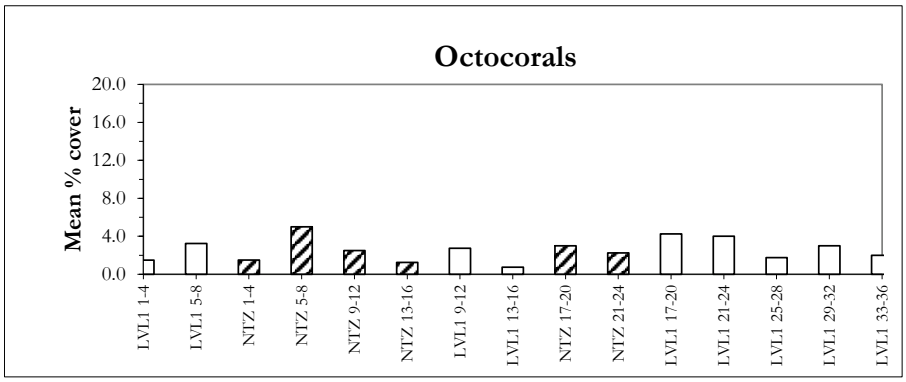
LVL1 21-24
LVL1 25-28
LVL1 29-32
LVL1 33-36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8.0
4.0
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NTZ 5-8
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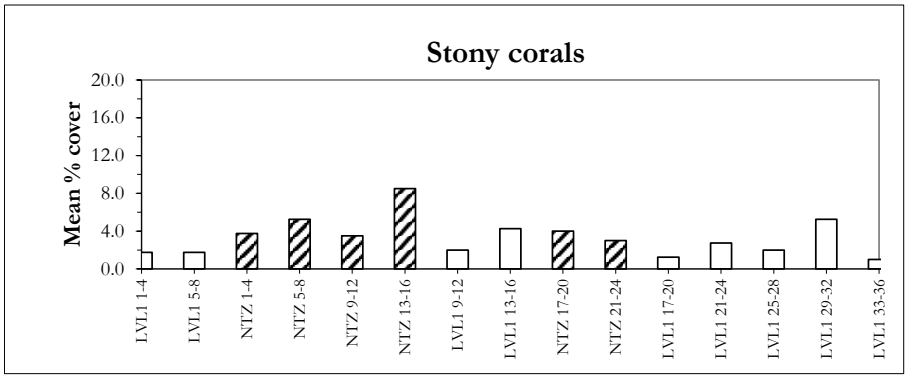
LVL1 21-24
LVL1 25-28
LVL1 29-32
LVL1 33-36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4.0
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NTZ 9-12
NTZ 13-16
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LVL1 13-16
NTZ 17-20
NTZ 21-24
LVL1 17-20
LVL1 21-24
LVL1 25-28
LVL1 29-32
LVL1 33-36

Algae
Mean % cover
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60.0
40.0
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0.0
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LVL1 61-64
LVL1 65-68
NTZ 45-48
NTZ 41-44
LVL1 53-56
LVL1 69-72
LVL1 73-76
LVL1 77-80
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NTZ 57-60
LVL1 81-84
LVL1 85-88
LVL1 89-92
NTZ 65-68
NTZ 69-72
LVL1 97-100
LVL1 109-112
LVL1 121-124
LVL1 101-104
NTZ 133-136
NTZ 129-132
LVL1 93-96
LVL1 105-108
LVL1 113-116
NTZ 73-76
NTZ 77-80
NTZ 81-84
NTZ 85-88
LVL1 129-132
LVL1 125-128

Sponges
Mean % cover
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16.0
12.0
8.0
4.0
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NTZ 45-48
NTZ 41-44
LVL1 53-56
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LVL1 73-76
LVL1 77-80
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LVL1 109-112
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LVL1 93-96
LVL1 105-108
LVL1 113-116
NTZ 73-76
NTZ 77-80
NTZ 81-84
NTZ 85-88
LVL1 129-132
LVL1 125-128

Octocorals
Mean % cover
20.0
16.0
12.0
8.0
4.0
0.0
LVL1 57-60
LVL1 61-64
LVL1 65-68
NTZ 45-48
NTZ 41-44
LVL1 53-56
LVL1 69-72
LVL1 73-76
LVL1 77-80
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LVL1 85-88
LVL1 89-92
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NTZ 133-136
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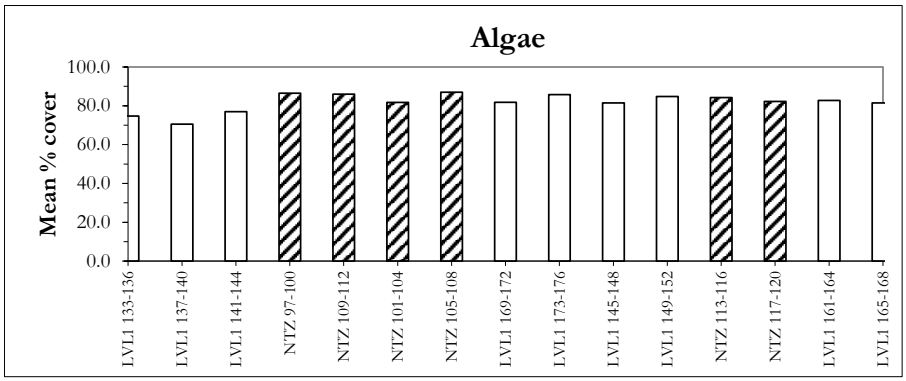
LVL1 93-96
LVL1 105-108
LVL1 113-116
NTZ 73-76
NTZ 77-80
NTZ 81-84
NTZ 85-88
LVL1 129-132
LVL1 125-128

Stony corals
Mean % cover
20.0
16.0
12.0
8.0
4.0
0.0
LVL1 57-60
LVL1 61-64
LVL1 65-68
NTZ 45-48
NTZ 41-44
LVL1 53-56
LVL1 69-72
LVL1 73-76
LVL1 77-80
NTZ 61-64
NTZ 57-60
LVL1 81-84
LVL1 85-88
LVL1 89-92
NTZ 65-68
NTZ 69-72
LVL1 97-100
LVL1 109-112
LVL1 121-124
LVL1 101-104
NTZ 133-136
NTZ 129-132
LVL1 93-96
LVL1 105-108
LVL1 113-116
NTZ 73-76
NTZ 77-80
NTZ 81-84
NTZ 85-88
LVL1 129-132
LVL1 125-128


Algae
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40.0
20.0
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LVL1 137-140
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NTZ 101-104
NTZ 105-108
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LVL1 149-152
NTZ 113-116
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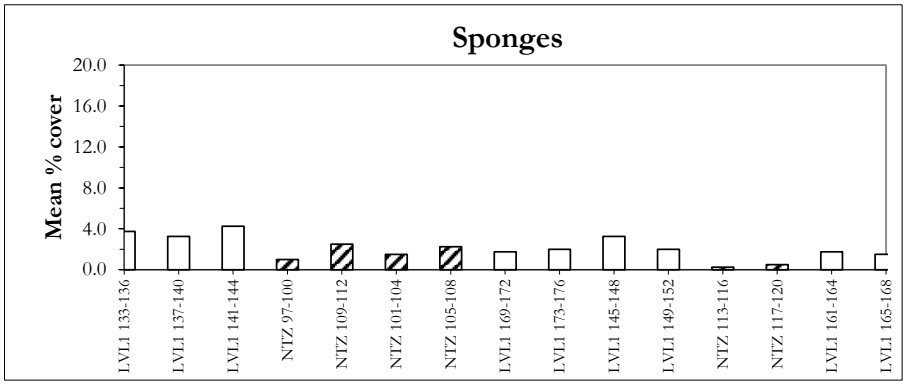
LVL1 161-164
LVL1 165-168


Sponges
Mean % cover
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8.0
4.0
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NTZ 97-100
NTZ 109-112
NTZ 101-104
NTZ 105-108
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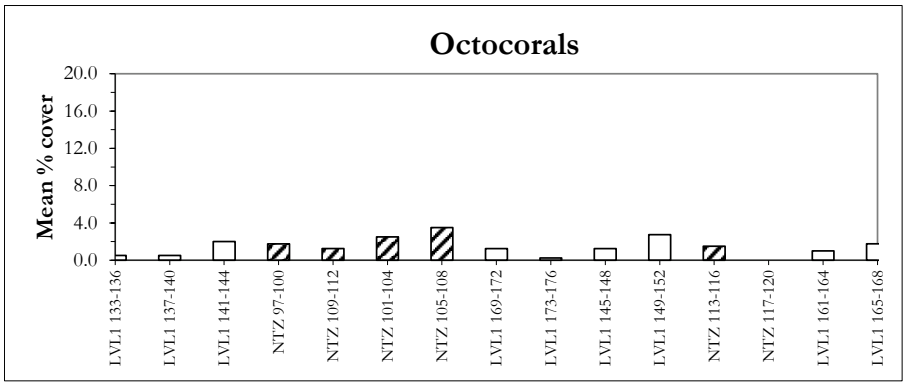
LVL1 149-152
NTZ 113-116
NTZ 117-120
LVL1 161-164
LVL1 165-168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8.0
4.0
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NTZ 97-100
NTZ 109-112
NTZ 101-104
NTZ 105-108
LVL1 169-172
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LVL1 145-148
LVL1 149-152
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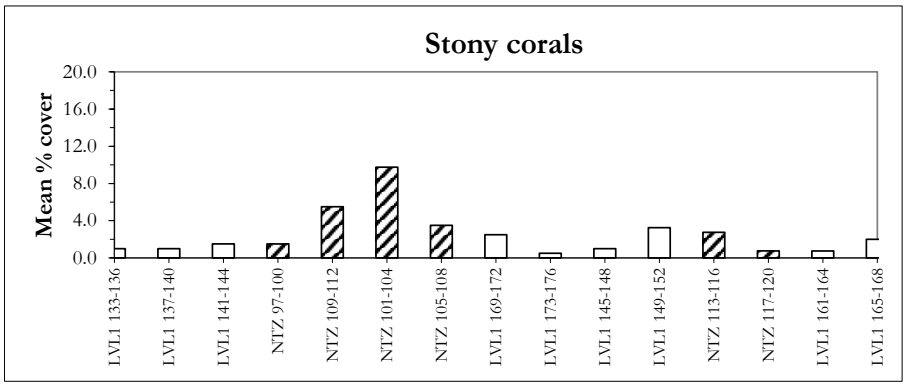
NTZ 117-120
LVL1 161-164
LVL1 165-168


Stony corals
Mean % cover
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16.0
12.0
8.0
4.0
0.0
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LVL1 137-140
LVL1 141-144
NTZ 97-100
NTZ 109-112
NTZ 101-104
NTZ 105-108
LVL1 169-172
LVL1 173-176
LVL1 145-148
LVL1 149-152
NTZ 113-116
NTZ 117-120
LVL1 161-164
LVL1 165-168

Algae
Mean % cover
100.0
80.0
60.0
40.0
20.0
0.0
LVL1 37-40
LVL1 41-44
NTZ 29-32
NTZ 25-28
NTZ 53-56
NTZ 49-52
LVL1 117-120
NTZ 89-92
NTZ 93-96
LVL1 177-180
LVL1 181-184
LVL1 153-156
NTZ 121-124
NTZ 125-128
LVL1 157-160

Sponges
Mean % cover
40.0
30.0
20.0
10.0
0.0
LVL1 37-40
LVL1 41-44
NTZ 29-32
NTZ 25-28
NTZ 53-56
NTZ 49-52
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NTZ 89-92
NTZ 93-96
LVL1 177-180
LVL1 181-184
LVL1 153-156
NTZ 121-124
NTZ 125-128
LVL1 157-160

Octocorals
Mean % cover
40.0
30.0
20.0
10.0
0.0
LVL1 37-40
LVL1 41-44
NTZ 29-32
NTZ 25-28
NTZ 53-56
NTZ 49-52
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NTZ 89-92
NTZ 93-96
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LVL1 153-156
NTZ 121-124
NTZ 125-128
LVL1 157-160

Stony corals
Mean % cover
40.0
30.0
20.0
10.0
0.0
LVL1 37-40
LVL1 41-44
NTZ 29-32
NTZ 25-28
NTZ 53-56
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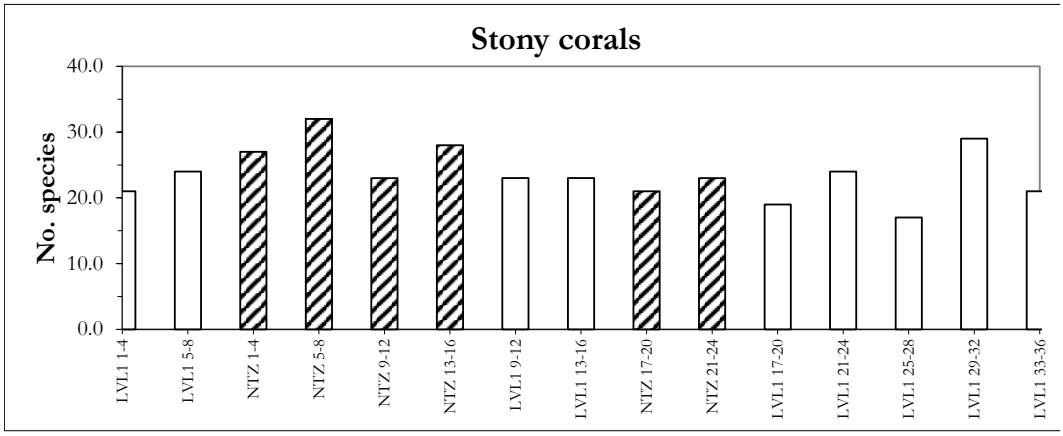
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NTZ 9-12
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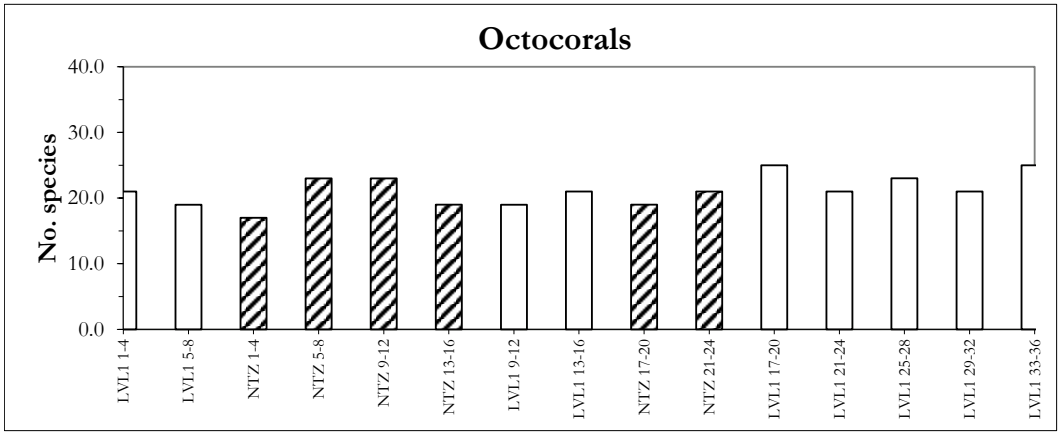
LVL1 29-32
LVL1 33-36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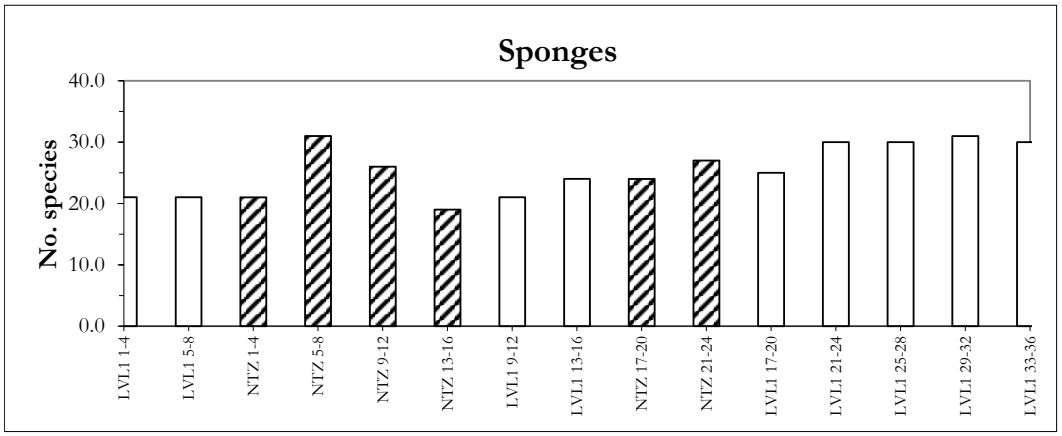
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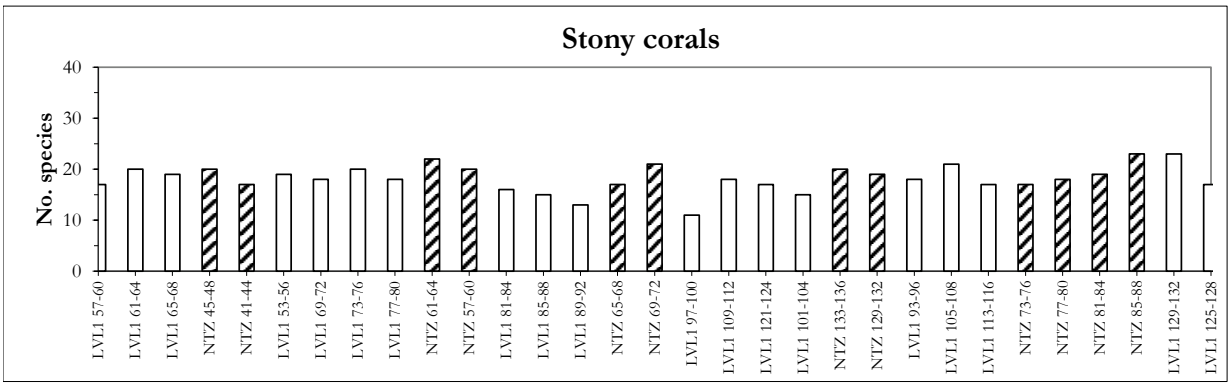
Stony corals
No. species
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20
30
40
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LVL1 53-56
LVL1 69-72
LVL1 73-76
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NTZ 61-64
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NTZ 65-68
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LVL1 121-124
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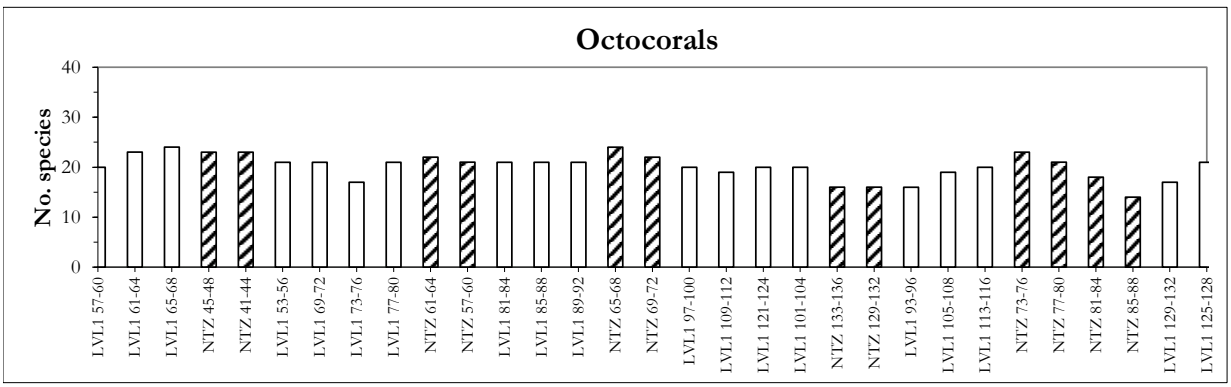
NTZ 85-88
LVL1 129-132
LVL1 125-128


Octocorals
No. species
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20
30
40
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NTZ 45-48
NTZ 41-44
LVL1 53-56
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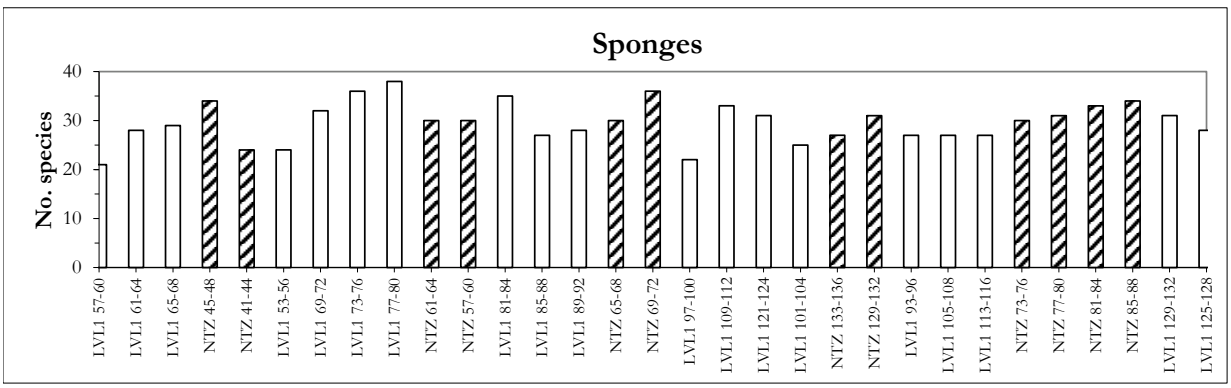
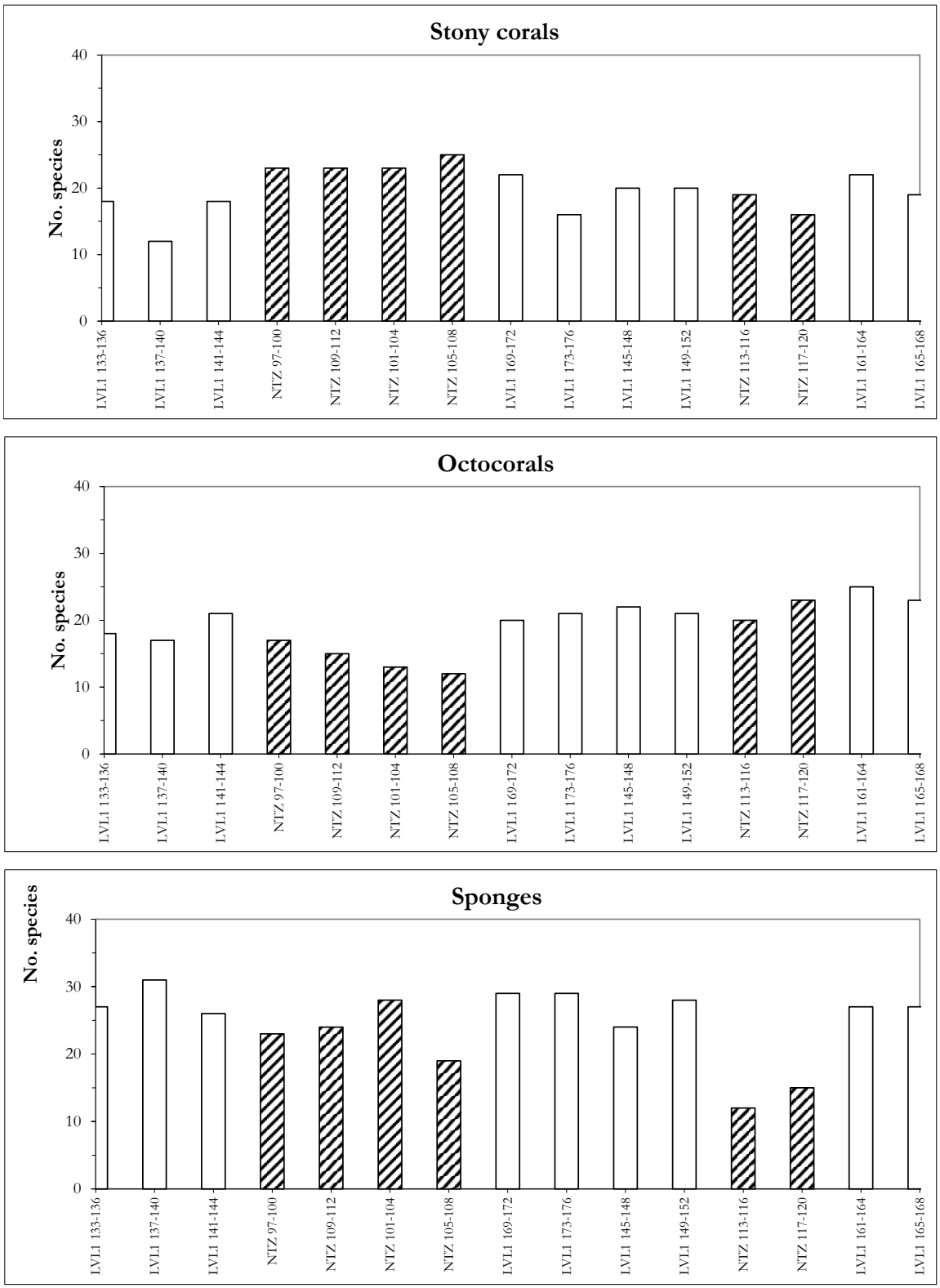
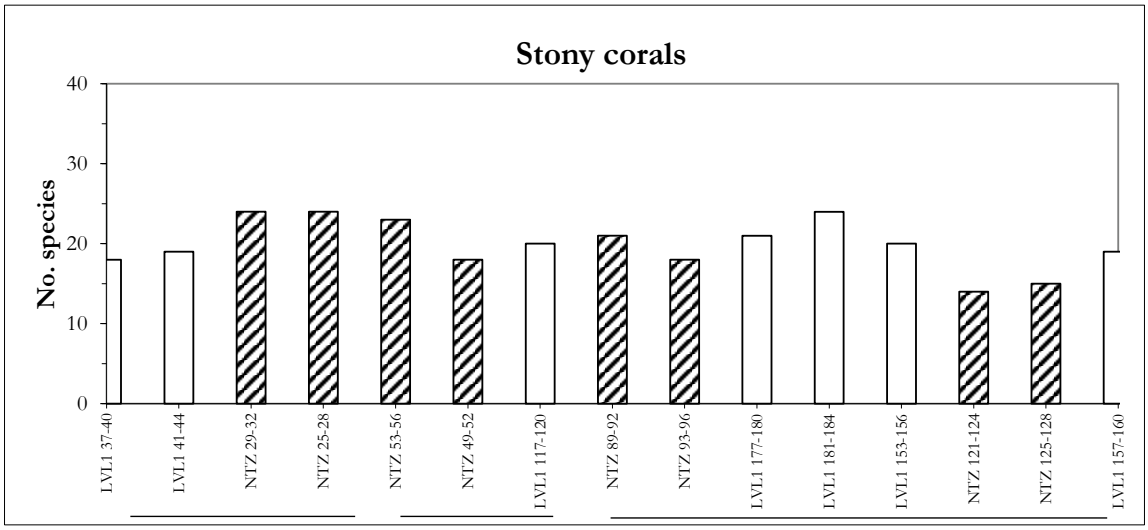
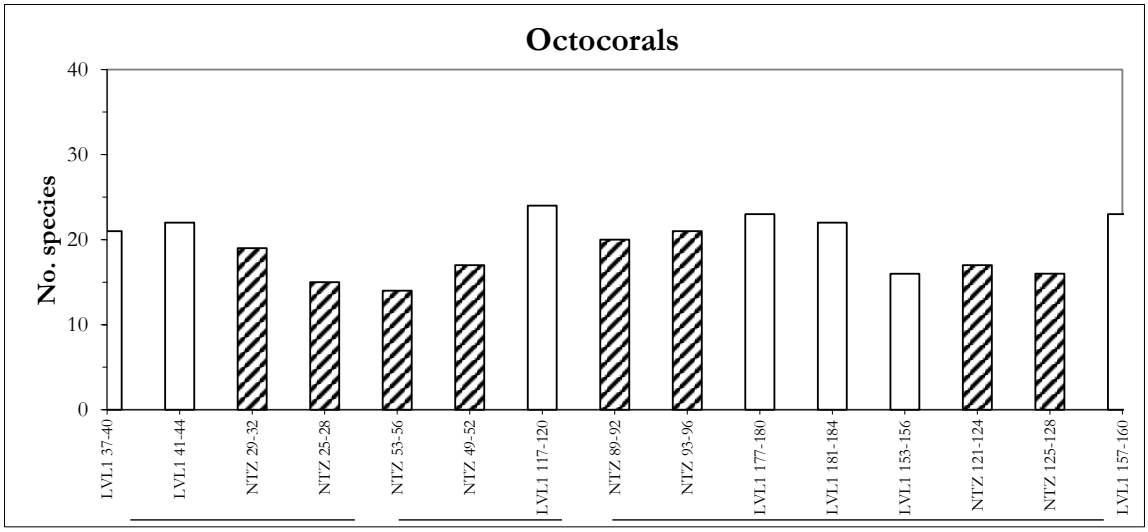
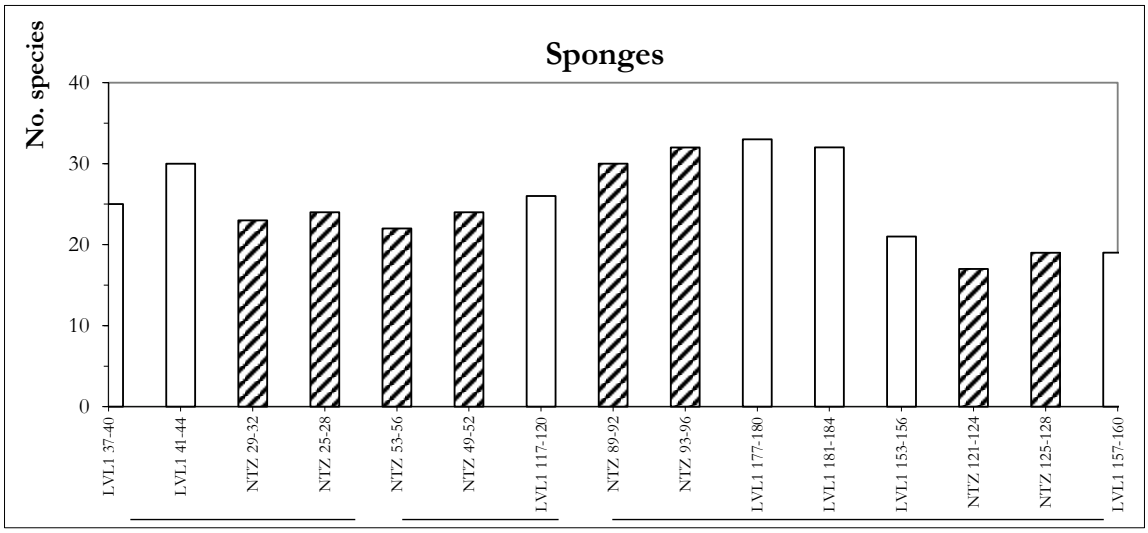
LVL1 93-96
LVL1 105-108
LVL1 113-116
NTZ 73-76
NTZ 77-80
NTZ 81-84
NTZ 85-88
LVL1 129-132
LVL1 125-128

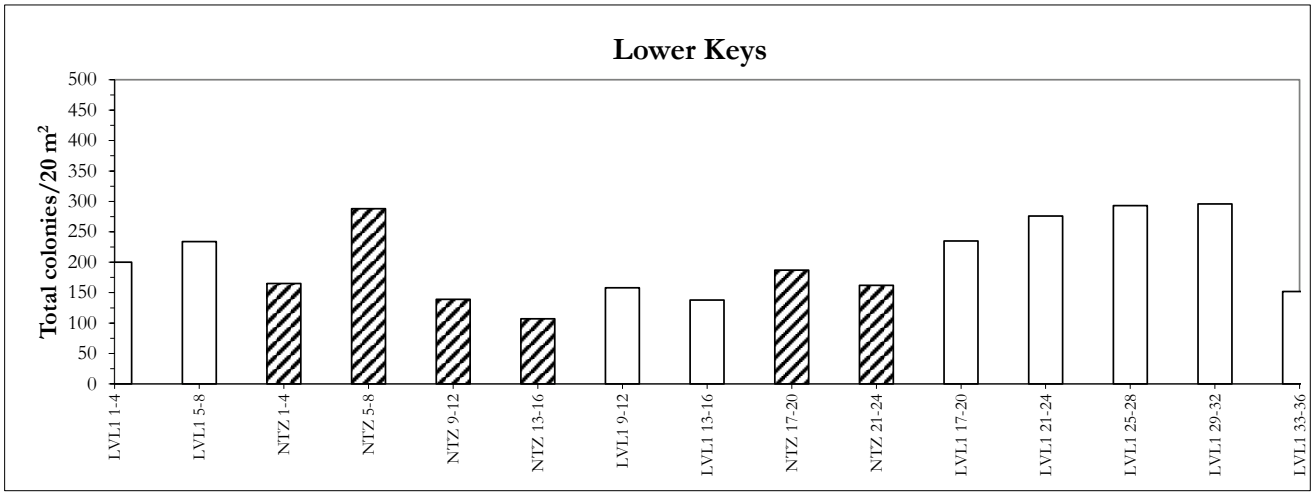

Sponges
No. species
0
10
20
30
40
LVL1 57-60
LVL1 61-64
LVL1 65-68
NTZ 45-48
NTZ 41-44
LVL1 53-56
LVL1 69-72
LVL1 73-76
LVL1 77-80
NTZ 61-64
NTZ 57-60
LVL1 81-84
LVL1 85-88
LVL1 89-92
NTZ 65-68
NTZ 69-72
LVL1 97-100
LVL1 109-112
LVL1 121-124
LVL1 101-104
NTZ 133-136
NTZ 129-132
LVL1 93-96
LVL1 105-108
LVL1 113-116
NTZ 73-76
NTZ 77-80
NTZ 81-84
NTZ 85-88
LVL1 129-132
LVL1 125-128

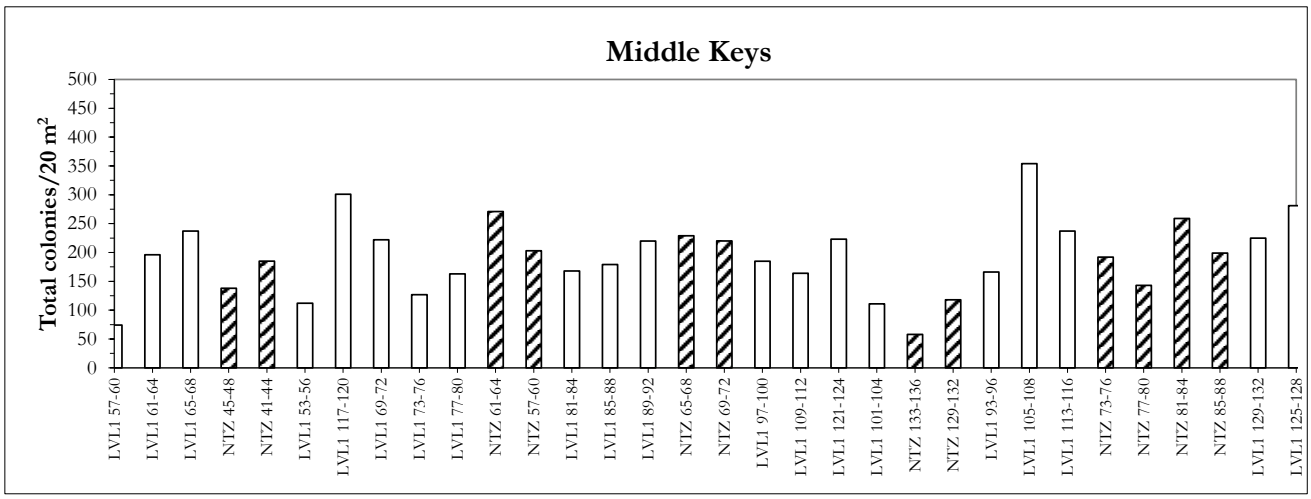

Stony corals
No. species
0
10
20
30
40
LVL1 133-136
LVL1 137-140
LVL1 141-144
NTZ 97-100
NTZ 109-112
NTZ 101-104
NTZ 105-108
LVL1 169-172
LVL1 173-176
LVL1 145-148
LVL1 149-152
NTZ 113-116
NTZ 117-120
LVL1 161-164
LVL1 165-168
Octocorals
No. species
0
10
20
30
40
LVL1 133-136
LVL1 137-140
LVL1 141-144
NTZ 97-100
NTZ 109-112
NTZ 101-104
NTZ 105-108
LVL1 169-172
LVL1 173-176
LVL1 145-148
LVL1 149-152
NTZ 113-116
NTZ 117-120
LVL1 161-164
LVL1 165-168
Sponges
No. species
0
10
20
30
40
LVL1 133-136
LVL1 137-140
LVL1 141-144
NTZ 97-100
NTZ 109-112
NTZ 101-104
NTZ 105-108
LVL1 169-172
LVL1 173-176
LVL1 145-148
LVL1 149-152
NTZ 113-116
NTZ 117-120
LVL1 161-164
LVL1 165-168

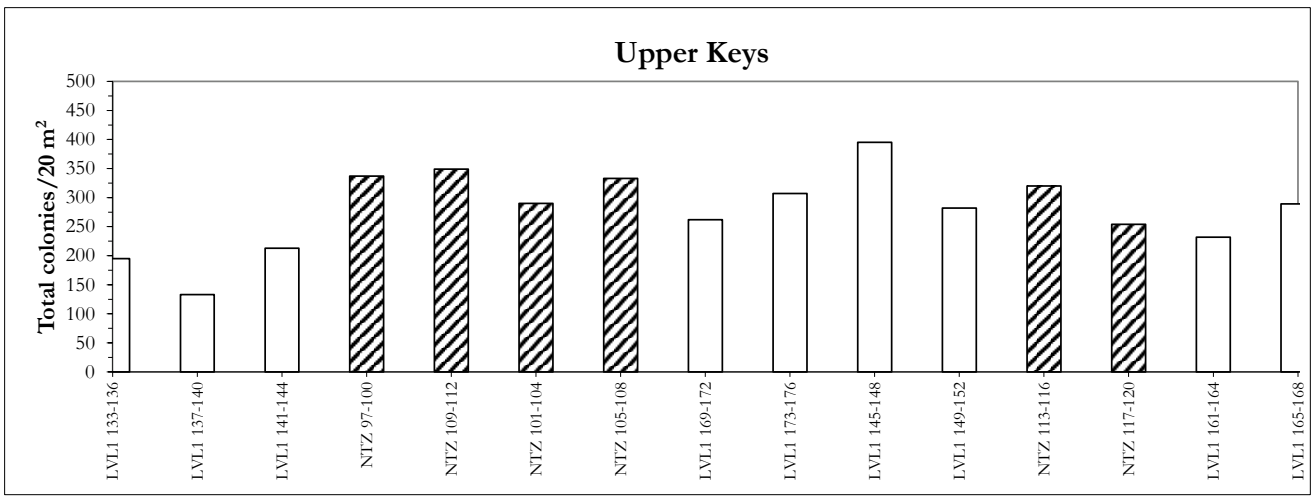

Stony corals
No. species
40
30
20
10
0
LVL1 37-40
LVL1 41-44
NTZ 29-32
NTZ 25-28
NTZ 53-56
NTZ 49-52
LVL1 117-120
NTZ 89-92
NTZ 93-96
LVL1 177-180
LVL1 181-184
LVL1 153-156
NTZ 121-124
NTZ 125-128
LVL1 157-160

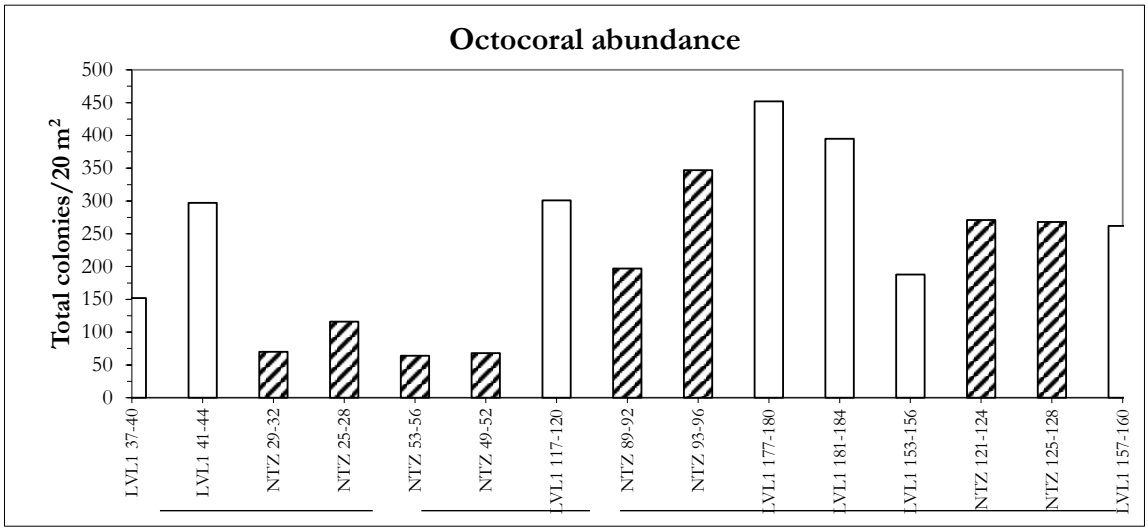

Octocorals
No. species
40
30
20
10
0
LVL1 37-40
LVL1 41-44
NTZ 29-32
NTZ 25-28
NTZ 53-56
NTZ 49-52
LVL1 117-120
NTZ 89-92
NTZ 93-96
LVL1 177-180
LVL1 181-184
LVL1 153-156
NTZ 121-124
NTZ 125-128
LVL1 157-160

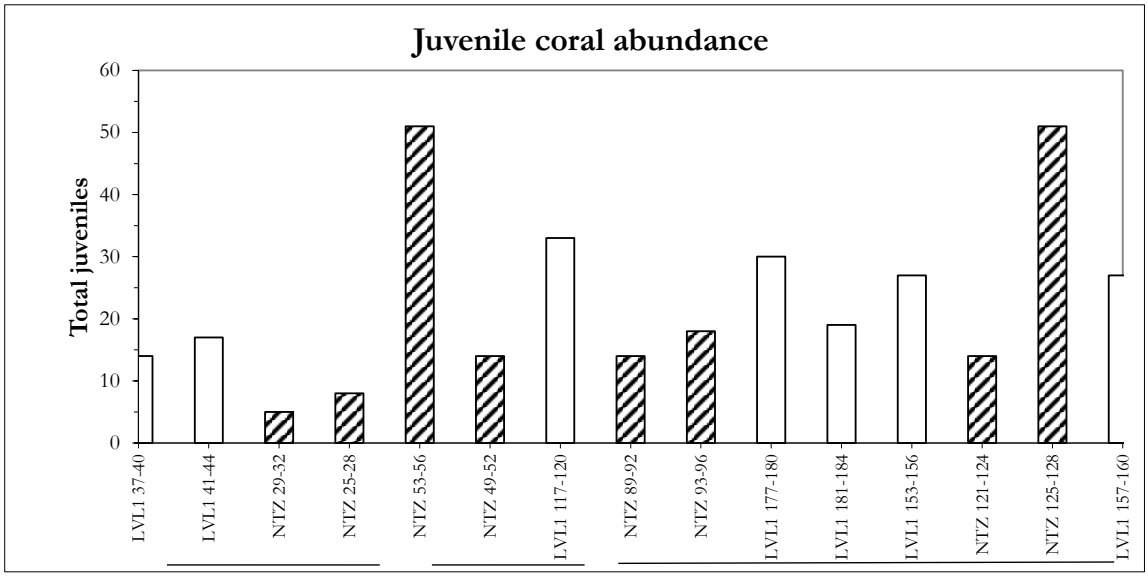

Sponges
No. species
40
30
20
10
0
LVL1 37-40
LVL1 41-44
NTZ 29-32
NTZ 25-28
NTZ 53-56
NTZ 49-52
LVL1 117-120
NTZ 89-92
NTZ 93-96
LVL1 177-180
LVL1 181-184
LVL1 153-156
NTZ 121-124
NTZ 125-128
LVL1 157-160

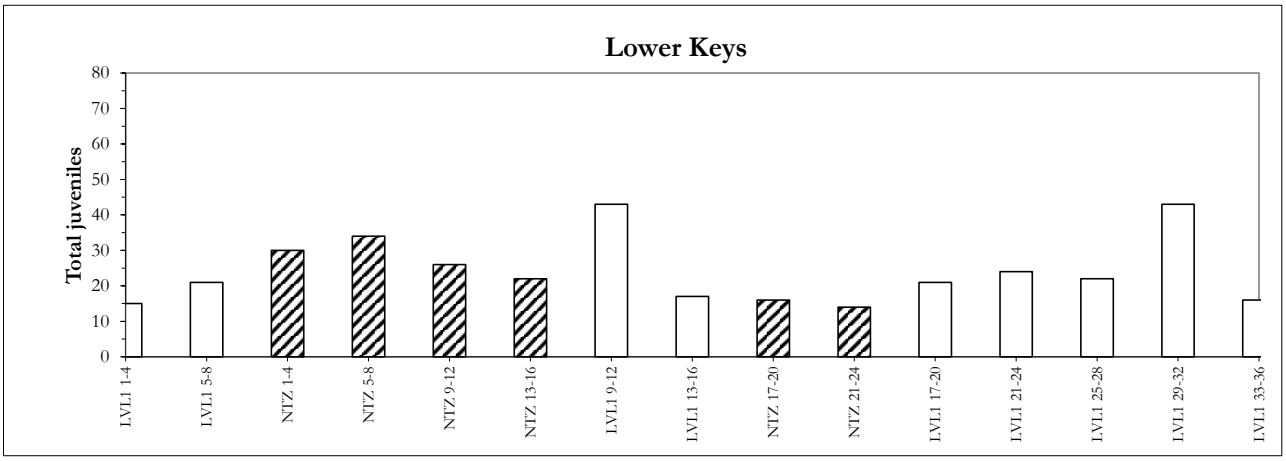

Lower Keys
Total colonies/20 m²
500
450
400
350
300
250
200
150
100
50
0
LVL1 1-4
LVL1 5-8
NTZ 1-4
NTZ 5-8
NTZ 9-12
NTZ 13-16
LVL1 9-12
LVL1 13-16
NTZ 17-20
NTZ 21-24
LVL1 17-20
LVL1 21-24
LVL1 25-28
LVL1 29-32
LVL1 33-36

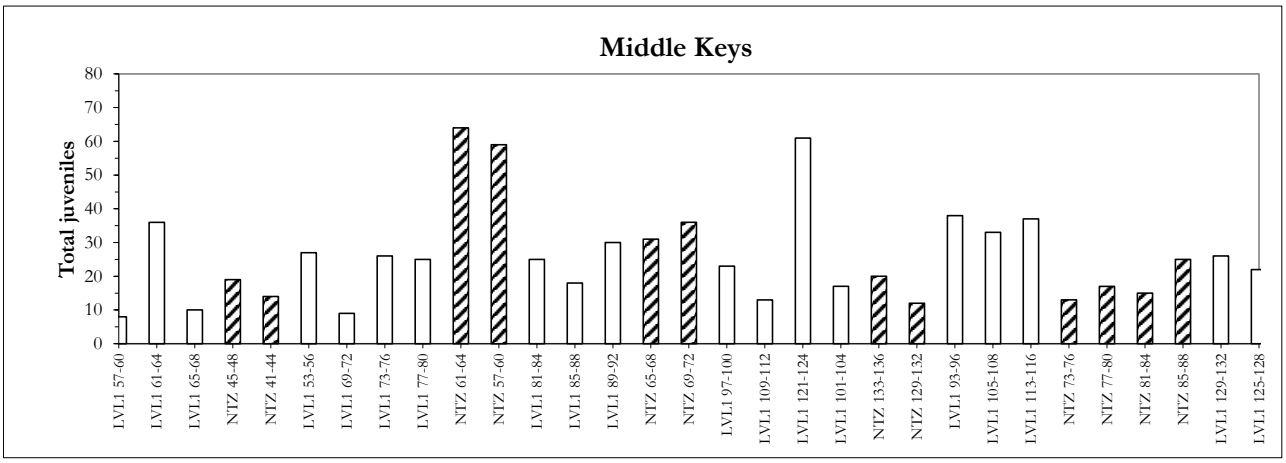

Middle Keys
Total colonies/20 m²
500
450
400
350
300
250
200
150
100
50
0
LVL1 57-60
LVL1 61-64
LVL1 65-68
NTZ 45-48
NTZ 41-44
LVL1 53-56
LVL1 117-120
LVL1 69-72
LVL1 73-76
LVL1 77-80
NTZ 61-64
NTZ 57-60
LVL1 81-84
LVL1 85-88
LVL1 89-92
NTZ 65-68
NTZ 69-72
LVL1 97-100
LVL1 109-112
LVL1 121-124
LVL1 101-104
NTZ 133-136
NTZ 129-132
LVL1 93-96
LVL1 105-108
LVL1 113-116
NTZ 73-76
NTZ 77-80
NTZ 81-84
NTZ 85-88
LVL1 129-132
LVL1 125-128

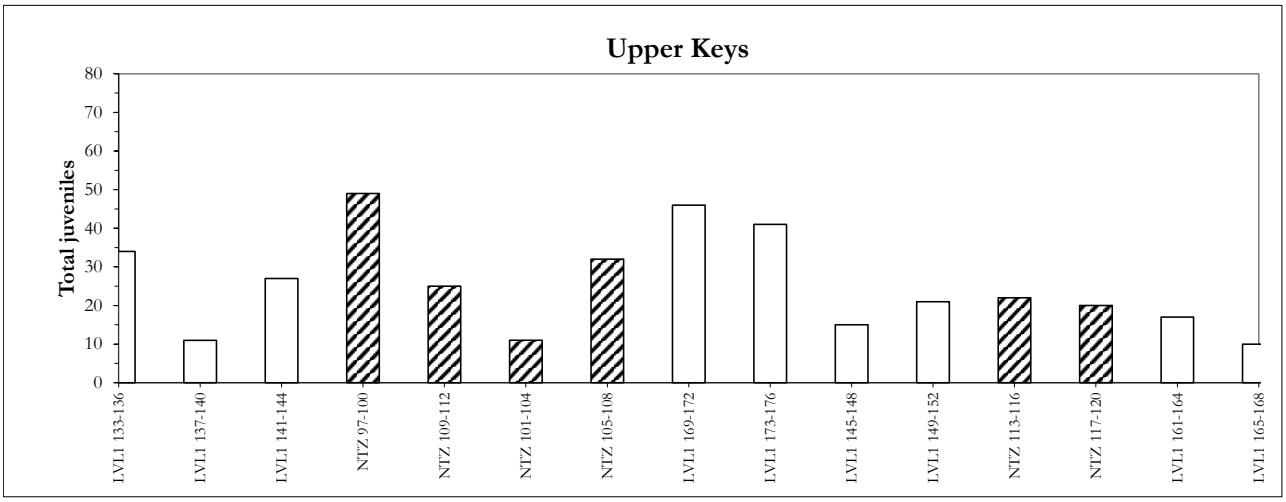

Upper Keys
Total colonies/20 m²
500
450
400
350
300
250
200
150
100
50
0
LVL1 133-136
LVL1 137-140
LVL1 141-144
NTZ 97-100
NTZ 109-112
NTZ 101-104
NTZ 105-108
LVL1 169-172
LVL1 173-176
LVL1 145-148
LVL1 149-152
NTZ 113-116
NTZ 117-120
LVL1 161-164
LVL1 165-168


Octocoral abundance
Total colonies/20 m2
500
450
400
350
300
250
200
150
100
50
0
LVL1 37-40
LVL1 41-44
NTZ 29-32
NTZ 25-28
NTZ 53-56
NTZ 49-52
LVL1 117-120
NTZ 89-92
NTZ 93-96
LVL1 177-180
LVL1 181-184
LVL1 153-156
NTZ 121-124
NTZ 125-128
LVL1 157-160


Juvenile coral abundance
Total juveniles
60
50
40
30
20
10
0
LVL1 37-40
LVL1 41-44
NTZ 29-32
NTZ 25-28
NTZ 53-56
NTZ 49-52
LVL1 117-120
NTZ 89-92
NTZ 93-96
LVL1 177-180
LVL1 181-184
LVL1 153-156
NTZ 121-124
NTZ 125-128
LVL1 157-160


Lower Keys
Total juveniles
0
10
20
30
40
50
60
70
80
LVL1 1-4
LVL1 5-8
NTZ 1-4
NTZ 5-8
NTZ 9-12
NTZ 13-16
LVL1 9-12
LVL1 13-16
NTZ 17-20
NTZ 21-24
LVL1 17-20
LVL1 21-24
LVL1 25-28
LVL1 29-32
LVL1 33-36


Middle Keys
Total juveniles
0
10
20
30
40
50
60
70
80
LVL1 57-60
LVL1 61-64
LVL1 65-68
NTZ 45-48
NTZ 41-44
LVL1 53-56
LVL1 69-72
LVL1 73-76
LVL1 77-80
NTZ 61-64
NTZ 57-60
LVL1 81-84
LVL1 85-88
LVL1 89-92
NTZ 65-68
NTZ 69-72
LVL1 97-100
LVL1 109-112
LVL1 121-124
LVL1 101-104
NTZ 133-136
NTZ 129-132
LVL1 93-96
LVL1 105-108
LVL1 113-116
NTZ 73-76
NTZ 77-80
NTZ 81-84
NTZ 85-88
LVL1 129-132
LVL1 125-128


Upper Keys
Total juveniles
0
10
20
30
40
50
60
70
80
LVL1 133-136
LVL1 137-140
LVL1 141-144
NTZ 97-100
NTZ 109-112
NTZ 101-104
NTZ 105-108
LVL1 169-172
LVL1 173-176
LVL1 145-148
LVL1 149-152
NTZ 113-116
NTZ 117-120
LVL1 161-164
LVL1 165-168

Block/Ref #	General Location	Region	Date	Lat (Deg N)	Lat (Min N)	Long (Deg W)	Long (Min W)
LVL1 1	Western Dry Rocks	Lower Keys	8/6/99	24	26.707	81	55.693
LVL1 2	Western Dry Rocks	Lower Keys	8/6/99	24	26.672	81	55.669
LVL1 3	Western Dry Rocks	Lower Keys	8/6/99	24	26.663	81	55.588
LVL1 4	Western Dry Rocks	Lower Keys	8/6/99	24	26.669	81	55.669
LVL1 5	Western Dry Rocks	Lower Keys	8/6/99	24	26.672	81	55.629
LVL1 6	Western Dry Rocks	Lower Keys	8/6/99	24	26.674	81	55.612
LVL1 7	Western Dry Rocks	Lower Keys	8/7/99	24	26.741	81	55.514
LVL1 8	Western Dry Rocks	Lower Keys	8/7/99	24	26.741	81	55.465
NTZ 1	Sand Key SPA	Lower Keys	8/10/99	24	27.085	81	52.697
NTZ 2	Sand Key SPA	Lower Keys	8/10/99	24	27.087	81	52.711
NTZ 3	Sand Key SPA	Lower Keys	8/10/99	24	27.095	81	52.706
NTZ 4	Sand Key SPA	Lower Keys	8/10/99	24	27.088	81	52.724
NTZ 5	Sand Key SPA	Lower Keys	8/10/99	24	27.079	81	52.812
NTZ 6	Sand Key SPA	Lower Keys	8/10/99	24	27.077	81	52.806
NTZ 7	Sand Key SPA	Lower Keys	8/10/99	24	27.074	81	52.767
NTZ 8	Sand Key SPA	Lower Keys	8/10/99	24	27.080	81	52.736
NTZ 9	Western Sambo SPA	Lower Keys	8/9/99	24	28.725	81	43.438
NTZ 10	Western Sambo SPA	Lower Keys	8/9/99	24	28.717	81	43.400
NTZ 11	Western Sambo SPA	Lower Keys	8/9/99	24	28.719	81	43.455
NTZ 12	Western Sambo SPA	Lower Keys	8/9/99	24	28.722	81	43.545
NTZ 13	Western Sambo SPA	Lower Keys	8/9/99	24	28.712	81	43.126
NTZ 14	Western Sambo SPA	Lower Keys	8/9/99	24	28.714	81	43.126
NTZ 15	Western Sambo SPA	Lower Keys	8/9/99	24	28.728	81	43.208
NTZ 16	Western Sambo SPA	Lower Keys	8/9/99	24	28.728	81	43.122
LVL1 9	Middle Sambo Reef	Lower Keys	8/8/99	24	29.270	81	40.486
LVL1 10	Middle Sambo Reef	Lower Keys	8/8/99	24	29.277	81	40.480
LVL1 11	Middle Sambo Reef	Lower Keys	8/8/99	24	29.296	81	40.423
LVL1 12	Middle Sambo Reef	Lower Keys	8/8/99	24	29.271	81	40.457
LVL1 13	Middle Sambo Reef	Lower Keys	8/8/99	24	29.344	81	40.246
LVL1 14	Middle Sambo Reef	Lower Keys	8/8/99	24	29.330	81	40.270
LVL1 15	Middle Sambo Reef	Lower Keys	8/8/99	24	29.325	81	40.280
LVL1 16	Middle Sambo Reef	Lower Keys	8/8/99	24	29.338	81	40.241
NTZ 17	Eastern Sambo SPA	Lower Keys	8/7/99	24	29.439	81	39.865
NTZ 18	Eastern Sambo SPA	Lower Keys	8/7/99	24	29.441	81	39.853
NTZ 19	Eastern Sambo SPA	Lower Keys	8/7/99	24	29.451	81	39.939
NTZ 20	Eastern Sambo SPA	Lower Keys	8/7/99	24	29.417	81	39.970
NTZ 21	Eastern Sambo SPA	Lower Keys	8/7/99	24	29.464	81	39.753
NTZ 22	Eastern Sambo SPA	Lower Keys	8/7/99	24	29.468	81	39.765
NTZ 23	Eastern Sambo SPA	Lower Keys	8/8/99	24	29.516	81	39.521
NTZ 24	Eastern Sambo SPA	Lower Keys	8/8/99	24	29.519	81	39.545
LVL1 17	Maryland Shoal	Lower Keys	8/11/99	24	30.832	81	33.579
LVL1 18	Maryland Shoal	Lower Keys	8/11/99	24	30.793	81	33.543
LVL1 19	Maryland Shoal	Lower Keys	8/11/99	24	30.801	81	33.547
LVL1 20	Maryland Shoal	Lower Keys	8/11/99	24	30.832	81	33.595
LVL1 21	West of American Shoal	Lower Keys	8/12/99	24	30.963	81	32.540
LVL1 22	West of American Shoal	Lower Keys	8/12/99	24	30.982	81	32.541
LVL1 23	West of American Shoal	Lower Keys	8/13/99	24	30.997	81	32.514
LVL1 24	West of American Shoal	Lower Keys	8/13/99	24	31.006	81	32.529
LVL1 37	West of American Shoal	Lower Keys	8/12/99	24	31.165	81	32.564
LVL1 38	West of American Shoal	Lower Keys	8/12/99	24	31.135	81	32.443
LVL1 39	West of American Shoal	Lower Keys	8/13/99	24	31.174	81	32.537
LVL1 40	West of American Shoal	Lower Keys	8/13/99	24	31.182	81	32.516
LVL1 41	American Shoal	Lower Keys	8/13/99	24	31.353	81	31.078
LVL1 42	American Shoal	Lower Keys	8/13/99	24	31.357	81	31.089
LVL1 43	American Shoal	Lower Keys	8/13/99	24	31.382	81	31.123
LVL1 44	American Shoal	Lower Keys	8/13/99	24	31.372	81	31.135
LVL1 25	American Shoal	Lower Keys	8/12/99	24	31.358	81	30.793

LVL1 26	American Shoal	Lower Keys	8/12/99	24	31.354	81	30.811
LVL1 27	American Shoal	Lower Keys	8/12/99	24	31.366	81	30.770
LVL1 28	American Shoal	Lower Keys	8/12/99	24	31.364	81	30.794
LVL1 29	Southwestern Looe Key	Lower Keys	8/28/99	24	32.546	81	24.922
LVL1 30	Southwestern Looe Key	Lower Keys	8/28/99	24	32.552	81	24.903
LVL1 31	Southwestern Looe Key	Lower Keys	8/28/99	24	32.552	81	24.900
LVL1 32	Southwestern Looe Key	Lower Keys	8/28/99	24	32.548	81	24.922
NTZ 29	Looe Key SPA	Lower Keys	8/27/99	24	32.719	81	24.365
NTZ 30	Looe Key SPA	Lower Keys	8/27/99	24	32.722	81	24.376
NTZ 31	Looe Key SPA	Lower Keys	8/27/99	24	32.709	81	24.422
NTZ 32	Looe Key SPA	Lower Keys	8/27/99	24	32.703	81	24.447
NTZ 25	Looe Key SPA	Lower Keys	8/26/99	24	32.762	81	24.268
NTZ 26	Looe Key SPA	Lower Keys	8/26/99	24	32.736	81	24.243
NTZ 27	Looe Key SPA	Lower Keys	8/26/99	24	32.767	81	24.217
NTZ 28	Looe Key SPA	Lower Keys	8/26/99	24	32.777	81	24.214
LVL1 45	Southwest of Looe Key RO	Lower Keys	8/26/99	24	33.830	81	24.027
LVL1 46	Southwest of Looe Key RO	Lower Keys	8/26/99	24	33.786	81	24.019
LVL1 47	Southwest of Looe Key RO	Lower Keys	8/27/99	24	33.842	81	23.988
LVL1 48	Southwest of Looe Key RO	Lower Keys	8/27/99	24	33.843	81	23.951
LVL1 49	West of Looe Key RO	Lower Keys	8/27/99	24	33.842	81	23.814
LVL1 50	West of Looe Key RO	Lower Keys	8/27/99	24	33.833	81	23.810
LVL1 51	West of Looe Key RO	Lower Keys	8/28/99	24	33.837	81	23.799
LVL1 52	West of Looe Key RO	Lower Keys	8/28/99	24	33.831	81	23.799
NTZ 33	Looe Key Research Only	Lower Keys	8/14/99	24	33.919	81	23.547
NTZ 34	Looe Key Research Only	Lower Keys	8/14/99	24	33.929	81	23.517
NTZ 35	Looe Key Research Only	Lower Keys	8/25/99	24	33.928	81	23.534
NTZ 36	Looe Key Research Only	Lower Keys	8/25/99	24	33.893	81	23.549
NTZ 37	Looe Key Research Only	Lower Keys	8/25/99	24	34.078	81	23.117
NTZ 38	Looe Key Research Only	Lower Keys	8/25/99	24	34.078	81	23.124
NTZ 39	Looe Key Research Only	Lower Keys	8/26/99	24	34.096	81	23.126
NTZ 40	Looe Key Research Only	Lower Keys	8/26/99	24	34.073	81	23.124
LVL1 33	West of Big Pine Shoal	Lower Keys	8/28/99	24	33.670	81	20.529
LVL1 34	West of Big Pine Shoal	Lower Keys	8/28/99	24	33.666	81	20.517
LVL1 35	West of Big Pine Shoal	Lower Keys	8/28/99	24	33.656	81	20.592
LVL1 36	West of Big Pine Shoal	Lower Keys	8/28/99	24	33.672	81	20.514
LVL1 57	South of Big Pine Key	Middle Keys	8/29/99	24	35.914	81	12.911
LVL1 58	South of Big Pine Key	Middle Keys	8/29/99	24	35.913	81	12.852
LVL1 59	South of Big Pine Key	Middle Keys	8/29/99	24	35.930	81	12.940
LVL1 60	South of Big Pine Key	Middle Keys	8/29/99	24	35.920	81	12.950
LVL1 61	Southeast of Big Pine Key	Middle Keys	8/29/99	24	36.103	81	12.429
LVL1 62	Southeast of Big Pine Key	Middle Keys	8/29/99	24	36.083	81	12.412
LVL1 63	Southeast of Big Pine Key	Middle Keys	8/29/99	24	36.051	81	12.516
LVL1 64	Southeast of Big Pine Key	Middle Keys	8/29/99	24	36.041	81	12.479
LVL1 65	West of Sombrero Reef	Middle Keys	8/30/99	24	36.348	81	11.164
LVL1 66	West of Sombrero Reef	Middle Keys	8/30/99	24	36.357	81	11.129
LVL1 67	West of Sombrero Reef	Middle Keys	8/30/99	24	36.397	81	11.069
LVL1 68	West of Sombrero Reef	Middle Keys	8/30/99	24	36.398	81	11.110
NTZ 53	Sombrero Reef SPA	Middle Keys	9/1/99	24	37.537	81	6.617
NTZ 54	Sombrero Reef SPA	Middle Keys	9/1/99	24	37.535	81	6.638
NTZ 55	Sombrero Reef SPA	Middle Keys	9/1/99	24	37.509	81	6.701
NTZ 56	Sombrero Reef SPA	Middle Keys	9/1/99	24	37.517	81	6.721
NTZ 45	Sombrero Reef SPA	Middle Keys	9/2/99	24	37.523	81	6.644
NTZ 46	Sombrero Reef SPA	Middle Keys	9/2/99	24	37.513	81	6.644
NTZ 47	Sombrero Reef SPA	Middle Keys	9/2/99	24	37.491	81	6.667
NTZ 48	Sombrero Reef SPA	Middle Keys	9/2/99	24	37.493	81	6.679
NTZ 41	Sombrero Reef SPA	Middle Keys	9/2/99	24	37.530	81	6.577
NTZ 42	Sombrero Reef SPA	Middle Keys	9/2/99	24	37.527	81	6.592
NTZ 43	Sombrero Reef SPA	Middle Keys	9/2/99	24	37.523	81	6.601

NTZ 44	Sombrero Reef SPA	Middle Keys	9/2/99	24	37.525	81	6.600
NTZ 49	Sombrero Reef SPA	Middle Keys	8/30/99	24	37.611	81	6.475
NTZ 50	Sombrero Reef SPA	Middle Keys	8/30/99	24	37.595	81	6.495
NTZ 51	Sombrero Reef SPA	Middle Keys	9/1/99	24	37.566	81	6.556
NTZ 52	Sombrero Reef SPA	Middle Keys	9/1/99	24	37.567	81	6.565
LVL1 53	Delta Shoal	Middle Keys	8/15/99	24	37.822	81	5.769
LVL1 54	Delta Shoal	Middle Keys	8/15/99	24	37.850	81	5.709
LVL1 55	Delta Shoal	Middle Keys	8/15/99	24	37.845	81	5.691
LVL1 56	Delta Shoal	Middle Keys	8/15/99	24	37.820	81	5.611
LVL1 117	East of Sombrero Reef	Middle Keys	8/30/99	24	37.929	81	5.384
LVL1 118	East of Sombrero Reef	Middle Keys	8/30/99	24	37.922	81	5.374
LVL1 119	East of Sombrero Reef	Middle Keys	8/30/99	24	37.920	81	5.422
LVL1 120	East of Sombrero Reef	Middle Keys	8/30/99	24	37.925	81	5.413
LVL1 69	South of Coffin's Patch	Middle Keys	9/2/99	24	40.434	80	57.580
LVL1 70	South of Coffin's Patch	Middle Keys	9/2/99	24	40.440	80	57.601
LVL1 71	South of Coffin's Patch	Middle Keys	9/2/99	24	40.420	80	57.609
LVL1 72	South of Coffin's Patch	Middle Keys	9/2/99	24	40.363	80	57.608
LVL1 73	Tennessee Light	Middle Keys	9/3/99	24	44.655	80	46.886
LVL1 74	Tennessee Light	Middle Keys	9/3/99	24	44.662	80	46.895
LVL1 75	Tennessee Light	Middle Keys	9/3/99	24	44.664	80	46.919
LVL1 76	Tennessee Light	Middle Keys	9/3/99	24	44.674	80	46.904
LVL1 77	Tennessee Light	Middle Keys	9/3/99	24	44.568	80	46.885
LVL1 78	Tennessee Light	Middle Keys	9/3/99	24	44.650	80	46.871
LVL1 79	Tennessee Light	Middle Keys	9/3/99	24	44.680	80	46.740
LVL1 80	Tennessee Light	Middle Keys	9/3/99	24	44.684	80	46.722
NTZ 61	Tennessee Reef RO	Middle Keys	9/4/99	24	45.878	80	45.282
NTZ 62	Tennessee Reef RO	Middle Keys	9/4/99	24	45.874	80	45.303
NTZ 63	Tennessee Reef RO	Middle Keys	9/4/99	24	45.832	80	45.345
NTZ 64	Tennessee Reef RO	Middle Keys	9/4/99	24	45.845	80	45.347
NTZ 57	Tennessee Reef RO	Middle Keys	9/4/99	24	45.964	80	45.230
NTZ 58	Tennessee Reef RO	Middle Keys	9/4/99	24	45.940	80	45.202
NTZ 59	Tennessee Reef RO	Middle Keys	9/4/99	24	45.902	80	45.261
NTZ 60	Tennessee Reef RO	Middle Keys	9/4/99	24	45.879	80	45.266
LVL1 81	Northeast of Tennessee Light	Middle Keys	9/3/99	24	46.154	80	44.506
LVL1 82	Northeast of Tennessee Light	Middle Keys	9/3/99	24	46.161	80	44.492
LVL1 83	Northeast of Tennessee Light	Middle Keys	9/3/99	24	46.158	80	44.490
LVL1 84	Northeast of Tennessee Light	Middle Keys	9/3/99	24	46.178	80	44.476
LVL1 85	Between Alligator & Tennessee	Middle Keys	9/11/99	24	47.603	80	41.794
LVL1 86	Between Alligator & Tennessee	Middle Keys	9/11/99	24	47.612	80	41.769
LVL1 87	Between Alligator & Tennessee	Middle Keys	9/11/99	24	47.573	80	41.778
LVL1 88	Between Alligator & Tennessee	Middle Keys	9/11/99	24	47.621	80	41.746
LVL1 89	West of Alligator Light	Middle Keys	9/11/99	24	50.142	80	38.295
LVL1 90	West of Alligator Light	Middle Keys	9/11/99	24	50.147	80	38.282
LVL1 91	West of Alligator Light	Middle Keys	9/11/99	24	50.147	80	38.273
LVL1 92	West of Alligator Light	Middle Keys	9/11/99	24	50.151	80	38.259
NTZ 65	Alligator SPA	Middle Keys	9/11/99	24	50.840	80	37.107
NTZ 66	Alligator SPA	Middle Keys	9/11/99	24	50.860	80	37.089
NTZ 67	Alligator SPA	Middle Keys	9/11/99	24	50.833	80	37.129
NTZ 68	Alligator SPA	Middle Keys	9/11/99	24	50.827	80	37.138
NTZ 69	Alligator SPA	Middle Keys	9/12/99	24	50.909	80	37.001
NTZ 70	Alligator SPA	Middle Keys	9/12/99	24	50.923	80	36.994
NTZ 71	Alligator SPA	Middle Keys	9/12/99	24	50.904	80	37.016
NTZ 72	Alligator SPA	Middle Keys	9/12/99	24	50.890	80	37.031
LVL1 97	Northeast of Alligator Light	Middle Keys	9/12/99	24	52.075	80	34.979
LVL1 98	Northeast of Alligator Light	Middle Keys	9/12/99	24	52.077	80	34.980
LVL1 99	Northeast of Alligator Light	Middle Keys	9/12/99	24	52.140	80	34.884
LVL1 100	Northeast of Alligator Light	Middle Keys	9/12/99	24	52.148	80	34.877

LVL1 109	Crocker Reef	Middle Keys	9/30/99	24	54.275	80	31.799
LVL1 110	Crocker Reef	Middle Keys	9/30/99	24	54.280	80	31.781
LVL1 111	Crocker Reef	Middle Keys	9/30/99	24	54.365	80	31.689
LVL1 112	Crocker Reef	Middle Keys	9/30/99	24	54.365	80	31.678
LVL1 121	Crocker Reef	Middle Keys	9/30/99	24	54.503	80	31.483
LVL1 122	Crocker Reef	Middle Keys	9/30/99	24	54.509	80	31.470
LVL1 123	Crocker Reef	Middle Keys	9/30/99	24	54.450	80	31.511
LVL1 124	Crocker Reef	Middle Keys	9/30/99	24	54.464	80	31.489
LVL1 101	Southwest of Davis Reef	Middle Keys	9/12/99	24	54.455	80	31.537
LVL1 102	Southwest of Davis Reef	Middle Keys	9/12/99	24	54.459	80	31.570
LVL1 103	Southwest of Davis Reef	Middle Keys	9/12/99	24	54.455	80	31.564
LVL1 104	Southwest of Davis Reef	Middle Keys	9/12/99	24	54.462	80	31.546
NTZ 133	Davis Reef SPA	Middle Keys	9/17/99	24	55.298	80	30.399
NTZ 134	Davis Reef SPA	Middle Keys	9/17/99	24	55.298	80	30.418
NTZ 135	Davis Reef SPA	Middle Keys	9/17/99	24	55.266	80	30.408
NTZ 136	Davis Reef SPA	Middle Keys	9/17/99	24	55.250	80	30.412
NTZ 129	Davis Reef SPA	Middle Keys	9/17/99	24	55.342	80	30.284
NTZ 130	Davis Reef SPA	Middle Keys	9/17/99	24	55.357	80	30.272
NTZ 131	Davis Reef SPA	Middle Keys	9/17/99	24	55.312	80	30.346
NTZ 132	Davis Reef SPA	Middle Keys	9/17/99	24	55.302	80	30.371
LVL1 93	Outside of Davis SPA	Middle Keys	9/17/99	24	55.522	80	30.057
LVL1 94	Outside of Davis SPA	Middle Keys	9/17/99	24	55.535	80	30.039
LVL1 95	Outside of Davis SPA	Middle Keys	9/17/99	24	55.592	80	29.932
LVL1 96	Outside of Davis SPA	Middle Keys	9/17/99	24	55.593	80	29.914
LVL1 105	Little Conch Reef	Middle Keys	9/24/99	24	56.320	80	28.648
LVL1 106	Little Conch Reef	Middle Keys	9/24/99	24	56.369	80	28.656
LVL1 107	Little Conch Reef	Middle Keys	9/24/99	24	56.328	80	28.677
LVL1 108	Little Conch Reef	Middle Keys	9/24/99	24	56.320	80	28.659
LVL1 113	Little Conch Reef	Middle Keys	9/23/99	24	56.380	80	28.600
LVL1 114	Little Conch Reef	Middle Keys	9/23/99	24	56.389	80	28.586
LVL1 115	Little Conch Reef	Middle Keys	9/24/99	24	56.447	80	28.495
LVL1 116	Little Conch Reef	Middle Keys	9/24/99	24	56.410	80	28.606
NTZ 73	Conch Reef SPA	Middle Keys	9/18/99	24	57.023	80	27.549
NTZ 74	Conch Reef SPA	Middle Keys	9/18/99	24	57.016	80	27.559
NTZ 75	Conch Reef SPA	Middle Keys	9/18/99	24	57.073	80	27.501
NTZ 76	Conch Reef SPA	Middle Keys	9/18/99	24	57.075	80	27.522
NTZ 77	Conch Reef SPA	Middle Keys	9/18/99	24	57.157	80	27.453
NTZ 78	Conch Reef SPA	Middle Keys	9/18/99	24	57.159	80	27.450
NTZ 79	Conch Reef SPA	Middle Keys	9/18/99	24	57.234	80	27.429
NTZ 80	Conch Reef SPA	Middle Keys	9/18/99	24	57.250	80	27.432

RSMAS strata	Community Type	Depth(ft)
1	Low-relief spur and groove	25-35
1	Low-relief spur and groove	25-35
1	Low-relief spur and groove	25-35
1	Low-relief spur and groove	25-35
1	Low-relief spur and groove	22-28
1	Low-relief spur and groove	25-29
1	Low-relief spur and groove	20-23
1	Low-relief spur and groove	24-28
1	Low-relief spur and groove	31-32
1	Low-relief spur and groove	25-34
1	Low-relief spur and groove	25-35
1	Low-relief spur and groove	26-33
1	Low-relief spur and groove	30-35
1	Low-relief spur and groove	29-33
1	Low-relief spur and groove	32-33
1	Low-relief spur and groove	28-34
1	Low-relief spur and groove	25-32
1	Low-relief spur and groove	31-32
1	Low-relief spur and groove	30-32
1	Low-relief spur and groove	29-32
1	Low-relief spur and groove	30-35
1	Low-relief spur and groove	30-35
1	Low-relief spur and groove	26-34
1	Low-relief spur and groove	27-32
1	Low-relief spur and groove	25-29
1	Low-relief spur and groove	25-28
1	Low-relief spur and groove	25-28
1	Low-relief spur and groove	24-28
1	Low-relief spur and groove	27-28
1	Low-relief spur and groove	24-25
1	Low-relief spur and groove	25-30
1	Low-relief spur and groove	26-31
1	Low-relief spur and groove	27-29
1	Low-relief spur and groove	25-30
1	Low-relief spur and groove	24-27
1	Low-relief spur and groove	27-28
1	Low-relief spur and groove	25-30
1	Low-relief spur and groove	25-30
1	Low-relief spur and groove	26-28
1	Low-relief spur and groove	23-25
1	Low-relief hard-bottom	24-28
1	Low-relief hard-bottom	27-30
1	Low-relief hard-bottom	28-32
1	Low-relief hard-bottom	28-32
1	Low-relief spur and groove	32-33
1	Low-relief spur and groove	29-30
1	Low-relief spur and groove	25-30
1	Low-relief spur and groove	24-28
2	Low-relief hard-bottom	19-22
2	Low-relief hard-bottom	21-24
2	Low-relief hard-bottom	16-21
2	Low-relief hard-bottom	16-19
2	High-relief spur and groove	22-25
2	High-relief spur and groove	18-23
2	High-relief spur and groove	16-19
2	High-relief spur and groove	16-19
1	Low-relief spur and groove	30-33

1	Low-relief spur and groove	30-31
1	Low-relief spur and groove	26-30
1	Low-relief spur and groove	31-33
1	Low-relief spur and groove	30-37
1	Low-relief spur and groove	37-40
1	Low-relief spur and groove	34-36
1	Low-relief spur and groove	35-37
2	High-relief spur and groove	19-26
2	High-relief spur and groove	16-25
2	High-relief spur and groove	20-26
2	High-relief spur and groove	20-27
2	High-relief spur and groove	18-25
2	High-relief spur and groove	20-28
2	High-relief spur and groove	21-25
2	High-relief spur and groove	22-25
3	Offshore patch reef	19-20
3	Offshore patch reef	20-21
3	Offshore patch reef	21-23
3	Offshore patch reef	20-21
3	Offshore patch reef	22-29
3	Offshore patch reef	21-24
3	Offshore patch reef	22-28
3	Offshore patch reef	28-30
3	Offshore patch reef	22-24
3	Offshore patch reef	23-27
3	Offshore patch reef	21-22
3	Offshore patch reef	24-25
3	Offshore patch reef	21-25
3	Offshore patch reef	20-21
3	Offshore patch reef	19-25
3	Offshore patch reef	20-26
1	Patchy low-relief hard-bottom	26-29
1	Patchy low-relief hard-bottom	28-30
1	Low-relief spur and groove	22-26
1	Low-relief spur and groove	27-30
4	Patchy low-relief hard-bottom	30-31
4	Patchy low-relief hard-bottom	25-29
4	Patchy low-relief hard-bottom	26-28
4	Patchy low-relief hard-bottom	27-30
4	Patchy low-relief hard-bottom	24-26
4	Patchy low-relief hard-bottom	25-26
4	Patchy low-relief hard-bottom	30-33
4	Patchy low-relief hard-bottom	30-33
4	Low-relief hard-bottom	29-33
4	Low-relief hard-bottom	28-32
4	Low-relief hard-bottom	27-31
4	Low-relief hard-bottom	27-29
5	High-relief spur and groove	15-22
5	High-relief spur and groove	14-25
5	High-relief spur and groove	17-24
5	High-relief spur and groove	14-22
4	Low-relief spur and groove	24-26
4	Low-relief spur and groove	24-27
4	Low-relief spur and groove	28-31
4	Low-relief spur and groove	27-30
4	Low-relief spur and groove	23-26
4	Low-relief spur and groove	24-28
4	Low-relief spur and groove	26-29

4	Low-relief spur and groove	26-29
5	High-relief spur and groove	15-21
5	High-relief spur and groove	15-21
5	High-relief spur and groove	15-21
5	High-relief spur and groove	9-20
4	Patchy low-relief hard-bottom	25-27
4	Patchy low-relief hard-bottom	25-27
4	Patchy low-relief hard-bottom	27-30
4	Patchy low-relief hard-bottom	27-30
5	Low-relief spur and groove	16-18
5	Low-relief spur and groove	16-20
5	Low-relief spur and groove	15-16
5	Low-relief spur and groove	15-17
4	Low-relief spur and groove	26-30
4	Low-relief spur and groove	24-29
4	Low-relief spur and groove	31-33
4	Low-relief spur and groove	25-29
4	Eroded relict reef flat	28-29
4	Eroded relict reef flat	26-27
4	Eroded relict reef flat	27-28
4	Eroded relict reef flat	26-27
4	Eroded relict reef flat	27-29
4	Eroded relict reef flat	29-31
4	Eroded relict reef flat	27-30
4	Eroded relict reef flat	27-28
4	Low-relief hard-bottom	27-31
4	Low-relief hard-bottom	27-30
4	Low-relief hard-bottom	26-28
4	Low-relief hard-bottom	28-30
4	Low-relief hard-bottom	21-24
4	Low-relief hard-bottom	27-29
4	Low-relief hard-bottom	27-29
4	Low-relief hard-bottom	27-31
4	Low-relief hard-bottom	27-29
4	Low-relief hard-bottom	28-29
4	Low-relief hard-bottom	28-29
4	Low-relief hard-bottom	27-29
4	Low-relief spur and groove	31-33
4	Low-relief spur and groove	30-33
4	Low-relief spur and groove	32-35
4	Low-relief spur and groove	31-34
4	Low-relief hard-bottom	30-32
4	Low-relief hard-bottom	29-31
4	Low-relief hard-bottom	29-31
4	Low-relief hard-bottom	27-31
4	Low-relief spur and groove	28-30
4	Low-relief spur and groove	28-31
4	Low-relief spur and groove	29-31
4	Low-relief spur and groove	29-31
4	Low-relief spur and groove	29-31
4	Low-relief spur and groove	29-32
4	Low-relief spur and groove	28-32
4	Low-relief spur and groove	28-33
4	Low-relief hard-bottom	31-33
4	Low-relief hard-bottom	31-32
4	Low-relief hard-bottom	32-33
4	Low-relief hard-bottom	33-36

6	Patchy low-relief hard-bottom	31-33
6	Patchy low-relief hard-bottom	31-34
6	Patchy low-relief hard-bottom	29-31
6	Patchy low-relief hard-bottom	29-31
6	Patchy low-relief hard-bottom	30-34
6	Patchy low-relief hard-bottom	30-33
6	Patchy low-relief hard-bottom	34-37
6	Patchy low-relief hard-bottom	32-36
4	Patchy low-relief hard-bottom	28-30
4	Patchy low-relief hard-bottom	25-29
4	Patchy low-relief hard-bottom	24-28
4	Patchy low-relief hard-bottom	27-29
4	Low-relief hard-bottom	25-27
4	Low-relief hard-bottom	25-27
4	Low-relief hard-bottom	24-25
4	Low-relief hard-bottom	25-28
4	Low-relief spur and groove	26-30
4	Low-relief hard-bottom	26-29
4	Scattered hard-bottom	26-27
4	Low-relief hard-bottom	25-26
4	Low-relief hard-bottom	26-31
4	Low-relief hard-bottom	25-30
4	Low-relief hard-bottom	29-31
4	Low-relief hard-bottom	28-31
4	Low-relief hard-bottom	29-33
4	Low-relief hard-bottom	29-33
4	Low-relief hard-bottom	29-33
4	Low-relief hard-bottom	29-33
4	Low-relief hard-bottom	29-33
4	Low-relief hard-bottom	29-33
4	Low-relief hard-bottom	29-33
4	Low-relief hard-bottom	29-33
6	Low-relief hard-bottom	31-35
6	Low-relief hard-bottom	31-33
6	Low-relief hard-bottom	29-33
6	Low-relief hard-bottom	28-31
6	Low-relief spur and groove	35-36
6	Low-relief spur and groove	33-36
6	Low-relief spur and groove	32-34
6	Low-relief spur and groove	32-34

Block/Ref #	General Location	Region	Date	Lat (Deg N)	Lat (Min N)	Long (Deg W)	Long (Min W)	Community Type	Depth(ft)
LVL1 1	Western Dry Rocks	Lower Keys	8/5	24	26.707	81	55.693	Low-relief spur and groove	25-35
LVL1 2	Western Dry Rocks	Lower Keys	8/5	24	26.672	81	55.669	Low-relief spur and groove	25-35
LVL1 3	Western Dry Rocks	Lower Keys	8/5	24	26.663	81	55.588	Low-relief spur and groove	25-35
LVL1 4	Western Dry Rocks	Lower Keys	8/5	24	26.669	81	55.669	Low-relief spur and groove	25-35
LVL1 5	Western Dry Rocks	Lower Keys	8/5	24	26.672	81	55.629	Low-relief spur and groove	22-28
LVL1 6	Western Dry Rocks	Lower Keys	8/5	24	26.674	81	55.612	Low-relief spur and groove	25-29
LVL1 7	Western Dry Rocks	Lower Keys	8/6	24	26.741	81	55.514	Low-relief spur and groove	20-23
LVL1 8	Western Dry Rocks	Lower Keys	8/6	24	26.741	81	55.465	Low-relief spur and groove	24-28
NTZ 1	Sand Key SPA	Lower Keys	8/9	24	27.085	81	52.697	Low-relief spur and groove	31-32
NTZ 2	Sand Key SPA	Lower Keys	8/9	24	27.087	81	52.711	Low-relief spur and groove	25-34
NTZ 3	Sand Key SPA	Lower Keys	8/9	24	27.095	81	52.706	Low-relief spur and groove	25-35
NTZ 4	Sand Key SPA	Lower Keys	8/9	24	27.088	81	52.724	Low-relief spur and groove	26-33
NTZ 5	Sand Key SPA	Lower Keys	8/9	24	27.079	81	52.812	Low-relief spur and groove	30-35
NTZ 6	Sand Key SPA	Lower Keys	8/9	24	27.077	81	52.806	Low-relief spur and groove	29-33
NTZ 7	Sand Key SPA	Lower Keys	8/9	24	27.074	81	52.767	Low-relief spur and groove	32-33
NTZ 8	Sand Key SPA	Lower Keys	8/9	24	27.080	81	52.736	Low-relief spur and groove	28-34
NTZ 9	Western Sambo SPA	Lower Keys	8/8	24	28.725	81	43.438	Low-relief spur and groove	25-32
NTZ 10	Western Sambo SPA	Lower Keys	8/8	24	28.717	81	43.400	Low-relief spur and groove	31-32
NTZ 11	Western Sambo SPA	Lower Keys	8/8	24	28.719	81	43.455	Low-relief spur and groove	30-32
NTZ 12	Western Sambo SPA	Lower Keys	8/8	24	28.722	81	43.545	Low-relief spur and groove	29-32
NTZ 13	Western Sambo SPA	Lower Keys	8/8	24	28.712	81	43.126	Low-relief spur and groove	30-35
NTZ 14	Western Sambo SPA	Lower Keys	8/8	24	28.714	81	43.126	Low-relief spur and groove	30-35
NTZ 15	Western Sambo SPA	Lower Keys	8/8	24	28.728	81	43.208	Low-relief spur and groove	26-34
NTZ 16	Western Sambo SPA	Lower Keys	8/8	24	28.728	81	43.122	Low-relief spur and groove	27-32
LVL1 9	Middle Sambo Reef	Lower Keys	8/7	24	29.270	81	40.486	Low-relief spur and groove	25-29
LVL1 10	Middle Sambo Reef	Lower Keys	8/7	24	29.277	81	40.480	Low-relief spur and groove	25-28
LVL1 11	Middle Sambo Reef	Lower Keys	8/7	24	29.296	81	40.423	Low-relief spur and groove	25-28
LVL1 12	Middle Sambo Reef	Lower Keys	8/7	24	29.271	81	40.457	Low-relief spur and groove	24-28
LVL1 13	Middle Sambo Reef	Lower Keys	8/7	24	29.344	81	40.246	Low-relief spur and groove	27-28
LVL1 14	Middle Sambo Reef	Lower Keys	8/7	24	29.330	81	40.270	Low-relief spur and groove	24-25
LVL1 15	Middle Sambo Reef	Lower Keys	8/7	24	29.325	81	40.280	Low-relief spur and groove	25-30
LVL1 16	Middle Sambo Reef	Lower Keys	8/7	24	29.338	81	40.241	Low-relief spur and groove	26-31
NTZ 17	Eastern Sambo SPA	Lower Keys	8/6	24	29.439	81	39.865	Low-relief spur and groove	27-29
NTZ 18	Eastern Sambo SPA	Lower Keys	8/6	24	29.441	81	39.853	Low-relief spur and groove	25-30
NTZ 19	Eastern Sambo SPA	Lower Keys	8/6	24	29.451	81	39.939	Low-relief spur and groove	24-27
NTZ 20	Eastern Sambo SPA	Lower Keys	8/6	24	29.417	81	39.970	Low-relief spur and groove	27-28
NTZ 21	Eastern Sambo SPA	Lower Keys	8/6	24	29.464	81	39.753	Low-relief spur and groove	25-30
NTZ 22	Eastern Sambo SPA	Lower Keys	8/6	24	29.468	81	39.765	Low-relief spur and groove	25-30
NTZ 23	Eastern Sambo SPA	Lower Keys	8/7	24	29.516	81	39.521	Low-relief spur and groove	26-28
NTZ 24	Eastern Sambo SPA	Lower Keys	8/7	24	29.519	81	39.545	Low-relief spur and groove	23-25
LVL1 17	Maryland Shoal	Lower Keys	8/10	24	30.832	81	33.579	Low-relief hard-bottom	24-28
LVL1 19	Maryland Shoal	Lower Keys	8/10	24	30.793	81	33.543	Low-relief hard-bottom	28-32
LVL1 18	Maryland Shoal	Lower Keys	8/10	24	30.801	81	33.547	Low-relief hard-bottom	27-30
LVL1 20	Maryland Shoal	Lower Keys	8/10	24	30.832	81	33.595	Low-relief hard-bottom	28-32
LVL1 21	West of American Shoal	Lower Keys	8/11	24	30.963	81	32.540	Low-relief spur and groove	32-33
LVL1 22	West of American Shoal	Lower Keys	8/11	24	30.982	81	32.541	Low-relief spur and groove	29-30
LVL1 23	West of American Shoal	Lower Keys	8/12	24	30.997	81	32.514	Low-relief spur and groove	25-30
LVL1 24	West of American Shoal	Lower Keys	8/12	24	31.006	81	32.529	Low-relief spur and groove	24-28
LVL1 37	West of American Shoal	Lower Keys	8/11	24	31.165	81	32.564	Low-relief hard-bottom	19-22
LVL1 38	West of American Shoal	Lower Keys	8/11	24	31.135	81	32.443	Low-relief hard-bottom	21-24
LVL1 39	West of American Shoal	Lower Keys	8/12	24	31.174	81	32.537	Low-relief hard-bottom	16-21
LVL1 40	West of American Shoal	Lower Keys	8/12	24	31.182	81	32.516	Low-relief hard-bottom	16-19
LVL1 41	American Shoal	Lower Keys	8/12	24	31.353	81	31.078	High-relief spur and groove	22-25

LVL1 42	American Shoal	Lower Keys	8/12	24	31.357	81	31.089	High-relief spur and groove	18-23
LVL1 43	American Shoal	Lower Keys	8/12	24	31.382	81	31.123	High-relief spur and groove	16-19
LVL1 44	American Shoal	Lower Keys	8/12	24	31.372	81	31.135	High-relief spur and groove	16-19
LVL1 25	American Shoal	Lower Keys	8/11	24	31.358	81	30.793	Low-relief spur and groove	30-33
LVL1 26	American Shoal	Lower Keys	8/11	24	31.354	81	30.811	Low-relief spur and groove	30-31
LVL1 27	American Shoal	Lower Keys	8/11	24	31.366	81	30.770	Low-relief spur and groove	26-30
LVL1 28	American Shoal	Lower Keys	8/11	24	31.364	81	30.794	Low-relief spur and groove	31-33
LVL1 29	Southwestern Looe Key	Lower Keys	8/27	24	32.546	81	24.922	Low-relief spur and groove	30-37
LVL1 30	Southwestern Looe Key	Lower Keys	8/27	24	32.552	81	24.903	Low-relief spur and groove	37-40
LVL1 31	Southwestern Looe Key	Lower Keys	8/27	24	32.552	81	24.900	Low-relief spur and groove	34-36
LVL1 32	Southwestern Looe Key	Lower Keys	8/27	24	32.548	81	24.922	Low-relief spur and groove	35-37
NTZ 29	Looe Key SPA	Lower Keys	8/26	24	32.719	81	24.365	High-relief spur and groove	19-26
NTZ 30	Looe Key SPA	Lower Keys	8/26	24	32.722	81	24.376	High-relief spur and groove	16-25
NTZ 31	Looe Key SPA	Lower Keys	8/26	24	32.709	81	24.422	High-relief spur and groove	20-26
NTZ 32	Looe Key SPA	Lower Keys	8/26	24	32.703	81	24.447	High-relief spur and groove	20-27
NTZ 25	Looe Key SPA	Lower Keys	8/25	24	32.762	81	24.268	High-relief spur and groove	18-25
NTZ 26	Looe Key SPA	Lower Keys	8/25	24	32.736	81	24.243	High-relief spur and groove	20-28
NTZ 27	Looe Key SPA	Lower Keys	8/25	24	32.767	81	24.217	High-relief spur and groove	21-25
NTZ 28	Looe Key SPA	Lower Keys	8/25	24	32.777	81	24.214	High-relief spur and groove	22-25
LVL1 45	Southwest of Looe Key RO	Lower Keys	8/25	24	33.830	81	24.027	Offshore patch reef	19-20
LVL1 46	Southwest of Looe Key RO	Lower Keys	8/25	24	33.786	81	24.019	Offshore patch reef	20-21
LVL1 47	Southwest of Looe Key RO	Lower Keys	8/26	24	33.842	81	23.988	Offshore patch reef	21-23
LVL1 48	Southwest of Looe Key RO	Lower Keys	8/26	24	33.843	81	23.951	Offshore patch reef	20-21
LVL1 49	West of Looe Key RO	Lower Keys	8/26	24	33.842	81	23.814	Offshore patch reef	22-29
LVL1 50	West of Looe Key RO	Lower Keys	8/26	24	33.833	81	23.810	Offshore patch reef	21-24
LVL1 51	West of Looe Key RO	Lower Keys	8/27	24	33.837	81	23.799	Offshore patch reef	22-28
LVL1 52	West of Looe Key RO	Lower Keys	8/27	24	33.831	81	23.799	Offshore patch reef	28-30
NTZ 33	Looe Key Research Only	Lower Keys	8/13	24	33.919	81	23.547	Offshore patch reef	22-24
NTZ 34	Looe Key Research Only	Lower Keys	8/13	24	33.929	81	23.517	Offshore patch reef	23-27
NTZ 35	Looe Key Research Only	Lower Keys	8/24	24	33.928	81	23.534	Offshore patch reef	21-22
NTZ 36	Looe Key Research Only	Lower Keys	8/24	24	33.893	81	23.549	Offshore patch reef	24-25
NTZ 37	Looe Key Research Only	Lower Keys	8/24	24	34.078	81	23.117	Offshore patch reef	21-25
NTZ 38	Looe Key Research Only	Lower Keys	8/24	24	34.078	81	23.124	Offshore patch reef	20-21
NTZ 39	Looe Key Research Only	Lower Keys	8/25	24	34.096	81	23.126	Offshore patch reef	19-25
NTZ 40	Looe Key Research Only	Lower Keys	8/25	24	34.073	81	23.124	Offshore patch reef	20-26
LVL1 33	West of Big Pine Shoal	Lower Keys	8/27	24	33.670	81	20.529	Patchy low-relief hard-bottom	26-29
LVL1 34	West of Big Pine Shoal	Lower Keys	8/27	24	33.666	81	20.517	Patchy low-relief hard-bottom	28-30
LVL1 35	West of Big Pine Shoal	Lower Keys	8/27	24	33.656	81	20.592	Low-relief spur and groove	22-26
LVL1 36	West of Big Pine Shoal	Lower Keys	8/27	24	33.672	81	20.514	Low-relief spur and groove	27-30
LVL1 57	South of Big Pine Key	Middle Keys	8/28	24	35.914	81	12.911	Patchy low-relief hard-bottom	30-31
LVL1 58	South of Big Pine Key	Middle Keys	8/28	24	35.913	81	12.852	Patchy low-relief hard-bottom	25-29
LVL1 59	South of Big Pine Key	Middle Keys	8/28	24	35.930	81	12.940	Patchy low-relief hard-bottom	26-28
LVL1 60	South of Big Pine Key	Middle Keys	8/28	24	35.920	81	12.950	Patchy low-relief hard-bottom	27-30
LVL1 61	Southeast of Big Pine Key	Middle Keys	8/28	24	36.103	81	12.429	Patchy low-relief hard-bottom	24-26
LVL1 62	Southeast of Big Pine Key	Middle Keys	8/28	24	36.083	81	12.412	Patchy low-relief hard-bottom	25-26
LVL1 63	Southeast of Big Pine Key	Middle Keys	8/28	24	36.051	81	12.516	Patchy low-relief hard-bottom	30-33
LVL1 64	Southeast of Big Pine Key	Middle Keys	8/28	24	36.041	81	12.479	Patchy low-relief hard-bottom	30-33
LVL1 65	West of Sombrero Reef	Middle Keys	8/29	24	36.348	81	11.164	Low-relief hard-bottom	29-33
LVL1 66	West of Sombrero Reef	Middle Keys	8/29	24	36.357	81	11.129	Low-relief hard-bottom	28-32
LVL1 67	West of Sombrero Reef	Middle Keys	8/29	24	36.397	81	11.069	Low-relief hard-bottom	27-31
LVL1 68	West of Sombrero Reef	Middle Keys	8/29	24	36.398	81	11.110	Low-relief hard-bottom	27-29
NTZ 53	Sombrero Reef SPA	Middle Keys	8/31	24	37.537	81	6.617	High-relief spur and groove	15-22
NTZ 54	Sombrero Reef SPA	Middle Keys	8/31	24	37.535	81	6.638	High-relief spur and groove	14-25
NTZ 55	Sombrero Reef SPA	Middle Keys	8/31	24	37.509	81	6.701	High-relief spur and groove	17-24

NTZ 56	Sombrero Reef SPA	Middle Keys	8/31	24	37.517	81	6.721	High-relief spur and groove	14-22
NTZ 45	Sombrero Reef SPA	Middle Keys	9/1	24	37.523	81	6.644	Low-relief spur and groove	24-26
NTZ 46	Sombrero Reef SPA	Middle Keys	9/1	24	37.513	81	6.644	Low-relief spur and groove	24-27
NTZ 47	Sombrero Reef SPA	Middle Keys	9/1	24	37.491	81	6.667	Low-relief spur and groove	28-31
NTZ 48	Sombrero Reef SPA	Middle Keys	9/1	24	37.493	81	6.679	Low-relief spur and groove	27-30
NTZ 41	Sombrero Reef SPA	Middle Keys	9/1	24	37.530	81	6.577	Low-relief spur and groove	23-26
NTZ 42	Sombrero Reef SPA	Middle Keys	9/1	24	37.527	81	6.592	Low-relief spur and groove	24-28
NTZ 43	Sombrero Reef SPA	Middle Keys	9/1	24	37.523	81	6.601	Low-relief spur and groove	26-29
NTZ 44	Sombrero Reef SPA	Middle Keys	9/1	24	37.525	81	6.600	Low-relief spur and groove	26-29
NTZ 49	Sombrero Reef SPA	Middle Keys	8/29	24	37.611	81	6.475	High-relief spur and groove	15-21
NTZ 50	Sombrero Reef SPA	Middle Keys	8/29	24	37.595	81	6.495	High-relief spur and groove	15-21
NTZ 51	Sombrero Reef SPA	Middle Keys	8/31	24	37.566	81	6.556	High-relief spur and groove	15-21
NTZ 52	Sombrero Reef SPA	Middle Keys	8/31	24	37.567	81	6.565	High-relief spur and groove	9-20
LVL1 53	Delta Shoal	Middle Keys	8/14	24	37.822	81	5.769	Patchy low-relief hard-bottom	25-27
LVL1 54	Delta Shoal	Middle Keys	8/14	24	37.850	81	5.709	Patchy low-relief hard-bottom	25-27
LVL1 55	Delta Shoal	Middle Keys	8/14	24	37.845	81	5.691	Patchy low-relief hard-bottom	27-30
LVL1 56	Delta Shoal	Middle Keys	8/14	24	37.820	81	5.611	Patchy low-relief hard-bottom	27-30
LVL1 117	East of Sombrero Reef	Middle Keys	8/29	24	37.929	81	5.384	Low-relief spur and groove	16-18
LVL1 118	East of Sombrero Reef	Middle Keys	8/29	24	37.922	81	5.374	Low-relief spur and groove	16-20
LVL1 119	East of Sombrero Reef	Middle Keys	8/29	24	37.920	81	5.422	Low-relief spur and groove	15-16
LVL1 120	East of Sombrero Reef	Middle Keys	8/29	24	37.925	81	5.413	Low-relief spur and groove	15-17
LVL1 69	South of Coffin's Patch	Middle Keys	9/1	24	40.434	80	57.580	Low-relief spur and groove	26-30
LVL1 70	South of Coffin's Patch	Middle Keys	9/1	24	40.440	80	57.601	Low-relief spur and groove	24-29
LVL1 71	South of Coffin's Patch	Middle Keys	9/1	24	40.420	80	57.609	Low-relief spur and groove	31-33
LVL1 72	South of Coffin's Patch	Middle Keys	9/1	24	40.363	80	57.608	Low-relief spur and groove	25-29
LVL1 73	Tennessee Light	Middle Keys	9/2	24	44.655	80	46.886	Eroded relict reef flat	28-29
LVL1 74	Tennessee Light	Middle Keys	9/2	24	44.662	80	46.895	Eroded relict reef flat	26-27
LVL1 75	Tennessee Light	Middle Keys	9/2	24	44.664	80	46.919	Eroded relict reef flat	27-28
LVL1 76	Tennessee Light	Middle Keys	9/2	24	44.674	80	46.904	Eroded relict reef flat	26-27
LVL1 77	Tennessee Light	Middle Keys	9/2	24	44.568	80	46.885	Eroded relict reef flat	27-29
LVL1 78	Tennessee Light	Middle Keys	9/2	24	44.650	80	46.871	Eroded relict reef flat	29-31
LVL1 79	Tennessee Light	Middle Keys	9/2	24	44.680	80	46.740	Eroded relict reef flat	27-30
LVL1 80	Tennessee Light	Middle Keys	9/2	24	44.684	80	46.722	Eroded relict reef flat	27-28
NTZ 61	Tennessee Reef RO	Middle Keys	9/3	24	45.878	80	45.282	Low-relief hard-bottom	27-31
NTZ 62	Tennessee Reef RO	Middle Keys	9/3	24	45.874	80	45.303	Low-relief hard-bottom	27-30
NTZ 63	Tennessee Reef RO	Middle Keys	9/3	24	45.832	80	45.345	Low-relief hard-bottom	26-28
NTZ 64	Tennessee Reef RO	Middle Keys	9/3	24	45.845	80	45.347	Low-relief hard-bottom	28-30
NTZ 57	Tennessee Reef RO	Middle Keys	9/3	24	45.964	80	45.230	Low-relief hard-bottom	21-24
NTZ 58	Tennessee Reef RO	Middle Keys	9/3	24	45.940	80	45.202	Low-relief hard-bottom	27-29
NTZ 59	Tennessee Reef RO	Middle Keys	9/3	24	45.902	80	45.261	Low-relief hard-bottom	27-29
NTZ 60	Tennessee Reef RO	Middle Keys	9/3	24	45.879	80	45.266	Low-relief hard-bottom	27-31
LVL1 81	Northeast of Tennessee Light	Middle Keys	9/2	24	46.154	80	44.506	Low-relief hard-bottom	27-29
LVL1 82	Northeast of Tennessee Light	Middle Keys	9/2	24	46.161	80	44.492	Low-relief hard-bottom	28-29
LVL1 83	Northeast of Tennessee Light	Middle Keys	9/2	24	46.158	80	44.490	Low-relief hard-bottom	28-29
LVL1 84	Northeast of Tennessee Light	Middle Keys	9/2	24	46.178	80	44.476	Low-relief hard-bottom	27-29
LVL1 85	Between Alligator & Tennessee	Middle Keys	9/10	24	47.603	80	41.794	Low-relief spur and groove	31-33
LVL1 86	Between Alligator & Tennessee	Middle Keys	9/10	24	47.612	80	41.769	Low-relief spur and groove	30-33
LVL1 87	Between Alligator & Tennessee	Middle Keys	9/10	24	47.573	80	41.778	Low-relief spur and groove	32-35
LVL1 88	Between Alligator & Tennessee	Middle Keys	9/10	24	47.621	80	41.746	Low-relief spur and groove	31-34
LVL1 89	West of Alligator Light	Middle Keys	9/10	24	50.142	80	38.295	Low-relief hard-bottom	30-32
LVL1 90	West of Alligator Light	Middle Keys	9/10	24	50.147	80	38.282	Low-relief hard-bottom	29-31
LVL1 91	West of Alligator Light	Middle Keys	9/10	24	50.147	80	38.273	Low-relief hard-bottom	29-31
LVL1 92	West of Alligator Light	Middle Keys	9/10	24	50.151	80	38.259	Low-relief hard-bottom	27-31

NTZ 65	Alligator SPA	Middle Keys	9/10	24	50.840	80	37.107	Low-relief spur and groove	28-30
NTZ 66	Alligator SPA	Middle Keys	9/10	24	50.860	80	37.089	Low-relief spur and groove	28-31
NTZ 67	Alligator SPA	Middle Keys	9/10	24	50.833	80	37.129	Low-relief spur and groove	29-31
NTZ 68	Alligator SPA	Middle Keys	9/10	24	50.827	80	37.138	Low-relief spur and groove	29-31
NTZ 69	Alligator SPA	Middle Keys	9/11	24	50.909	80	37.001	Low-relief spur and groove	29-31
NTZ 70	Alligator SPA	Middle Keys	9/11	24	50.923	80	36.994	Low-relief spur and groove	29-32
NTZ 71	Alligator SPA	Middle Keys	9/11	24	50.904	80	37.016	Low-relief spur and groove	28-32
NTZ 72	Alligator SPA	Middle Keys	9/11	24	50.890	80	37.031	Low-relief spur and groove	28-33
LVL1 97	Northeast of Alligator Light	Middle Keys	9/11	24	52.075	80	34.979	Low-relief hard-bottom	31-33
LVL1 98	Northeast of Alligator Light	Middle Keys	9/11	24	52.077	80	34.980	Low-relief hard-bottom	31-32
LVL1 99	Northeast of Alligator Light	Middle Keys	9/11	24	52.140	80	34.884	Low-relief hard-bottom	32-33
LVL1 100	Northeast of Alligator Light	Middle Keys	9/11	24	52.148	80	34.877	Low-relief hard-bottom	33-36
LVL1 109	Crocker Reef	Middle Keys	9/29	24	54.275	80	31.799	Patchy low-relief hard-bottom	31-33
LVL1 110	Crocker Reef	Middle Keys	9/29	24	54.280	80	31.781	Patchy low-relief hard-bottom	31-34
LVL1 111	Crocker Reef	Middle Keys	9/29	24	54.365	80	31.689	Patchy low-relief hard-bottom	29-31
LVL1 112	Crocker Reef	Middle Keys	9/29	24	54.365	80	31.678	Patchy low-relief hard-bottom	29-31
LVL1 121	Crocker Reef	Middle Keys	9/29	24	54.503	80	31.483	Patchy low-relief hard-bottom	30-34
LVL1 122	Crocker Reef	Middle Keys	9/29	24	54.509	80	31.470	Patchy low-relief hard-bottom	30-33
LVL1 123	Crocker Reef	Middle Keys	9/29	24	54.450	80	31.511	Patchy low-relief hard-bottom	34-37
LVL1 124	Crocker Reef	Middle Keys	9/29	24	54.464	80	31.489	Patchy low-relief hard-bottom	32-36
LVL1 101	Southwest of Davis Reef	Middle Keys	9/11	24	54.455	80	31.537	Patchy low-relief hard-bottom	28-30
LVL1 102	Southwest of Davis Reef	Middle Keys	9/11	24	54.459	80	31.570	Patchy low-relief hard-bottom	25-29
LVL1 103	Southwest of Davis Reef	Middle Keys	9/11	24	54.455	80	31.564	Patchy low-relief hard-bottom	24-28
LVL1 104	Southwest of Davis Reef	Middle Keys	9/11	24	54.462	80	31.546	Patchy low-relief hard-bottom	27-29
NTZ 133	Davis Reef SPA	Middle Keys	9/16	24	55.298	80	30.399	Low-relief hard-bottom	25-27
NTZ 134	Davis Reef SPA	Middle Keys	9/16	24	55.298	80	30.418	Low-relief hard-bottom	25-27
NTZ 135	Davis Reef SPA	Middle Keys	9/16	24	55.266	80	30.408	Low-relief hard-bottom	24-25
NTZ 136	Davis Reef SPA	Middle Keys	9/16	24	55.250	80	30.412	Low-relief hard-bottom	25-28
NTZ 129	Davis Reef SPA	Middle Keys	9/16	24	55.342	80	30.284	Low-relief spur and groove	26-30
NTZ 130	Davis Reef SPA	Middle Keys	9/16	24	55.357	80	30.272	Low-relief hard-bottom	26-29
NTZ 131	Davis Reef SPA	Middle Keys	9/16	24	55.312	80	30.346	Scattered hard-bottom	26-27
NTZ 132	Davis Reef SPA	Middle Keys	9/16	24	55.302	80	30.371	Low-relief hard-bottom	25-26
LVL1 93	Outside of Davis SPA	Middle Keys	9/16	24	55.522	80	30.057	Low-relief hard-bottom	26-31
LVL1 94	Outside of Davis SPA	Middle Keys	9/16	24	55.535	80	30.039	Low-relief hard-bottom	25-30
LVL1 95	Outside of Davis SPA	Middle Keys	9/16	24	55.592	80	29.932	Low-relief hard-bottom	29-31
LVL1 96	Outside of Davis SPA	Middle Keys	9/16	24	55.593	80	29.914	Low-relief hard-bottom	28-31
LVL1 105	Little Conch Reef	Middle Keys	9/23	24	56.320	80	28.648	Low-relief hard-bottom	29-33
LVL1 106	Little Conch Reef	Middle Keys	9/23	24	56.369	80	28.656	Low-relief hard-bottom	29-33
LVL1 107	Little Conch Reef	Middle Keys	9/23	24	56.328	80	28.677	Low-relief hard-bottom	29-33
LVL1 108	Little Conch Reef	Middle Keys	9/23	24	56.320	80	28.659	Low-relief hard-bottom	29-33
LVL1 113	Little Conch Reef	Middle Keys	9/22	24	56.380	80	28.600	Low-relief hard-bottom	29-33
LVL1 114	Little Conch Reef	Middle Keys	9/22	24	56.389	80	28.586	Low-relief hard-bottom	29-33
LVL1 115	Little Conch Reef	Middle Keys	9/23	24	56.447	80	28.495	Low-relief hard-bottom	29-33
LVL1 116	Little Conch Reef	Middle Keys	9/23	24	56.410	80	28.606	Low-relief hard-bottom	29-33
NTZ 73	Conch Reef SPA	Middle Keys	9/17	24	57.023	80	27.549	Low-relief hard-bottom	31-35
NTZ 74	Conch Reef SPA	Middle Keys	9/17	24	57.016	80	27.559	Low-relief hard-bottom	31-33
NTZ 75	Conch Reef SPA	Middle Keys	9/17	24	57.073	80	27.501	Low-relief hard-bottom	29-33
NTZ 76	Conch Reef SPA	Middle Keys	9/17	24	57.075	80	27.522	Low-relief hard-bottom	28-31
NTZ 77	Conch Reef SPA	Middle Keys	9/17	24	57.157	80	27.453	Low-relief spur and groove	35-36
NTZ 78	Conch Reef SPA	Middle Keys	9/17	24	57.159	80	27.450	Low-relief spur and groove	33-36
NTZ 79	Conch Reef SPA	Middle Keys	9/17	24	57.234	80	27.429	Low-relief spur and groove	32-34
NTZ 80	Conch Reef SPA	Middle Keys	9/17	24	57.250	80	27.432	Low-relief spur and groove	32-34
NTZ 81	Conch Reef Research Only	Middle Keys	9/29	24	56.994	80	27.310	Low-relief spur and groove	39-41
NTZ 82	Conch Reef Research Only	Middle Keys	9/29	24	57.000	80	27.301	Low-relief spur and groove	39-42

NTZ 83	Conch Reef Research Only	Middle Keys	9/30	24	56.990	80	27.306	Low-relief spur and groove	35-37
NTZ 84	Conch Reef Research Only	Middle Keys	9/30	24	56.979	80	27.323	Low-relief spur and groove	35-36
NTZ 85	Conch Reef Research Only	Middle Keys	9/30	24	57.021	80	27.290	Low-relief spur and groove	39-42
NTZ 86	Conch Reef Research Only	Middle Keys	9/30	24	57.028	80	27.291	Low-relief spur and groove	42-45
NTZ 87	Conch Reef Research Only	Middle Keys	9/30	24	57.021	80	27.283	Low-relief spur and groove	43-46
NTZ 88	Conch Reef Research Only	Middle Keys	9/30	24	57.025	80	27.382	Low-relief spur and groove	44-46
LVL1 129	Northeast of Conch Reef	Middle Keys	9/22	24	56.865	80	27.465	Low-relief spur and groove	36-37
LVL1 130	Northeast of Conch Reef	Middle Keys	9/22	24	56.872	80	27.430	Low-relief spur and groove	36-37
LVL1 131	Northeast of Conch Reef	Middle Keys	9/22	24	56.843	80	27.483	Low-relief spur and groove	35-38
LVL1 132	Northeast of Conch Reef	Middle Keys	9/22	24	56.837	80	27.386	Low-relief spur and groove	37-39
LVL1 125	Northeast of Conch Reef	Middle Keys	9/22	24	56.930	80	27.426	Low-relief spur and groove	36-37
LVL1 126	Northeast of Conch Reef	Middle Keys	9/22	24	56.932	80	27.420	Low-relief spur and groove	36-37
LVL1 127	Northeast of Conch Reef	Middle Keys	9/22	24	56.918	80	27.405	Low-relief spur and groove	35-38
LVL1 128	Northeast of Conch Reef	Middle Keys	9/22	24	56.934	80	27.396	Low-relief spur and groove	37-39
LVL1 133	Southwest of Pickles Reef	Upper Keys	9/30	24	58.038	80	26.777	Low-relief hard-bottom	27-31
LVL1 134	Southwest of Pickles Reef	Upper Keys	9/30	24	58.003	80	26.762	Low-relief hard-bottom	32-35
LVL1 135	Southwest of Pickles Reef	Upper Keys	9/30	24	58.020	80	26.750	Low-relief hard-bottom	31-33
LVL1 136	Southwest of Pickles Reef	Upper Keys	9/30	24	58.015	80	26.779	Low-relief hard-bottom	30-33
LVL1 137	Little Pickles Reef	Upper Keys	10/6	24	58.615	80	25.417	Patchy low-relief hard-bottom	32-34
LVL1 138	Little Pickles Reef	Upper Keys	10/6	24	58.610	80	25.488	Patchy low-relief hard-bottom	25-29
LVL1 139	Little Pickles Reef	Upper Keys	10/6	24	58.599	80	25.490	Patchy low-relief hard-bottom	26-29
LVL1 140	Little Pickles Reef	Upper Keys	10/6	24	58.624	80	25.475	Patchy low-relief hard-bottom	25-28
LVL1 141	Pickles Reef	Upper Keys	10/6	24	58.938	80	25.044	Low-relief spur and groove	31-35
LVL1 142	Pickles Reef	Upper Keys	10/6	24	58.970	80	25.004	Low-relief spur and groove	31-34
LVL1 143	Pickles Reef	Upper Keys	10/6	24	58.926	80	25.086	Low-relief spur and groove	33-34
LVL1 144	Pickles Reef	Upper Keys	10/6	24	58.942	80	25.082	Low-relief spur and groove	32-34
NTZ 97	Molasses Reef SPA	Upper Keys	10/31	25	0.658	80	22.304	Fore reef terrace/buttress zone	26-28
NTZ 98	Molasses Reef SPA	Upper Keys	10/31	25	0.651	80	22.309	Fore reef terrace/buttress zone	26-29
NTZ 99	Molasses Reef SPA	Upper Keys	10/31	25	0.617	80	22.348	Fore reef terrace/buttress zone	27-34
NTZ 100	Molasses Reef SPA	Upper Keys	10/31	25	0.612	80	22.355	Fore reef terrace/buttress zone	26-33
NTZ 109	Molasses Reef SPA	Upper Keys	10/31	25	0.563	80	22.404	Fore reef terrace/buttress zone	26-33
NTZ 110	Molasses Reef SPA	Upper Keys	10/31	25	0.567	80	22.423	Fore reef terrace/buttress zone	28-32
NTZ 111	Molasses Reef SPA	Upper Keys	10/31	25	0.512	80	22.493	Fore reef terrace/buttress zone	28-30
NTZ 112	Molasses Reef SPA	Upper Keys	10/31	25	0.499	80	22.509	Fore reef terrace/buttress zone	28-33
NTZ 101	French Reef SPA	Upper Keys	11/15	25	1.995	80	20.998	Fore reef terrace/buttress zone	22-36
NTZ 102	French Reef SPA	Upper Keys	11/15	25	2.004	80	20.986	Fore reef terrace/buttress zone	24-32
NTZ 103	French Reef SPA	Upper Keys	11/15	25	1.941	80	21.005	Fore reef terrace/buttress zone	27-34
NTZ 104	French Reef SPA	Upper Keys	11/15	25	1.951	80	20.992	Fore reef terrace/buttress zone	29-34
NTZ 105	French Reef SPA	Upper Keys	11/15	25	2.191	80	20.764	Fore reef terrace/buttress zone	28-33
NTZ 106	French Reef SPA	Upper Keys	11/15	25	2.184	80	20.746	Fore reef terrace/buttress zone	25-34
NTZ 107	French Reef SPA	Upper Keys	11/15	25	2.155	80	20.786	Fore reef terrace/buttress zone	27-40
NTZ 108	French Reef SPA	Upper Keys	11/15	25	2.211	80	20.779	Fore reef terrace/buttress zone	27-33
LVL1 169	Dixie Shoal	Upper Keys	11/15	25	3.716	80	19.502	Low-relief hard-bottom	33-36
LVL1 170	Dixie Shoal	Upper Keys	11/15	25	3.713	80	19.476	Low-relief hard-bottom	33-37
LVL1 171	Dixie Shoal	Upper Keys	12/7	25	3.724	80	19.521	Low-relief hard-bottom	29-32
LVL1 172	Dixie Shoal	Upper Keys	12/7	25	3.730	80	19.517	Low-relief hard-bottom	29-32
LVL1 173	Dixie Shoal	Upper Keys	12/7	25	4.138	80	19.205	Low-relief hard-bottom	25-28
LVL1 174	Dixie Shoal	Upper Keys	12/7	25	4.144	80	19.195	Low-relief hard-bottom	27-28
LVL1 175	Dixie Shoal	Upper Keys	12/7	25	4.175	80	19.172	Low-relief hard-bottom	28-34
LVL1 176	Dixie Shoal	Upper Keys	12/7	25	4.166	80	19.180	Low-relief hard-bottom	25-32
NTZ 89	Grecian Rocks SPA	Upper Keys	12/5	25	6.624	80	18.216	Inner spur and groove	9-21
NTZ 90	Grecian Rocks SPA	Upper Keys	12/5	25	6.595	80	18.225	Inner spur and groove	11-24
NTZ 91	Grecian Rocks SPA	Upper Keys	12/5	25	6.723	80	18.157	Inner spur and groove	14-29
NTZ 92	Grecian Rocks SPA	Upper Keys	12/5	25	6.696	80	18.178	Inner spur and groove	11-25

NTZ 93	Grecian Rocks SPA	Upper Keys	12/5	25	6.514	80	18.315	Inner spur and groove	16-20
NTZ 94	Grecian Rocks SPA	Upper Keys	12/5	25	6.418	80	18.339	Inner spur and groove	15-19
NTZ 95	Grecian Rocks SPA	Upper Keys	12/5	25	6.466	80	18.357	Inner spur and groove	15-20
NTZ 96	Grecian Rocks SPA	Upper Keys	12/5	25	6.512	80	18.374	Inner spur and groove	11-18
LVL1 177	Litte Grecian Rocks	Upper Keys	12/6	25	7.089	80	18.003	Inner spur and groove	23-24
LVL1 178	Litte Grecian Rocks	Upper Keys	12/6	25	7.100	80	18.007	Inner spur and groove	17-25
LVL1 179	Litte Grecian Rocks	Upper Keys	12/6	25	7.129	80	18.008	Inner spur and groove	13-26
LVL1 180	Litte Grecian Rocks	Upper Keys	12/6	25	7.137	80	18.006	Inner spur and groove	13-25
LVL1 181	North-North Dry Rocks	Upper Keys	12/6	25	8.168	80	17.392	Inner spur and groove	12-22
LVL1 182	North-North Dry Rocks	Upper Keys	12/6	25	8.177	80	17.375	Inner spur and groove	14-25
LVL1 183	North-North Dry Rocks	Upper Keys	12/6	25	8.185	80	17.356	Inner spur and groove	19-29
LVL1 184	North-North Dry Rocks	Upper Keys	12/6	25	8.193	80	17.354	Inner spur and groove	15-29
LVL1 153	South of Elbow Reef SPA	Upper Keys	12/10	25	8.211	80	15.784	High-relief spur and groove	24-27
LVL1 154	South of Elbow Reef SPA	Upper Keys	12/10	25	8.198	80	15.791	High-relief spur and groove	23-26
LVL1 155	South of Elbow Reef SPA	Upper Keys	12/11	25	8.238	80	15.720	High-relief spur and groove	21-25
LVL1 156	South of Elbow Reef SPA	Upper Keys	12/11	25	8.252	80	15.705	High-relief spur and groove	23-26
NTZ 121	Elbow Reef SPA	Upper Keys	12/10	25	8.299	80	15.688	High-relief spur and groove	16-19
NTZ 122	Elbow Reef SPA	Upper Keys	12/10	25	8.297	80	15.700	High-relief spur and groove	21-23
NTZ 123	Elbow Reef SPA	Upper Keys	12/10	25	8.280	80	15.733	High-relief spur and groove	19-21
NTZ 124	Elbow Reef SPA	Upper Keys	12/10	25	8.271	80	15.736	High-relief spur and groove	22-23
NTZ 125	Elbow Reef SPA	Upper Keys	12/10	25	8.423	80	15.529	High-relief spur and groove	24-25
NTZ 126	Elbow Reef SPA	Upper Keys	12/10	25	8.447	80	15.513	High-relief spur and groove	22-23
NTZ 127	Elbow Reef SPA	Upper Keys	12/10	25	8.384	80	15.600	High-relief spur and groove	15-23
NTZ 128	Elbow Reef SPA	Upper Keys	12/10	25	8.392	80	15.594	High-relief spur and groove	13-22
LVL1 145	South of Carysfort SPA	Upper Keys	12/13	25	11.902	80	13.449	Low-relief hard-bottom	26-31
LVL1 146	South of Carysfort SPA	Upper Keys	12/13	25	11.891	80	13.451	Low-relief hard-bottom	30-32
LVL1 147	South of Carysfort SPA	Upper Keys	12/13	25	11.890	80	13.472	Low-relief hard-bottom	24-29
LVL1 148	South of Carysfort SPA	Upper Keys	12/13	25	11.886	80	13.469	Low-relief hard-bottom	25-29
LVL1 149	South of Carysfort SPA	Upper Keys	12/13	25	11.935	80	13.399	Low-relief hard-bottom	34-36
LVL1 150	South of Carysfort SPA	Upper Keys	12/13	25	11.945	80	13.394	Low-relief hard-bottom	36-37
LVL1 151	South of Carysfort SPA	Upper Keys	12/13	25	11.978	80	13.366	Low-relief hard-bottom	37-38
LVL1 152	South of Carysfort SPA	Upper Keys	12/13	25	11.988	80	13.356	Low-relief hard-bottom	34-37
NTZ 113	Carysfort/S. Carysfort SPA	Upper Keys	12/14	25	13.451	80	12.483	Low-relief hard-bottom	24-33
NTZ 114	Carysfort/S. Carysfort SPA	Upper Keys	12/14	25	13.447	80	12.485	Low-relief hard-bottom	24-35
NTZ 115	Carysfort/S. Carysfort SPA	Upper Keys	12/14	25	13.428	80	12.498	Low-relief hard-bottom	26-36
NTZ 116	Carysfort/S. Carysfort SPA	Upper Keys	12/14	25	13.414	80	12.506	Low-relief hard-bottom	26-35
NTZ 117	Carysfort/S. Carysfort SPA	Upper Keys	12/14	25	13.546	80	12.432	Low-relief hard-bottom	26-32
NTZ 118	Carysfort/S. Carysfort SPA	Upper Keys	12/14	25	13.548	80	12.428	Low-relief hard-bottom	24-32
NTZ 199	Carysfort/S. Carysfort SPA	Upper Keys	12/14	25	13.601	80	12.412	Low-relief hard-bottom	25-33
NTZ 120	Carysfort/S. Carysfort SPA	Upper Keys	12/14	25	13.604	80	12.402	Low-relief hard-bottom	23-32
LVL1 157	North of Carysfort SPA	Upper Keys	12/13	25	14.653	80	11.841	Shallow-hard-bottom	21-23
LVL1 158	North of Carysfort SPA	Upper Keys	12/13	25	14.667	80	11.836	Shallow-hard-bottom	20-22
LVL1 159	North of Carysfort SPA	Upper Keys	12/13	25	14.711	80	11.815	Shallow-hard-bottom	19-20
LVL1 160	North of Carysfort SPA	Upper Keys	12/13	25	14.724	80	11.811	Shallow-hard-bottom	20-21
LVL1 161	North of Carysfort SPA	Upper Keys	12/8	25	14.814	80	11.762	Low-relief spur and groove	25-27
LVL1 162	North of Carysfort SPA	Upper Keys	12/8	25	14.823	80	11.747	Low-relief spur and groove	27-29
LVL1 163	North of Carysfort SPA	Upper Keys	12/8	25	14.870	80	11.712	Low-relief spur and groove	27-34
LVL1 164	North of Carysfort SPA	Upper Keys	12/8	25	14.864	80	11.703	Low-relief spur and groove	26-34
LVL1 165	North of Carysfort SPA	Upper Keys	12/14	25	14.848	80	11.703	Low-relief spur and groove	29-34
LVL1 166	North of Carysfort SPA	Upper Keys	12/14	25	14.862	80	11.728	Low-relief spur and groove	25-31
LVL1 167	North of Carysfort SPA	Upper Keys	12/14	25	14.899	80	11.717	Low-relief spur and groove	25-28
LVL1 168	North of Carysfort SPA	Upper Keys	12/14	25	14.901	80	11.703	Low-relief spur and groove	27-31

Site notes
All four sites: Dominated by *Dictyota* , fine turf and gorgonians
Coral colonies small with a few medium/large colonies scattered
Sand grooves range from 1.5-8 m wide; spur height up to 1 m not exceeding 1.5 m
Vertical relief up to 2.5 m in isolated locations, but generally less than 0.5m
Similar to LVL1 REF 1-4
Sand grooves less than 1-m wide to approximately 5-m wide
Mostly small corals, some scattered medium to large coral heads
Spurs 0.5-0.8 m in height, sand grooves greater than 1-m in width, *Acropora* coral substrate
Similar to first site, relief generally less than 0.5 m except for isolated *M. faveolata* heads
Scattered small coral colonies, some staghorn coral rubble, sand grooves 0.5-3 m wide
All four sites: turf algae, *Dictyota* and sea plumes dominant, some evidence of Georges
All four sites similar to first block, turf and *Dictyota* dominant, complexity higher
Spurs 0.5-0.8 m high and 4.5-7 m wide, grooves about 1-m wide
Dictyota and turf dominated spurs, abundant cervicornis rubble, spurs 0.5-0.8 m high
Spurs less continuous, western edge of reserve, cyanobacteria more abundant, few corals
Large patchesof cervicornis rubble, same habitat type as first two sites
Some cemented cervicornis rubble, medium to large *M. faveolata* , abundant silt/sand
Higher relief spurs than first block, spurs 1-1.5 m high, grooves 1-1.5 m wide
All sites dominated by turf algae and *Dictyota* , isolated *Montastraea* colonies
Coralline spurs 0.5-0.8 m high and grooves 2-4 m wide
Same habitat type, frequent patches of *M. mirabilis* among cervicornis rubble
Dominated by *Dictyota* spp .and fine turf.; abundant *A. cervicornis* rubble
Scattered massive coral *M. faveolata* colonies; small and medium size colonies scattered
Juvenile corals frequent; spur height approx 0.5 m, sand grooves possibly excavated by Hurricane Georges
Large areas of sand over hard bottom
Substrate consists of cervicornis rubble, similar to first block, CCA abundant on rubble
Some rubble well cemented, coral cover very low and similar to first site
Spur height usually less than 1 m, *Dictyota* and fine turf dominant
Scattered massive corals, most small to medium in size, same algal dominance patterns
Dominated by *Dictyota* and fine turf; abundant *cervicornis* rubble-some cemented, some loose
Scattered medium sized coral colonies
Maximum vertical relief between 0.5-1 m; sand grooves greater than or equal to 1-m wide
Dictyota dominant; abundant *cervicornis* rubble; coral cover low with small to medium corals
Sparsely scattered large colonies of *M. faveolata* and medium colonies of M. cavernosa
Sand grooves 1-4.5 m wide, sand excavated (H. Georges) in many of the grooves
Spur height approximately 0.5-1 m from sand groove
Low-relief with patches of sand and rubble, *Dictyota* and gorgonian dominated, relief < 0.5 m
Some isolated corals, many tall (0.5+ m) gorgonians, more fine turf tban first site
Dictyota and turf dominated, sparse and scattered *Montastraea* colonies
Same habitat
Grooves 1-1.2 m wide, spurs 0.8-1 m above sand and 2-2,5 m wide
More rubble and lower profile, dominated by algal turf and gorgonians
Spurs 0.5-0.9 m high and 3-5 m wide, grooves 0.5-2 m wide, *Dictyota* and turf dominant
Scattered medium to large corals, spurs 0.5-0.8 m high and 5-11 m wide
Relief less than 0.5 m, isolated colonies of *Diploria*
More rubble and scattered hard bottom
Shallow linear shoal, fine turf dominant, coral cover and topographic complexity low
More rubble, turf dominant, more sediment trapped on surface by algae
All four sites: relatively high-profile spur and groove, but less so than at Looe Key

Fine and thick turf and CCA dominant benthos, few large corals
Dictyota less abundant than in deeper, low-relief spur and groove
All four sites: very low profile spur and groove; turf, *Dictyota* and gorgonians dominant
Spurs oriented N-S and 3-3.5 m wide, grooves 1-1.5 m wide, spurs 0.5 m above sand
Vertical relief up to 0.5 m, isolated *S. bournoni* and *X. muta* provide greatest relief
Most corals small in size, silty bottom with abundant fine and thick turf
All four sites characterized as low-relief spur and groove, vertical relief less tnan 1 m
Spurs < 1 m above grooves, Pleistocene basement rock exposed in some groove areas
Grooves mostly 1-m wide, sediment depth < 20 cm, spurs mostly 3.5-4 m wide
Visually dominated by turf, *Dictyota* and octocorals, few small coral heads
All four sites: physically similar to first block in complexity and spur and groove formation
More massive coral heads, most *M. favolata* and *C. natans*, *Dictyota* and turf dominant
Vertical relief up to 3 m, more *Dictyota* and thick turf than first block
Grooves 4-5 m wide, some *A. palmata* stands, *Palythoa* abundant
All four sites: high relief, spurs oriented roughly N-S, grooves 3.5-4.5 m wide
Turf algae, *Palythoa* and *Montastraea* dominant; relief up to 2.5 m near coral heads
Sand grooves 5-m wide, spurs 5-10 m wide, many medium-size corals
Some evidence of Hurricane Georges damage, scattered dead corals and overtoppled colonies
All four sites: patch reef complex WSW of RO area, lower relief, fewer large coral heads
More rubble, large gorgonians dominant, *Dictyota* and fine turf dominant benthos
Corals small to medium in size, very silty bottom with tufts of *Ceramium*
All four sites similar to first block, loosely consolidated patch reef, very silty
Few large coral heads, some *C. natans*, *S. siderea* and *M. cavernosa*
Turf, *Dicyota* and silt dominant
Abundant small to medium size corals, but also gorgonians and sponges
All four sites: large patch reef area, algae dominant, particularly filamentous red algae and turf
Fine turf with silt abundant, substrate is fragmented reef rock, numerous holes and crevices
Primary corals are *M. cavernosa*, *C. natans* and *S. siderea*; *Montastraea* spp. less abundant
Abundant and large gorgonians, relief up to 1.5 m, particularly on *C. natans* colonies
Similar to first block, visibility poor and bottom very silty; relief up to 1.5 m
S. siderea, *C. natans* and *M. cavernosa* dominant corals, some up to 1-m in diameter
Many gorgonians up to 1-m high, many patches of Palythoa up to 1-m in diameter
Very low profile and sandy hard-bottom, relief < 1 m, grooves 3.5-4 m wide when present
Patchy hard-bottom dominated by turf, *Halimeda* and cyanobacteria, small corals
Higher sediment coverage, sand grooves < 1 m wide, turf and *Dictyota* dominant
Same habitat as third site
All four sites: algal-dominated hard-bottom with patches of sand and rubble, relief < 0.5 m
Turf, *Sargassum*, *Cladophoropsis*, *Lobophora*, *Penicillus* and cyanobacteria dominant benthos
Appears to be relict linear shoal or back reef area, fractured substrate in some places
Very low coral cover and mostly small colonies
Algal-dominated hard-bottom, more diverse than LVL1 57-60, but relief very low
Turf, *Sargassum*, *Dictyota* and *Halimeda* abundant
Numerous places where sediment has been trapped by mat-forming cyanobacteria
Most corals small and sparse in abundance; greatest relief provided by Florida loggerhead sponges
Patchy hard-bottom dominated by turf algae, *Caulerpa*, *Halimeda*, *Sargassum* and *Cladophoropsis*
Gorgonians and sponges sparse in abundance, corals sparse and small in size
Many places where sediment has been trapped by mat-forming cyanobacteria
Relief less than 0.5 m
Similar to first block, but more coral heads, particularly *M. favolata* and *C. natans*
Grooves as wide as 6 m and spurs up to 5 m wide, less relief on spur tops
Further west of first two sites, almost due south of lighthouse; isolated and small stands of *A. palmata*

Further west of first two sites, almost due south of lighthouse; isolated and small stands of *A. palmata*
Turf algae and gorgonians dominant, particularly large sea plumes and plexaurids
Isolated *S. bournoni*, *S. vesparium*, *X. muta*, *I campana* and *G. neptuna*
North of survey sites is a cobble/rubble area with sparse lifeform coverage/scattered gorgonians
Patchier and more barren than second site
Large patches of sand, some poorly formed spurs, visually dominated by algae and gorgonians, relief < 0.5 m
Some medium size coral heads, relief slightly greater and less sand coverage
Similar to second site, more defined spurs, sand in grooves < 10 cm and more small, isolated coral heads
Low-profile spurs 2-3 m wide and closely spaced (< 3 m), sand in grooves 7-10 cm deep; large *S. vesparium*
Base of spur and groove at 6-7 m, spurs oriented 150/330 and up to 2.5 m of vertical relief
Spurs up to 4.5-5 m wide, but as narrow as 2 m; very few coral recruits
Spur surfaces dominated by turf algae, CCA, *Dictyota* and *Palythoa*; very few large corals or gorgonians
Most octocorals > 30 cm in height and most sponges are encrusting
Large patches of sand and rubble, fine turf and gorgonians dominant, relief < 0.5 m
More relief and *Dictyota* coverage than first site, up to 80 cm, numerous places with fractured substratum
Similar habitat to first two sites, corals very sparse and mostly represented by *Millepora*
Sparse hard-bottom, fine turf dominant benthos, large patches of sand, isolated *S. vesparium* and *X. muta*
Shallow reference site for Sombrero SPA, some spur and groove formations, but mostly low-relief hard-bottom
Turf algae, cyanobacteria and *Dictyota* dominant benthos, relief generally < 1 m, but many ledges and sand holes
Small to medium size corals scattered throughout site
Sediment on spurs is coarse and not silty
Spurs 6.5 m wide and < 0.5 above sand; mostly covered with turf and sand, relief < 1 m
Few macroalgae, but some small patches of *H. goreauii*; sand grooves narrow (< 2 m)
Conspicuous fauna include *S. vesparium*, *S. bournoni*, *A. compressa*, *I. birotulata*, *I. strobilina* and *I. campana*
Small coral heads scattered, represented by *D. stokesi* and *S. siderea*
Eroded, rubble version of relict reef flat, possible reference area for northern relict reef flats
Turf, cyanobacteria and *Dictyota* dominant benthos; sea plumes most abundant sessile invertebrate
Similar habitat type found at all four sites; patches of reef < 0.5 m above sand
Large and frequent patches of *C. verticillata*, with abundant gorgonians and sponges
Similar habitat type as first block, almost due south of lighthouse
Patchier than first block, patches < 0.5 m above sand
Very low coral cover and represented by small colonies of *P. astreoides*, *S. siderea* and *D. stokesi*
Millepora alcicornis very abundant and dominant coral species
Northeast of first block, lower profile and slightly more downslope
Dictyota and gorgonians dominant, relief mostly < 0.5 m
More sandy patches at sites 3 and 4
Some scattered corals and sponges such as *M. meandrites*, *D. stokesi*, *S. bournoni*, *I. strobilina* and *X. muta*
Very similar to area near lighthouse, but with more relief and less rubble, *G. ventalina* and *P. americana* abundant
Some mid-size (20-50 cm) corals represented by *D. strigosa*, *S. bournoni*, *S. siderea* and *C. natans*
Larger sand patches than at first two sites and some larger coral heads
Larger sand patches than at first two sites and some larger coral heads
Due south of sand plain off Lower Matecumbe Key, algal and octocoral dominated with sand/rubble patches
All sites at northern edge of hard-bottom area, some scattered, medium size (20-40 cm) corals
Generally looks like shallow Davis Reef without the landward ledge
Similar to LVL1 73-80, but hard-bottom much more consolidated/continuous
Szpur and groove and rocky outcrops with large patches of sand at first two sites; relief < 0.5 m
Up to 2 cm of sediment on bottom; several large mats of *C. verticillata*
Isolated *S. vesparium*, *I. campan* a and *I. strobilina*; only small (< 30 cm) corals
Spurs up to 21 m long, 1.5-2 m wide and < 20 cm off sand; mostly turf algae present, but some cyanobacteria
Low-relief hard-bottom and some areas of poorly defined low-relief spur and groove
Spurs more defined below 10-m depth; greatest relief provided by large *S. vesparium* sponges
Algal turf, *Sargassum* and *C. verticillata* dominant benthos; coral cover very low and represented by small colonies
More defined spurs at third and fourth sites, approximately 1-m wide and < 1 m above grooves

Spurs approximately 1-m apart and up to 0.5 m above sand grooves
Turf, *H. tuna* , *C. macromeres* and *Sargassum* dominant benthos
Some isolated *X. muta* , *I. strobilina* and *S. vesparium*
Very few corals; sediment on spurs very silty
Some patches of sand interspersed with hard-bottom; relief < 1 m and grooves 1.5-2 m wide
Dominant benthos are turf algae, *H. tuna* , *Sargassum* and *C. macromeres*
East of block is a large sand plain
Spurs 2.5-3 m wide and up to 0.5 m above grooves; spurs oriented 120/300 or NW-SE
Sparse hard-bottom and very silty; very sparse invertebrate coverage; mostly turf and Caulerpa
P. americana dominant invertebrate, but most colonies < 10 cm in height; most 4-6 cm in height
Sparse site with more sand; abundant *Penicillus* , *H. tuna* , *Lobophora* and *Sargassum* ; relief < 0.5 m
Scattered hard-bottom and remnant spur and groove; spurs 2-3 m wide and up to 25 m long
Fine turf dominant, but macroalgal cover very low; sea plumes most abundant invertebrate
Corals and sponges mostly represented by recent recruits; some small colonies of *S. bournoni* and *C. natans*
Third and fourth sites northeast of first block; more continuous hard-bottom with some large *X. muta*
Similar to first block, relief < 0.5 m with turf and gorgonians dominant; most gorgonians < 15 cm in height
Macroalgal cover very low and very few larger corals; more relief than first site
More patchy hard-bottom with some large *X. muta* and *S. vesparium* ; no large coral heads
Some large *S. vesparium* , *I. strobilina* and *I. campana* sponges, but fewer gorgonians
Patchy hard-bottom with variable expanses of sand; relief < 0.5 m
Invertebrate density low; no large coral heads at first site, but greater relief at second site
Greatest relief represented by *X. muta* ; site is very scoured and mostly covered with fine turf
At roughly 7-8 m, the block looks like shallow Davis Reef; no organized spur and groove development
First two sites due south of red marker along mooring buoy line; relief up to 1 m
Turf algae, *Dictyota* and CCA dominant benthos; high structural complexity, but patchy hard-bottom
Edge of ridge along landward edge of relict reef flat; more Dictyotya and fewer macroinvertebrates
Similar habitat to third site
Mostly turf algae; macroalgal cover low; isolated 1-m *M. meandrites* ; sea plumes dominant; relief up to 1.5 m
More continuous hard-bottom due north of first site
Bounded to the east by a large sand plain; more scattered hard-bottom
Near mooring buoy, just south of ledge at Davis Reef
Looks similar to Conch Reef; turf and *Dictyota* dominant; maximum relief of 1-m, but generally < 0.5 m
Sea plumes dominant benthic invertebrate; some small patches of sand and rubble
Similar to second site, but relief up to 1 m; many small ledges and isolated corals
Similar to third site with isolated corals such as *S. bournoni* , *S. siderea* and *M. meandrites*
Similar to LVL1 113-116, turf and *Dicyota* dominant, very few large gorgonians and mostly < 10 cm tall
Sand grooves roughly 1-m wide and not well defined; relief generally below 0.5 m
Same habitat type as first two sites; spurs roughly 1 m above sand and 4-4.5 m wide
Rare and isolated dead *M. faveolata* colonies provide greatest relief
Poorly defined, low-relief spur and groove; turf algae and Dictyota dominant; spurs up to 1 m from sand
Similar habitat; isolated and rare M. faveolata colonies; X. muta provides greatest relief (1 m)
Spurs at least 5-m wide and 40-60 cm above sand
Lower profile overall, but some small ledges; possibly impacted by Georges based on small gorgonian colonies
Turf and *Dictyota* dominant, sea plumes most abundant invertebrate; several patches of cyanobacteria
Greatest relief (0.7 m) represented by *X. muta* ; dome isolated corals such as *Diploria* , *Meandrina* and *Solenastrea*
Isolated and sparse *M. faveolata* heads, some mostly dead
H. tuna more prevalent
Similar to first block, but defined low-relief spur and groove formations
Fewer invertebrates and lower relief than first block; no large coral heads
Turf algae, *Dictyota* and *H. tuna* most abundant bottom types
Dominated by turf and *Dictyota* , relief up to 1-m and represented by X. muta, may be erosional spur and groove
Few large coral heads, but relief generally < 0.5 m, spurs more prevalent below 12 m depth, < 1 m spacing

Spurs mostly 3-4 m wide, some isolated but mostly dead *M. faveolata*
Less *Dictyota* coverage at third and fourth sites, more *M. faveolata* heads up to 1.5 m high
Spurs 3.5-4 m wide and 25-50 m long, grooves 0.5-1 m wide; turf, Dictyota and Lobophora dominant
Spurs 40-60 cm above sand, relief up to 1.5 m, mostly near alive and dead M. faveolata heads
Several large (30-50 cm) sponges such as *X. muta*, *P. crassa*, *A. schmidti*, *V. gigantea* and *E. ferox*
Some mid-size (20-40 cm) corals and most gorgonians > 20 cm tall
Higher relief than LVL1 125-128 and just north of ledge
Lower profile than first site, but still dominated by turf algae, *Dictyota*, *H. goreauii* and *A. tribulus*
Isolated and mostly dead *M. faveolata* heads, relief up to 1.5 m
Same habitat type as previous three sites
Turf and *Dictyota* dominant; sea plumes most abundant invertebrate; grooves < 1 m wide
Greatest relief (0.6-0.7 m) represented by X. muta; spurs 40-50 cm above sand, very wide and oriented 150/330
Spurs better defined at third and fourth sites, 3-5 m wide, sand up to 5 cm deep in grooves
Some isolated alive and dead *M. faveolata* heads, relief up to 1.5 m; some *H. goreauii* and cyanobacteria mats
Patches of sand and rubble, turf dominant, *Dictyota* and gorgonians abundant, mostly small
South of first site, same habitat type, some larger sand patches, vertical relief < 0.5 m
Same habitat type, few larger invertebrates, some 20-cm diameter corals
Same habitat type, isolated dead *M. faveolata* (2-m in height)
Relief < 0.5 m, very low coral cover, isolated X. muta provide greatest relief
Due west of first site, more continuous hard-bottom, *Dictyota* more prevalent
Less consolidated hard-bottom, turf algae and *Dictyota* dominant
North of third site and same habitat type
Dominated by turf algae and gorgonians, spurs 2.5 m wide, 0.5-1 m apart, 70 cm from sand
Macroalgal cover low, greatest relief (0.5 m) represented by *X. muta* and *S. vesparium*
Some mid-size (20-40 cm) corals and many small recruits of *P. americana*
Appears very wave swept, looks like SW Looe Key
Relief up to 1.5 m, turf and *Dictyota* dominant, sea plumes very abundant, large coral heads
Due west of first site, same habitat type at edge of terrace zone
One-third of transect (eastern end) in lower profile hard-bottom seaward of terrace
West of first site; site locations roughly 120/310 from tower at Molasses Reef
All four sites: similar to first block, but more and larger *M. faveolata*, relief up to 2 m
Some coral heads up to 3 m in diameter, turf and *Dictyota* dominant
All sites southeast of Molasses tower, sea plumes dominant invertebrate
Eastern end of transects ends in abrupt ledge with 1-m of vertical relief
Seaward end of spur and groove and terrace, fine turf, *Dictyota* and CCA dominant
More defined spur and groove, thickets of cervicornis present, spurs up to 3-m high
Southwestern corner of SPA, edge of terrace, more *Dictyota* and fewer coral heads
Southwestern corner of SPA, edge of terrace, more *Dictyota* and fewer coral heads
Similar to first block, turf and *Dictyota* dominant, isolated and dead *M. faveolata*
Same habitat type, part of spur and groove structure
Seaward of spur and groove, fine turf, sand on hard-bottom and *Dictyota* dominant
Relief up to 1-m, but generally < 0.5 m on top of terrace
Abundant microtopography, small patches of sand and rubble, turf and *Dictyota* dominant
Same habitat type, many small patches of orange tunicates, isolated small coral colonies
More continuous hard-bottom, turf and *Dictyota* dominant, gorgonians very abundant
Larger patches of sand and rubble, corals sparse and sponges small
Second block further north, same habitat type, *Dictyota*, fine turf and gorgonians dominant
Larger patches of rubble and sand
Same habitat type, slightly deeper, relief up to 50 cm and represented by *X. muta*, less *Dictyota*
Same habitat type, slightly deeper, relief up to 50 cm and represented by *X. muta*, less *Dictyota*
All four sites: near mooring buoy 12, base of spur and groove/rubble zone, dead A. palmata framework
Turf, *Dictyota* and CCA dominant benthos, but also *G. ventalina*, *Palythoa*, *P. astreoides* and *P. americana*
Isolated medium size corals such as *M. cavernosa*, *M. faveolata* and *S. siderea*
Microtopography significant, reflecting acroporid framework

Base of spur and groove zone, *Dictyota* and octocorals more prevalent, relief up to 1 m, more patchy below 6 m
Higher relief and octocoral dominated, very complex habitat, reflecting origin of substratum
Near southern end of SPA, same habitat type
More similar to first block, but greater degree of succession, more gorgonians
Central area of reef, relief up to 3.5 m, seaward end, isolated chunks of spur and haystack *Montastraea*
Benthic diversity high, larger coralline spurs, top of spurs with abundant *M. complanata*
North of second site, transect on top of spur
Seaward end of spur 3.5-4 m wide, spurs up to 3.5 m high, dominated by algae, gorgonians and corals
All sites: southern end of reef at MB NN2, turf, some *H. opuntia* and CCA dominant, grooves 5-7 m wide
Spurs up to 3-m high and maximum vertical relief to 3.5 m, storm-derived rubble seaward of spur and groove
Octrocorals abundant, some smaller coral heads
Palythoa , *G. ventalina* , *P. flexuosa* and *M. complanata* abundant on spur surfaces
All four sites: South of Elbow SPA, slightly deeper, turf algae and CCA dominant benthos
More *Dictyota* and *H. opuntia* than inside SPA, *P. americana* and *G. ventalina* abundant on spur surfaces
Spurs 3.5-4 m wide, up to 3.5 m high and as shallow as 6 m
Many fractures and crevices in spur structure, spurs smaller with more rubble at third and fourth sites
Southern end of SPA, large areas of storm-derived rubble, *Dictyota* more prevalent on sides of spurs
Transects on spur tops, spurs 4-4.5 m wide, grooves 3.5-4 m wide
Spur surfaces dominated by turf algae and CCA, but also sea plumes, *M. complanata* and *A. wiedenmayaari*
Small patches of *Halimeda* , parrotfish grazing significant, relief up to 3 m
First two sites offshore of main spur and groove, reef ridge due south of tower, turf and CCA dominant
Ridge oriented 210/30, consisting of elkhorn coral framework with abundant gorgonians
Back in spur and groove zone near MB E3, dead upright *A. palmata* , spurs 3.5-4 m high
Northeast of third site, more live *A. palmata* , spurs as shallow as 3.5 m
All four sites: some remnant spur and groove, *Dictyota* , turf and silt on hard-bottom, abundant gorgonians
Many small *P. americana* (5-20 cm), sponge cover low, small corals mostly *M. alcicornis*
Relief up to 1-m, but generally < 0.5 m, many ledges and crevices with spiny lobster
Many patches of *Erythropodium* and smaller patches of finger corals
All four sites: similar habitat type as first block, slightly deeper transect placement
Fewer juvenile *P. americana*
Third and fourth sites closer to SPA boundary and fewer gorgonians
See Dustan and Halas (1987) for description of gorgonian zone, very silty

Transects placed inshore to offshore, many small *D. stokesi*
Dictyota and turf algae dominant, transitional area between spur and groove and fore reef terrace
Some isolated and mostly dead *M. faveolata* , relief up to 1.5 m
Similar habitat type as first block
More algal turf and sediment and less coverage by *Dictyota*
Third and fourth sites bounded at northern end by sand
Weakly defined spur and groove, *Dictyota* , turf algae and gorgonians dominant
Substrate consists of *A. palmata* framework, but few live corals; mostly Millepora
Large patches of sand between blocks of reef
Gorgonians very abundant, most 20 cm tall (climax community)
Shoals up to continuous hard-bottom at 6-8 m, fine turf and *Dictyota* dominant, abundant sediment and turf
Very wave swepy, no large corals, gorgonians abundant, most sponges encrusting, relief up to 1-m
Less *Dictyota* , most fine turf with sand
More *Dictyota* than third site
Large coralline fingers 6-7 m wide and 1-m above sand, turf and *Dictyota* dominant, more relief above 9 m
More continuous hard-bottom, large 50-80 cm *Plexaurella* , *P. flexuosa* and *E. tourneforti*
Similar to first two sites; replacement reference block for shallow Elbow Reef SPA
Similar to first two sites; replacement reference block for shallow Elbow Reef SPA

						M. Chiappone			S. Holst			D. Swanson		
Date	Block/Ref #	General Location	Region	LAT (N)	LON (W)	Dive #	Depth (ft.)	BT (min.)	Dive #	Depth (ft.)	BT (min.)	Dive #	Depth (ft.)	BT (min.)
8/6/99	LVL1 1	Western Dry Rocks	Lower Keys	24° 26.707	81° 55.693	1	29	68	1	29	63	1	30	68
8/6/99	LVL1 2	Western Dry Rocks	Lower Keys	24° 26.672	81° 55.669									
8/6/99	LVL1 3	Western Dry Rocks	Lower Keys	24° 26.663	81° 55.588	2	32	58	2	27	22	2	31	58
8/6/99	LVL1 4	Western Dry Rocks	Lower Keys	24° 26.669	81° 55.669									
8/6/99	LVL1 5	Western Dry Rocks	Lower Keys	24° 26.674	81° 55.612	3	30	20	3	29	20	3	30	20
8/6/99	LVL1 6	Western Dry Rocks	Lower Keys	24° 26.672	81° 55.629									
8/6/99	LVL1 7	Western Dry Rocks	Lower Keys	24° 26.741	81° 55.514	4	32	70	4	29	58	4	29	70
8/6/99	LVL1 8	Western Dry Rocks	Lower Keys	24° 26.741	81° 55.465									
8/7/99	LVL1 7	Western Dry Rocks	Lower Keys	24° 26.741	81° 55.514	1	28	55	1	24	17	1	26	55
8/7/99	LVL1 8	Western Dry Rocks	Lower Keys	24° 26.741	81° 55.465									
8/7/99	NTZ 17	Eastern Sambo SPA	Lower Keys	24° 29.439	81° 39.865	2	20	58	2	29	52	2	30	58
8/7/99	NTZ 18	Eastern Sambo SPA	Lower Keys	24° 29.441	81° 39.853									
8/7/99	NTZ 19	Eastern Sambo SPA	Lower Keys	24° 29.451	81° 39.939	3	30	35	3	31	52	3	30	35
8/7/99	NTZ 20	Eastern Sambo SPA	Lower Keys	24° 29.417	81° 39.970									
8/7/99	NTZ 21	Eastern Sambo SPA	Lower Keys	24° 29.464	81° 39.753	4	31	59	4	31	47	4	31	59
8/7/99	NTZ 22	Eastern Sambo SPA	Lower Keys	24° 29.468	81° 39.765									
8/8/99	NTZ 23	Eastern Sambo SPA	Lower Keys	24° 29.516	81° 39.521	1	29	45	1	28	45	1	28	45
8/8/99	NTZ 24	Eastern Sambo SPA	Lower Keys	24° 29.519	81° 39.545									
8/8/99	LVL1 9	Middle Sambo Reef	Lower Keys	24° 29.270	81° 40.486	2	29	54	2	28	54	2	29	54
8/8/99	LVL1 10	Middle Sambo Reef	Lower Keys	24° 29.277	81° 40.480									
8/8/99	LVL1 11	Middle Sambo Reef	Lower Keys	24° 29.296	81° 40.423	3	30	47	3	28	47	3	30	47
8/8/99	LVL1 12	Middle Sambo Reef	Lower Keys	24° 29.271	81° 40.457									
8/8/99	LVL1 13	Middle Sambo Reef	Lower Keys	24° 29.344	81° 40.246	4	29	61	4	29	61	4	29	61
8/8/99	LVL1 14	Middle Sambo Reef	Lower Keys	24° 29.330	81° 40.270									
8/8/99	LVL1 15	Middle Sambo Reef	Lower Keys	24° 29.325	81° 40.280	5	31	40	5	31	40	5	31	40
8/8/99	LVL1 16	Middle Sambo Reef	Lower Keys	24° 29.338	81° 40.241									
8/9/99	NTZ 10	Western Sambo SPA	Lower Keys	24° 28.717	81° 43.400	1	32	56	1	31	56	1	32	56
8/9/99	NTZ 11	Western Sambo SPA	Lower Keys	24° 28.719	81° 43.455									
8/9/99	NTZ 12	Western Sambo SPA	Lower Keys	24° 28.722	81° 43.545	2	32	48	2	32	48	2	32	48
8/9/99	NTZ 13	Western Sambo SPA	Lower Keys	24° 28.712	81° 43.126									
8/9/99	NTZ 14	Western Sambo SPA	Lower Keys	24° 28.714	81° 43.126	3	35	70	3	34	70	3	36	70
8/9/99	NTZ 15	Western Sambo SPA	Lower Keys	24° 28.728	81° 43.208									
8/9/99	NTZ 16	Western Sambo SPA	Lower Keys	24° 28.728	81° 43.122	4	34	50	4	34	50	4	34	50
8/9/99	NTZ 9	Western Sambo SPA	Lower Keys	24° 28.725	81° 43.438									
8/10/99	NTZ 1	Sand Key SPA	Lower Keys	24° 27.085	81° 52.697	1	34	68	1	33	68	1	34	68
8/10/99	NTZ 2	Sand Key SPA	Lower Keys	24° 27.087	81° 52.711									
8/10/99	NTZ 3	Sand Key SPA	Lower Keys	24° 27.095	81° 52.706	2	33	47	2	33	47	2	34	47
8/10/99	NTZ 4	Sand Key SPA	Lower Keys	24° 27.088	81° 52.724									
8/10/99	NTZ 5	Sand Key SPA	Lower Keys	24° 27.085	81° 52.711	3	34	74	3	33	74	3	34	74
8/10/99	NTZ 6	Sand Key SPA	Lower Keys	24° 27.085	81° 52.711									
8/10/99	NTZ 7	Sand Key SPA	Lower Keys	24° 27.085	81° 52.711	4	35	60	4	33	60	4	34	60
8/10/99	NTZ 8	Sand Key SPA	Lower Keys	24° 27.085	81° 52.711									
8/11/99	LVL1 17	Maryland Shoal	Lower Keys	24° 30.832	81° 33.579	1	31	80	1	30	80	1	30	80
8/11/99	LVL1 18	Maryland Shoal	Lower Keys	24° 30.793	81° 33.543									
8/11/99	LVL1 19	Maryland Shoal	Lower Keys	24° 30.801	81° 33.547	2	32	38	2	31	38	2	32	38
8/11/99	LVL1 20	Maryland Shoal	Lower Keys	24° 30.832	81° 33.595									
8/12/99	LVL1 25	American Shoal	Lower Keys	24° 31.358	81° 30.793	1	35	85	1	33	85	1	35	85
8/12/99	LVL1 26	American Shoal	Lower Keys	24° 31.354	81° 30.811									
8/12/99	LVL1 27	American Shoal	Lower Keys	24° 31.366	81° 30.770	2	35	50	2	35	50	2	35	50
8/12/99	LVL1 28	American Shoal	Lower Keys	24° 31.364	81° 30.794									

8/12/99	LVL1 21	West of American Shoal	Lower Keys	24° 30.963	81° 32.543	3	34	85	3	34	85	3	34	85
8/12/99	LVL1 22	West of American Shoal	Lower Keys	24° 30.963	81° 32.543									
8/12/99	LVL1 23	West of American Shoal	Lower Keys	24° 30.963	81° 32.543	4	31	50	4	31	50	4	31	50
8/12/99	LVL1 24	West of American Shoal	Lower Keys	24° 30.963	81° 32.543									
8/12/99	LVL1 37	West of American Shoal	Lower Keys	24° 31.165	81° 32.564	5	21	35	5	21	35	5	21	35
8/12/99	LVL1 38	West of American Shoal	Lower Keys	24° 31.135	81° 32.443									
8/13/99	LVL1 39	West of American Shoal	Lower Keys	24° 31.174	81° 32.537	1	19	43	1	19	43	1	21	43
8/13/99	LVL1 40	West of American Shoal	Lower Keys	24° 31.182	81° 32.516									
8/13/99	LVL1 41	American Shoal	Lower Keys	24° 31.353	81° 31.078	2	25	60	2	24	60	2	23	60
8/13/99	LVL1 42	American Shoal	Lower Keys	24° 31.357	81° 31.089									
8/13/99	LVL1 43	American Shoal	Lower Keys	24° 31.382	81° 31.123	3	21	50	3	18	50	3	21	50
8/13/99	LVL1 44	American Shoal	Lower Keys	24° 31.372	81° 31.135									
8/14/99	NTZ 33	Looe Key Research Only	Lower Keys	24° 33.919	81° 23.547	1	25	71	1	26	71	1	26	71
8/14/99	NTZ 34	Looe Key Research Only	Lower Keys	24° 33.929	81° 23.517	2	29	56	2	25	56	2	25	56
8/15/99	LVL1 53	Delta Shoal	Middle Keys	24° 37.822	81° 05.769	1	27	90	1	28	90			
8/15/99	LVL1 54	Delta Shoal	Middle Keys	24° 37.850	81° 05.709									
8/15/99	LVL1 55	Delta Shoal	Middle Keys	24° 37.845	81° 05.691	2	30	51	2	30	51			
8/15/99	LVL1 56	Delta Shoal	Middle Keys	24° 37.820	81° 05.611									
8/25/99	NTZ 35	Looe Key Research Only	Lower Keys	24° 33.928	81° 23.534	1	25	56	1	25	56	1	26	56
8/25/99	NTZ 36	Looe Key Research Only	Lower Keys	24° 33.893	81° 23.549									
8/25/99	NTZ 37	Looe Key Research Only	Lower Keys	24° 34.078	81° 23.117	2	28	143	2	25	61	2	28	143
8/25/99	NTZ 38	Looe Key Research Only	Lower Keys	24° 34.078	81° 23.124									
8/26/99	NTZ 25	Looe Key SPA	Lower Keys	24° 32.762	81° 24.268	1	28	77	1	27	161	1	25	161
8/26/99	NTZ 26	Looe Key SPA	Lower Keys	24° 32.736	81° 24.243									
8/26/99	NTZ 27	Looe Key SPA	Lower Keys	24° 32.767	81° 24.217	2	25	42	2	24	42	2	27	42
8/26/99	NTZ 28	Looe Key SPA	Lower Keys	24° 32.777	81° 24.214									
8/26/99	NTZ 39	Looe Key Research Only	Lower Keys	24° 34.096	81° 23.126	3	25	55	3	25	55	3	25	55
8/26/99	NTZ 40	Looe Key Research Only	Lower Keys	24° 34.073	81° 23.124									
8/26/99	LVL1 45	Southwest of Looe Key RO	Lower Keys	24° 33.830	81° 24.027	4	23	117	4	19	117	4	21	117
8/26/99	LVL1 46	Southwest of Looe Key RO	Lower Keys	24° 33.786	81° 24.019									
8/26/99	LVL1 45	Southwest of Looe Key RO	Lower Keys	24° 33.830	81° 24.027	5	23	55	5	55	60	5	55	60
8/26/99	LVL1 46	Southwest of Looe Key RO	Lower Keys	24° 33.786	81° 24.019									
8/27/99	NTZ 29	Looe Key SPA	Lower Keys	24° 32.719	81° 24.365	1	28	56	1	29	136	1	28	136
8/27/99	NTZ 30	Looe Key SPA	Lower Keys	24° 32.722	81° 24.376									
8/27/99	NTZ 31	Looe Key SPA	Lower Keys	24° 32.709	81° 24.422	2	28	49	2	26	49	2	28	49
8/27/99	NTZ 32	Looe Key SPA	Lower Keys	24° 32.703	81° 24.447									
8/27/99	LVL1 47	Southwest of Looe Key RO	Lower Keys	24° 33.842	81° 23.988	3	24	68	3	23	68	3	25	68
8/27/99	LVL1 48	Southwest of Looe Key RO	Lower Keys	24° 33.843	81° 23.951									
8/27/99	LVL1 49	West of Looe Key RO	Lower Keys	24° 33.842	81° 23.814	4	29	90	4	29	113	4	29	113
8/27/99	LVL1 50	West of Looe Key RO	Lower Keys	24° 33.833	81° 23.810									
8/28/99	LVL1 29	Southwestern Looe Key	Lower Keys	24° 32.546	81° 24.922	1	32	54	1	30	74	1	31	74
8/28/99	LVL1 30	Southwestern Looe Key	Lower Keys	24° 32.552	81° 24.903									
8/28/99	LVL1 31	Southwestern Looe Key	Lower Keys	24° 32.552	81° 24.900	2	40	79	2	40	79	2	40	79
8/28/99	LVL1 32	Southwestern Looe Key	Lower Keys	24° 32.548	81° 24.922									
8/28/99	LVL1 51	West of Looe Key RO	Lower Keys	24° 33.837	81° 23.799	3	38	52	3	38	52	3	38	52
8/28/99	LVL1 52	West of Looe Key RO	Lower Keys	24° 33.831	81° 23.799									
8/28/99	LVL1 33	West of Big Pine Shoal	Lower Keys	24° 33.670	81° 20.529	4	30	55	4	30	55	4	29	55
8/28/99	LVL1 34	West of Big Pine Shoal	Lower Keys	24° 33.666	81° 20.517									
8/28/99	LVL1 35	West of Big Pine Shoal	Lower Keys	24° 33.656	81° 20.592	5	30	50	5	30	50	5	28	50
8/28/99	LVL1 36	West of Big Pine Shoal	Lower Keys	24° 33.672	81° 20.514									
8/29/99	LVL1 57	South of Big Pine Key	Middle Keys	24° 35.914	81° 12.911	1	36	55	1	31	55	1	35	55
8/29/99	LVL1 58	South of Big Pine Key	Middle Keys	24° 35.913	81° 12.852									

8/29/99	LVL1 59	South of Big Pine Key	Middle Keys	24° 35.930	81° 12.940	2	30	40	2	30	40	2	31	40
8/29/99	LVL1 60	South of Big Pine Key	Middle Keys	24° 35.920	81° 12.950									
8/29/99	LVL1 61	Southeast of Big Pine Key	Middle Keys	24° 36.103	81° 12.429	3	28	69	3	27	69	3	29	69
8/29/99	LVL1 62	Southeast of Big Pine Key	Middle Keys	24° 36.083	81° 12.412									
8/29/99	LVL1 63	Southeast of Big Pine Key	Middle Keys	24° 36.051	81° 12.516	4	33	42	4	33	42	4	34	42
8/29/99	LVL1 64	Southeast of Big Pine Key	Middle Keys	24° 36.041	81° 12.479									
8/30/99	LVL1 65	West of Sombrero Reef	Middle Keys	24° 36.348	81° 11.164	1	33	56	1	31	56	1	34	56
8/30/99	LVL1 66	West of Sombrero Reef	Middle Keys	24° 36.357	81° 11.129									
8/30/99	LVL1 67	West of Sombrero Reef	Middle Keys	24° 36.397	81° 11.069	2	32	43	2	31	43	2	33	43
8/30/99	LVL1 68	West of Sombrero Reef	Middle Keys	24° 36.398	81° 11.110									
8/30/99	LVL1 117	East of Sombrero Reef	Middle Keys	24° 37.929	81° 05.384	3	20	72	3	20	72	3	21	72
8/30/99	LVL1 118	East of Sombrero Reef	Middle Keys	24° 37.922	81° 05.374									
8/30/99	LVL1 119	East of Sombrero Reef	Middle Keys	24° 37.920	81° 05.422	4	18	43	4	17	43	4	18	43
8/30/99	LVL1 120	East of Sombrero Reef	Middle Keys	24° 37.925	81° 05.413									
8/30/99	NTZ 49	Sombrero Reef SPA	Middle Keys	24° 37.611	81° 06.475	5	22	88	5	21	88	5	22	88
8/30/99	NTZ 50	Sombrero Reef SPA	Middle Keys	24° 37.595	81° 06.495									
9/1/99	NTZ 51	Sombrero Reef SPA	Middle Keys	24° 37.566	81° 06.556	1	23	55	1	22	55	1	22	55
9/1/99	NTZ 52	Sombrero Reef SPA	Middle Keys	24° 37.567	81° 06.565									
9/1/99	NTZ 53	Sombrero Reef SPA	Middle Keys	24° 37.537	81° 06.617	2	25	96	2	23	72	2	24	96
9/1/99	NTZ 54	Sombrero Reef SPA	Middle Keys	24° 37.535	81° 06.638									
9/1/99	NTZ 55	Sombrero Reef SPA	Middle Keys	24° 37.509	81° 06.701	3	26	51	3	25	60	3	26	51
9/1/99	NTZ 56	Sombrero Reef SPA	Middle Keys	24° 37.517	81° 06.721									
9/2/99	NTZ 41	Sombrero Reef SPA	Middle Keys	24° 37.530	81° 06.577	1	28	54	1	29	54	1	28	54
9/2/99	NTZ 42	Sombrero Reef SPA	Middle Keys	24° 37.527	81° 06.592									
9/2/99	NTZ 43	Sombrero Reef SPA	Middle Keys	24° 37.523	81° 06.601	2	30	38	2	29	38	2	29	38
9/2/99	NTZ 44	Sombrero Reef SPA	Middle Keys	24° 37.525	81° 06.600									
9/2/99	NTZ 45	Sombrero Reef SPA	Middle Keys	24° 37.523	81° 06.644	3	29	62	3	26	62	3	27	62
9/2/99	NTZ 46	Sombrero Reef SPA	Middle Keys	24° 37.513	81° 06.644									
9/2/99	NTZ 47	Sombrero Reef SPA	Middle Keys	24° 37.491	81° 06.667	4	31	39	4	31	39	4	31	39
9/2/99	NTZ 48	Sombrero Reef SPA	Middle Keys	24° 37.493	81° 06.679									
9/2/99	LVL1 69	South of Coffin's Patch	Middle Keys	24° 40.434	80° 57.580	5	30	71	5	30	71	5	30	71
9/2/99	LVL1 70	South of Coffin's Patch	Middle Keys	24° 40.440	80° 57.601									
9/2/99	LVL1 71	South of Coffin's Patch	Middle Keys	24° 40.420	80° 57.609	6	33	51	6	34	51	6	34	51
9/2/99	LVL1 72	South of Coffin's Patch	Middle Keys	24° 40.363	80° 57.608									
9/3/99	LVL1 73	Tennessee Light	Middle Keys	24° 44.655	80° 46.886	1	30	63	1	30	63	1	28	63
9/3/99	LVL1 74	Tennessee Light	Middle Keys	24° 44.662	80° 46.895									
9/3/99	LVL1 75	Tennessee Light	Middle Keys	24° 44.664	80° 46.919	2	30	42	2	28	42	2	28	42
9/3/99	LVL1 76	Tennessee Light	Middle Keys	24° 44.674	80° 46.904									
9/3/99	LVL1 77	Tennessee Light	Middle Keys	24° 44.568	80° 46.885	3	31	70	3	31	70	3	31	70
9/3/99	LVL1 78	Tennessee Light	Middle Keys	24° 44.650	80° 46.871									
9/3/99	LVL1 79	Tennessee Light	Middle Keys	24° 44.680	80° 46.740	4	30	48	4	29	48	4	30	48
9/3/99	LVL1 80	Tennessee Light	Middle Keys	24° 44.684	80° 46.722									
9/3/99	LVL1 81	Northeast of Tennessee Light	Middle Keys	24° 46.154	80° 44.506	5	30	76	5	30	76	5	29	76
9/3/99	LVL1 82	Northeast of Tennessee Light	Middle Keys	24° 46.161	80° 44.492									
9/3/99	LVL1 83	Northeast of Tennessee Light	Middle Keys	24° 46.158	80° 44.490	6	29	42	6	28	42	6	29	42
9/3/99	LVL1 84	Northeast of Tennessee Light	Middle Keys	24° 46.178	80° 44.476									
9/4/99	NTZ 57	Tennessee Reef RO	Middle Keys	24° 45.964	80° 45.230	1	29	89	1	30	89	1	29	89
9/4/99	NTZ 58	Tennessee Reef RO	Middle Keys	24° 45.940	80° 45.202									
9/4/99	NTZ 59	Tennessee Reef RO	Middle Keys	24° 45.902	80° 45.261	2	32	46	2	32	46	2	32	46
9/4/99	NTZ 60	Tennessee Reef RO	Middle Keys	24° 45.879	80° 45.266									
9/4/99	NTZ 61	Tennessee Reef RO	Middle Keys	24° 45.878	80° 45.282	3	32	80	3	31	86	3	31	86
9/4/99	NTZ 62	Tennessee Reef RO	Middle Keys	24° 45.874	80° 45.303									

9/4/99	NTZ 63	Tennessee Reef RO	Middle Keys	24° 45.832	80° 45.345	4	30	41	4	29	41	4	30	41
9/4/99	NTZ 64	Tennessee Reef RO	Middle Keys	24° 45.845	80° 45.347									
9/11/99	LVL1 85	Between Alligator & Tennessee	Middle Keys	24° 47.603	80° 41.794	1	33	78	1	33	78	1	32	78
9/11/99	LVL1 86	Between Alligator & Tennessee	Middle Keys	24° 47.612	80° 41.769									
9/11/99	LVL1 87	Between Alligator & Tennessee	Middle Keys	24° 47.573	80° 41.778	2	35	49	2	34	49	2	34	49
9/11/99	LVL1 88	Between Alligator & Tennessee	Middle Keys	24° 47.621	80° 41.746									
9/11/99	LVL1 89	West of Alligator Light	Middle Keys	24° 50.142	80° 38.295	3	32	69	3	31	69	3	31	69
9/11/99	LVL1 90	West of Alligator Light	Middle Keys	24° 50.147	80° 38.282									
9/11/99	LVL1 91	West of Alligator Light	Middle Keys	24° 50.147	80° 38.273	4	31	44	4	30	44	4	31	44
9/11/99	LVL1 92	West of Alligator Light	Middle Keys	24° 50.151	80° 38.259									
9/11/99	NTZ 65	Alligator SPA	Middle Keys	24° 50.840	80° 37.107	5	31	74	5	31	74	5	30	74
9/11/99	NTZ 66	Alligator SPA	Middle Keys	24° 50.860	80° 37.089									
9/11/99	NTZ 67	Alligator SPA	Middle Keys	24° 50.833	80° 37.129	6	32	44	6	32	44	6	31	44
9/11/99	NTZ 68	Alligator SPA	Middle Keys	24° 50.827	80° 37.138									
9/12/99	NTZ 69	Alligator SPA	Middle Keys	24° 50.909	80° 37.001	1	32	90	1	32	90	1	32	90
9/12/99	NTZ 70	Alligator SPA	Middle Keys	24° 50.923	80° 36.994									
9/12/99	NTZ 71	Alligator SPA	Middle Keys	24° 50.904	80° 37.016	2	33	49	2	32	49	2	33	49
9/12/99	NTZ 72	Alligator SPA	Middle Keys	24° 50.890	80° 37.031									
9/12/99	LVL1 97	Northeast of Alligator Light	Middle Keys	24° 52.075	80° 34.979	3	33	55	3	33	55	3	33	55
9/12/99	LVL1 98	Northeast of Alligator Light	Middle Keys	24° 52.077	80° 34.980									
9/12/99	LVL1 99	Northeast of Alligator Light	Middle Keys	24° 52.140	80° 34.884	4	36	36	4	36	36	4	35	36
9/12/99	LVL1 100	Northeast of Alligator Light	Middle Keys	24° 52.148	80° 34.877									
9/12/99	LVL1 101	Southwest of Davis Reef	Middle Keys	24° 54.455	80° 31.537	5	31	64	5	30	64	5	30	64
9/12/99	LVL1 102	Southwest of Davis Reef	Middle Keys	24° 54.459	80° 31.570									
9/12/99	LVL1 103	Southwest of Davis Reef	Middle Keys	24° 54.455	80° 31.564	6	29	50	6	29	50	6	30	50
9/12/99	LVL1 104	Southwest of Davis Reef	Middle Keys	24° 54.462	80° 31.546									
9/17/99	LVL1 93	Outside of Davis SPA	Middle Keys	24° 55.522	80° 30.057	1	30	53	1	30	53	1	30	53
9/17/99	LVL1 94	Outside of Davis SPA	Middle Keys	24° 55.535	80° 30.039									
9/17/99	LVL1 95	Outside of Davis SPA	Middle Keys	24° 55.592	80° 29.932	2	31	63	2	30	63	2	31	63
9/17/99	LVL1 96	Outside of Davis SPA	Middle Keys	24° 55.593	80° 29.914									
9/17/99	NTZ 129	Davis Reef SPA	Middle Keys	24° 55.342	80° 30.284	3	31	40	3	30	40	3	31	40
9/17/99	NTZ 130	Davis Reef SPA	Middle Keys	24° 55.357	80° 30.272									
9/17/99	NTZ 131	Davis Reef SPA	Middle Keys	24° 55.312	80° 30.346	4	28	44	4	26	44	4	27	44
9/17/99	NTZ 132	Davis Reef SPA	Middle Keys	24° 55.302	80° 30.371									
9/17/99	NTZ 133	Davis Reef SPA	Middle Keys	24° 55.298	80° 30.399	5	27	60	5	28	60	5	27	60
9/17/99	NTZ 134	Davis Reef SPA	Middle Keys	24° 55.298	80° 30.418									
9/17/99	NTZ 135	Davis Reef SPA	Middle Keys	24° 55.266	80° 30.408	6	29	43	6	27	43	6	27	43
9/17/99	NTZ 136	Davis Reef SPA	Middle Keys	24° 55.250	80° 30.412									
9/18/99	NTZ 73	Conch Reef SPA	Middle Keys	24° 57.023	80° 27.549	1	35	63	1	34	63	1	34	63
9/18/99	NTZ 74	Conch Reef SPA	Middle Keys	24° 57.016	80° 27.559									
9/18/99	NTZ 75	Conch Reef SPA	Middle Keys	24° 57.073	80° 27.501	2	33	42	2	32	42	2	32	42
9/18/99	NTZ 76	Conch Reef SPA	Middle Keys	24° 57.075	80° 27.522									
9/18/99	NTZ 77	Conch Reef SPA	Middle Keys	24° 57.075	80° 27.522	3	37	65	3	37	65	3	37	65
9/18/99	NTZ 78	Conch Reef SPA	Middle Keys	24° 57.075	80° 27.522									
9/18/99	NTZ 79	Conch Reef SPA	Middle Keys	24° 57.075	80° 27.522	4	36	40	4	34	40	4	35	40
9/18/99	NTZ 80	Conch Reef SPA	Middle Keys	24° 57.075	80° 27.522									
9/23/99	LVL1 125	Northeast of Conch Reef	Middle Keys	24° 56.930	80° 27.426	1	38	59	1	38	59	1	37	59
9/23/99	LVL1 126	Northeast of Conch Reef	Middle Keys	24° 56.932	80° 27.420									
9/23/99	LVL1 127	Northeast of Conch Reef	Middle Keys	24° 56.918	80° 27.405	2	39	43	2	39	43	2	39	43
9/23/99	LVL1 128	Northeast of Conch Reef	Middle Keys	24° 56.934	80° 27.396									
9/23/99	LVL1 129	Northeast of Conch Reef	Middle Keys	24° 56.865	80° 27.465	3	39	65	3	37	65	3	37	65
9/23/99	LVL1 130	Northeast of Conch Reef	Middle Keys	24° 56.872	80° 27.430									

9/23/99	LVL1 131	Northeast of Conch Reef	Middle Keys	24° 56.843	80° 27.483	4	38	43	4	36	43	4	37	43
9/23/99	LVL1 132	Northeast of Conch Reef	Middle Keys	24° 56.837	80° 27.386									
9/23/99	LVL1 113	Little Conch Reef	Middle Keys	24° 56.380	80° 28.600	5	34	72	5	35	72	5	34	72
9/23/99	LVL1 114	Little Conch Reef	Middle Keys	24° 56.389	80° 28.586									
9/24/99	LVL1 115	Little Conch Reef	Middle Keys	24° 56.447	80° 28.495	1	33	48	1	33	48	1	32	48
9/24/99	LVL1 116	Little Conch Reef	Middle Keys	24° 56.410	80° 28.606									
9/24/99	LVL1 105	Little Conch Reef	Middle Keys	24° 56.320	80° 28.648	2	33	73	2	32	73	2	32	73
9/24/99	LVL1 106	Little Conch Reef	Middle Keys	24° 56.369	80° 28.656									
9/24/99	LVL1 107	Little Conch Reef	Middle Keys	24° 56.328	80° 28.677	3	35	43	3	32	43	3	36	43
9/24/99	LVL1 108	Little Conch Reef	Middle Keys	24° 56.320	80° 28.659									
9/30/99	LVL1 109	Crocker Reef	Middle Keys	24° 54.275	80° 31.799	1	35	71				1	34	71
9/30/99	LVL1 110	Crocker Reef	Middle Keys	24° 54.280	80° 31.781									
9/30/99	LVL1 111	Crocker Reef	Middle Keys	24° 54.365	80° 31.689	2	31	41				2	30	41
9/30/99	LVL1 112	Crocker Reef	Middle Keys	24° 54.365	80° 31.678									
9/30/99	LVL1 121	Crocker Reef	Middle Keys	24° 54.503	80° 31.483	3	34	71				3	34	71
9/30/99	LVL1 122	Crocker Reef	Middle Keys	24° 54.509	80° 31.470									
9/30/99	LVL1 123	Crocker Reef	Middle Keys	24° 54.450	80° 31.511	4	37	42				4	36	42
9/30/99	LVL1 124	Crocker Reef	Middle Keys	24° 54.464	80° 31.489									
9/30/99	NTZ 81	Conch Reef Research Only	Middle Keys	24° 56.994	80° 27.310	5	42	84				5	42	84
9/30/99	NTZ 82	Conch Reef Research Only	Middle Keys	24° 57.000	80° 27.301									
10/1/99	NTZ 83	Conch Reef Research Only	Middle Keys	24° 56.990	80° 27.306	1	37	47				1	37	47
10/1/99	NTZ 84	Conch Reef Research Only	Middle Keys	24° 56.979	80° 27.323									
10/1/99	NTZ 85	Conch Reef Research Only	Middle Keys	24° 57.021	80° 27.290	2	45	83				2	46	83
10/1/99	NTZ 86	Conch Reef Research Only	Middle Keys	24° 57.028	80° 27.291									
10/1/99	NTZ 87	Conch Reef Research Only	Middle Keys	24° 57.021	80° 27.283	3	48	45				3	45	45
10/1/99	NTZ 88	Conch Reef Research Only	Middle Keys	24° 57.025	80° 27.382									
10/1/99	LVL1 133	Southwest of Pickles Reef	Upper Keys	24° 58.038	80° 26.777	4	35	84				4	34	84
10/1/99	LVL1 134	Southwest of Pickles Reef	Upper Keys	24° 58.003	80° 26.762									
10/1/99	LVL1 135	Southwest of Pickles Reef	Upper Keys	24° 58.020	80° 26.750	5	34	50				5	34	50
10/1/99	LVL1 136	Southwest of Pickles Reef	Upper Keys	24° 58.015	80° 26.779									
10/7/99	LVL1 137	Little Pickles Reef	Upper Keys	24° 58.615	80° 25.417	1	35	74				1	35	74
10/7/99	LVL1 138	Little Pickles Reef	Upper Keys	24° 58.610	80° 25.488									
10/7/99	LVL1 139	Little Pickles Reef	Upper Keys	24° 58.599	80° 25.490	2	29	45				2	29	45
10/7/99	LVL1 140	Little Pickles Reef	Upper Keys	24° 58.624	80° 25.475									
10/7/99	LVL1 141	Pickles Reef	Upper Keys	24° 58.938	80° 25.044	3	37	57				3	37	57
10/7/99	LVL1 142	Pickles Reef	Upper Keys	24° 58.970	80° 25.004	4	35	48				4	35	48
10/7/99	LVL1 143	Pickles Reef	Upper Keys	24° 58.926	80° 25.086	5	35	40				5	35	40
10/7/99	LVL1 144	Pickles Reef	Upper Keys	24° 58.942	80° 25.082									
11/1/99	NTZ 97	Molassses Reef SPA	Upper Keys	25° 00.658	80° 22.304	1	32	78	1	32	78	1	32	78
11/1/99	NTZ 98	Molassses Reef SPA	Upper Keys	25° 00.651	80° 22.309									
11/1/99	NTZ 99	Molassses Reef SPA	Upper Keys	25° 00.617	80° 22.348	2	34	40	2	34	40	2	34	40
11/1/99	NTZ 100	Molassses Reef SPA	Upper Keys	25° 00.612	80° 22.355									
11/1/99	NTZ 109	Molassses Reef SPA	Upper Keys	25° 00.563	80° 22.404	3	38	72	3	38	72	3	38	72
11/1/99	NTZ 110	Molassses Reef SPA	Upper Keys	25° 00.567	80° 22.423									
11/1/99	NTZ 111	Molassses Reef SPA	Upper Keys	25° 00.512	80° 22.493	4	36	45	4	36	45	4	36	45
11/1/99	NTZ 112	Molassses Reef SPA	Upper Keys	25° 00.499	80° 22.509									
11/16/99	NTZ 101	French Reef SPA	Upper Keys	25° 01.995	80° 20.998	1	33	79	1	33	79	1	33	79
11/16/99	NTZ 102	French Reef SPA	Upper Keys	25° 02.004	80° 20.986									
11/16/99	NTZ 103	French Reef SPA	Upper Keys	25° 01.941	80° 21.005	2	37	40	2	37	40	2	37	40
11/16/99	NTZ 104	French Reef SPA	Upper Keys	25° 01.951	80° 20.992									
11/16/99	NTZ 105	French Reef SPA	Upper Keys	25° 02.191	80° 20.764	3	34	67	3	34	67	3	34	67
11/16/99	NTZ 106	French Reef SPA	Upper Keys	25° 02.184	80° 20.746									

11/16/99	NTZ 107	French Reef SPA	Upper Keys	25° 02.155	80° 20.786	4	40	53	4	40	53	4	40	53
11/16/99	NTZ 108	French Reef SPA	Upper Keys	25° 02.211	80° 20.779									
11/16/99	LVL1 169	Dixie Shoal	Upper Keys	25° 03.716	80° 19.502	5	37	84	5	37	84	5	37	84
11/16/99	LVL1 170	Dixie Shoal	Upper Keys	25° 03.713	80° 19.476									
12/6/99	NTZ 89	Grecian Rocks SPA	Upper Keys	25° 06.624	80° 18.216	1	25	87	1	25	87	1	25	87
12/6/99	NTZ 90	Grecian Rocks SPA	Upper Keys	25° 06.595	80° 18.225									
12/6/99	NTZ 91	Grecian Rocks SPA	Upper Keys	25° 06.723	80° 18.157	2	29	46	2	29	46	2	29	46
12/6/99	NTZ 92	Grecian Rocks SPA	Upper Keys	25° 06.696	80° 18.178									
12/6/99	NTZ 93	Grecian Rocks SPA	Upper Keys	25° 06.514	80° 18.315	3	21	77	3	21	77	3	21	77
12/6/99	NTZ 94	Grecian Rocks SPA	Upper Keys	25° 06.418	80° 18.339									
12/6/99	NTZ 95	Grecian Rocks SPA	Upper Keys	25° 06.466	80° 18.357	4	20	51	4	20	51	4	20	51
12/6/99	NTZ 96	Grecian Rocks SPA	Upper Keys	25° 06.512	80° 18.374									
12/7/99	LVL1 177	Litte Grecian Rocks	Upper Keys	25° 07.089	80° 18.003	1	25	84	1	25	84	1	25	84
12/7/99	LVL1 178	Litte Grecian Rocks	Upper Keys	25° 07.100	80° 18.007									
12/7/99	LVL1 179	Litte Grecian Rocks	Upper Keys	25° 07.129	80° 18.008	2	26	47	2	26	47	2	26	47
12/7/99	LVL1 180	Litte Grecian Rocks	Upper Keys	25° 07.137	80° 18.006									
12/7/99	LVL1 181	North-North Dry Rocks	Upper Keys	25° 08.168	80° 17.382	3	25	83	3	25	83	3	25	83
12/7/99	LVL1 182	North-North Dry Rocks	Upper Keys	25° 08.177	80° 17.375									
12/7/99	LVL1 183	North-North Dry Rocks	Upper Keys	25° 08.185	80° 17.356	4	29	47	4	29	47	4	29	47
12/7/99	LVL1 184	North-North Dry Rocks	Upper Keys	25° 08.192	80° 17.354									
12/8/99	LVL1 171	Dixie Shoal	Upper Keys	25° 03.724	80° 19.521	1	37	84	1	37	84	1	37	84
12/8/99	LVL1 172	Dixie Shoal	Upper Keys	25° 03.730	80° 19.517									
12/8/99	LVL1 173	Dixie Shoal	Upper Keys	25° 04.138	80° 19.205	2	29	67	2	29	67	2	29	67
12/8/99	LVL1 174	Dixie Shoal	Upper Keys	25° 04.144	80° 19.195									
12/8/99	LVL1 175	Dixie Shoal	Upper Keys	25° 04.175	80° 19.172	3	35	36	3	35	36	3	35	36
12/8/99	LVL1 176	Dixie Shoal	Upper Keys	25° 04.166	80° 19.180									
12/9/99	LVL1 161	North of Carysfort SPA	Upper Keys	25° 14.814	80° 11.762	1	29	68	1	29	68	1	29	68
12/9/99	LVL1 162	North of Carysfort SPA	Upper Keys	25° 14.823	80° 11.747									
12/9/99	LVL1 163	North of Carysfort SPA	Upper Keys	25° 14.870	80° 11.712	2	35	35	2	35	35	2	35	35
12/9/99	LVL1 164	North of Carysfort SPA	Upper Keys	25° 14.864	80° 11.703									
12/11/99	NTZ 121	Elbow Reef SPA	Upper Keys	25° 08.299	80° 15.688	1	26	75	1	26	75	1	26	75
12/11/99	NTZ 122	Elbow Reef SPA	Upper Keys	25° 08.297	80° 15.700									
12/11/99	NTZ 123	Elbow Reef SPA	Upper Keys	25° 08.280	80° 15.733	2	24	35	2	24	35	2	24	35
12/11/99	NTZ 124	Elbow Reef SPA	Upper Keys	25° 08.271	80° 15.736									
12/11/99	NTZ 125	Elbow Reef SPA	Upper Keys	25° 08.423	80° 15.529	3	33	85	3	33	85	3	33	85
12/11/99	NTZ 126	Elbow Reef SPA	Upper Keys	25° 08.447	80° 15.513									
12/11/99	NTZ 127	Elbow Reef SPA	Upper Keys	25° 08.384	80° 15.600	4	28	34	4	28	34	4	28	34
12/11/99	NTZ 128	Elbow Reef SPA	Upper Keys	25° 08.392	80° 15.594									
12/11/99	LVL1 153	South of Elbow Reef SPA	Upper Keys	25° 08.211	80° 15.784	5	28	66	5	28	66	5	28	66
12/11/99	LVL1 154	South of Elbow Reef SPA	Upper Keys	25° 08.198	80° 15.791									
12/12/99	LVL1 155	South of Elbow Reef SPA	Upper Keys	25° 08.238	80° 15.720	1	28	45	1	28	45	1	28	45
12/12/99	LVL1 156	South of Elbow Reef SPA	Upper Keys	25° 08.252	80° 15.705									
12/14/99	LVL1 145	South of Carysfort SPA	Upper Keys	25° 11.902	80° 13.449	1	34	63	1	34	63	1	34	63
12/14/99	LVL1 146	South of Carysfort SPA	Upper Keys	25° 11.891	80° 13.451									
12/14/99	LVL1 147	South of Carysfort SPA	Upper Keys	25° 11.890	80° 13.472	2	29	35	2	29	35	2	29	35
12/14/99	LVL1 148	South of Carysfort SPA	Upper Keys	25° 11.886	80° 13.469									
12/14/99	LVL1 149	South of Carysfort SPA	Upper Keys	25° 11.935	80° 13.399	3	38	66	3	38	66	3	38	66
12/14/99	LVL1 150	South of Carysfort SPA	Upper Keys	25° 11.945	80° 13.394									
12/14/99	LVL1 151	South of Carysfort SPA	Upper Keys	25° 11.978	80° 13.366	4	39	35	4	39	35	4	39	35
12/14/99	LVL1 152	South of Carysfort SPA	Upper Keys	25° 11.988	80° 13.356									
12/14/99	LVL1 157	North of Carysfort SPA	Upper Keys	25° 14.653	80° 11.841	5	24	72	5	24	72	5	24	72
12/14/99	LVL1 158	North of Carysfort SPA	Upper Keys	25° 14.667	80° 11.836									

12/14/99	LVL1 159	North of Carysfort SPA	Upper Keys	25° 14.711	80° 11.815	6	22	31	6	22	31	6	22	31
12/14/99	LVL1 160	North of Carysfort SPA	Upper Keys	25° 14.724	80° 11.811									
12/15/99	NTZ 113	Carysfort/S. Carysfort SPA	Upper Keys	25° 13.451	80° 12.483	1	35	54	1	35	54	1	35	54
12/15/99	NTZ 114	Carysfort/S. Carysfort SPA	Upper Keys	25° 13.447	80° 12.485									
12/15/99	NTZ 115	Carysfort/S. Carysfort SPA	Upper Keys	25° 13.428	80° 12.498	2	36	31	2	36	31	2	36	31
12/15/99	NTZ 116	Carysfort/S. Carysfort SPA	Upper Keys	25° 13.414	80° 12.506									
12/15/99	NTZ 117	Carysfort/S. Carysfort SPA	Upper Keys	25° 13.546	80° 12.432	3	33	54	3	33	54	3	33	54
12/15/99	NTZ 118	Carysfort/S. Carysfort SPA	Upper Keys	25° 13.548	80° 12.428									
12/15/99	NTZ 119	Carysfort/S. Carysfort SPA	Upper Keys	25° 13.601	80° 12.412	4	33	26	4	33	26	4	33	26
12/15/99	NTZ 120	Carysfort/S. Carysfort SPA	Upper Keys	25° 13.604	80° 12.402									
12/15/99	LVL1 165	North of Carysfort SPA	Upper Keys	25° 14.848	80° 11.703	5	35	63	5	35	63	5	35	63
12/15/99	LVL1 166	North of Carysfort SPA	Upper Keys	25° 14.862	80° 11.728									
12/15/99	LVL1 167	North of Carysfort SPA	Upper Keys	25° 14.899	80° 11.717	6	31	33	6	31	33	6	31	33
12/15/99	LVL1 168	North of Carysfort SPA	Upper Keys	25° 14.901	80° 11.703									
TOTAL	**240 drops**	**80 blocks**				**164**	**20-48**	**4458**	**149**	**20-40**	**3576**	**162**	**20-46**	**4458**

A. White			RSMAS/NMFS/FKNMS Fish Observers			
Dive #	Depth (ft.)	BT (min.)	Name	Dive #	Depth (ft.)	BT (min.)
1	23	59	J. Javech	1	23	59
2	27	22		2	27	22
3	29	58		3	29	58
1	25	56	J. Javech	1	28	56
2	30	41		2	29	41
3	30	31		3	29	31
4	29	28		4	29	28
1	29	31	J. Javech	1	29	31
2	29	34		2	27	34
3	28	30		3	28	30
4	30	31		4	26	31
5	32	26		5	29	26
1	32	42	J. Javech	1	32	42
2	33	34		2	33	34
3	35	43		3	31	43
4	33	33		4	34	33
1	31	34	J. Javech	1	32	34
2	33	38		2	29	38
3	33	29		3	31	29
4	34	36		4	31	36
1	31	41	J. Javech	1	30	41
2	32	36		2	33	36
1	31	36	C. Schmitz	1	32	36
2	34	32		2	32	32

3	33	42		3	34	42
4	31	43		4	26	43
5	23	22		5	21	22
1	19	38	C. Schmitz	1	18	38
2	24	50		2	22	50
3	19	39		3	15	39
1	28	33	C. Schmitz	1	25	33
1	27	38	C. Schmitz	1	26	38
2	29	42		2	29	42
1	25	35	C. Schmitz	1	25	35
2	23	31		2	26	31
1	27	75	C. Schmitz	1	25	75
2	29	50		2	22	50
3	25	26		3	25	26
4	23	30		4	19	30
5	19	20		5	24	20
1	28	53	C. Schmitz	1	25	53
2	28	51		2	25	51
3	23	25		3	22	25
4	27	32		4	28	32
1	30	40	C. Schmitz	1	28	40
2	42	48		2	38	48
3	39	43		3	35	43
4	30	31		4	28	31
5	29	31		5	27	31
1	33	32	C. Schmitz	1	29	32

2	30	37		2	27	37
3	28	40		3	26	40
4	34	31		4	30	31
1	32	32	C. Schmitz	1	31	32
2	32	33		2	27	33
3	19	44		3	15	44
4	19	39		4	15	39
5	23	57		5	19	57
			C. Schmitz	1	23	55
				2	22	72
				3	21	60
			C. Schmitz	1	28	54
				2	29	38

			H. Molina	1	33	78
				2	35	49
				3	31	69
				4	29	44
				5	26	74
				6	30	44
			H. Molina	1	32	90
				2	35	49
				3	34	55
				4	34	36
				5	34	64
				6	30	50
			E. Franklin	1	30	53
				2	30	63
				3	29	40
				4	28	44
				5	27	60
				6	25	43
			C. Schmitz	1	34	63
				2	32	42
				3	37	65
				4	34	40
1	38	59	H. Molina	1	38	59
2	38	43		2	36	43
3	38	62		3	41	62

4	39	43		4	39	43
5	34	72		5	38	72
1	33	48	H. Molina	1	34	48
2	33	73		2	28	73
3	35	43		3	39	43
1	36	71				
2	31	41				
3	36	71				
4	38	42				
5	42	84				
1	38	47				
2	47	83				
3	46	45				
4	36	84				
5	34	50				
1	35	74				
2	29	45				
3	37	57				
4	35	48				
5	35	40				

1	25	87				
2	29	46				
3	21	77				
4	20	51				
1	25	84				
2	26	47				
3	25	83				
4	29	47				
1	37	84				
2	29	67				
3	35	36				
1	29	68				
2	35	35				
1	26	75				
2	24	35				
3	33	85				
4	28	34				
5	28	66				
1	28	45				
1	34	63				
2	29	35				
3	38	66				
4	39	35				
5	24	72				

6	22	31				
1	35	54				
2	36	31				
3	33	54				
4	33	26				
5	35	63				
6	31	33				
112	**20-47**	**3040**		**93**	**25-41**	**1300**

		Point-intercept Coverage		Species Richness		Gorgonian Abundance		Juvenile Corals		Coral Size/Condition	
Block Number	General Location	No. transects	No. points	No. transects	Area (m^2)	No. transects	Area (m^2)	No. transects	Area (m^2)	No. transects	Colonies
LVL1 1-4	Western Dry Rocks	4	400	8	80	2	20	2	20	2	49
LVL1 5-8	Western Dry Rocks	4	400	8	80	2	20	2	20	2	45
NTZ 1-4	Sand Key SPA	4	400	8	80	2	20	2	20	2	51
NTZ 5-8	Sand Key SPA	4	400	8	80	2	20	2	20	2	63
NTZ 9-12	Western Sambo SPA	4	400	8	80	2	20	2	20	2	35
NTZ 13-16	Western Sambo SPA	4	400	8	80	2	20	2	20	2	54
LVL1 9-12	Middle Sambo Reef	4	400	8	80	2	20	2	20	2	27
LVL1 13-16	Middle Sambo Reef	4	400	8	80	2	20	2	20	2	39
NTZ 17-20	Eastern Sambo SPA	4	400	8	80	2	20	2	20	2	48
NTZ 21-24	Eastern Sambo SPA	4	400	8	80	2	20	2	20	2	59
LVL1 17-20	Maryland Shoal	4	400	8	80	2	20	2	20	2	68
LVL1 21-24	West of American Shoal	4	400	8	80	2	20	2	20	2	81
LVL1 37-40	West of American Shoal	4	400	8	80	2	20	2	20	2	40
LVL1 41-44	American Shoal	4	400	8	80	2	20	2	20	2	54
LVL1 25-28	American Shoal	4	400	8	80	2	20	2	20	2	40
LVL1 29-32	Southwestern Looe Key	4	400	8	80	2	20	2	20	2	91
NTZ 29-32	Looe Key SPA	4	400	8	80	2	20	2	20	2	67
NTZ 25-28	Looe Key SPA	4	400	8	80	2	20	2	20	2	106
LVL1 45-48	Southwest of Looe Key RO	4	400	8	80	2	20	2	20	2	94
LVL1 49-52	West of Looe Key RO	4	400	8	80	2	20	2	20	2	92
NTZ 33-36	Looe Key Research Only	4	400	8	80	2	20	2	20	2	140
NTZ 37-40	Looe Key Research Only	4	400	8	80	2	20	2	20	2	106
LVL1 33-36	West of Big Pine Shoal	4	400	8	80	2	20	2	20	2	54
LVL1 57-60	South of Big Pine Key	4	400	8	80	2	20	2	20	2	16
LVL1 61-64	Southeast of Big Pine Key	4	400	8	80	2	20	2	20	2	36
LVL1 65-68	West of Sombrero Reef	4	400	8	80	2	20	2	20	2	45
NTZ 53-56	Sombrero Reef SPA	4	400	8	80	2	20	2	20	2	62
NTZ 45-48	Sombrero Reef SPA	4	400	8	80	2	20	2	20	2	56
NTZ 41-44	Sombrero Reef SPA	4	400	8	80	2	20	2	20	2	38
NTZ 49-52	Sombrero Reef SPA	4	400	8	80	2	20	2	20	2	38
LVL1 53-56	Delta Shoal	4	400	8	80	2	20	2	20	2	36
LVL1 117-120	East of Sombrero Reef	4	400	8	80	2	20	2	20	2	58
LVL1 69-72	South of Coffin's Patch	4	400	8	80	2	20	2	20	2	74
LVL1 73-76	Tennessee Light	4	400	8	80	2	20	2	20	2	61
LVL1 77-80	Tennessee Light	4	400	8	80	2	20	2	20	2	95
NTZ 61-64	Tennessee Reef RO	4	400	8	80	2	20	2	20	2	113
NTZ 57-60	Tennessee Reef RO	4	400	8	80	2	20	2	20	2	115
LVL1 81-84	Northeast of Tennessee Light	4	400	8	80	2	20	2	20	2	101
LVL1 85-88	Between Alligator & Tennessee	4	400	8	80	2	20	2	20	2	111
LVL1 89-92	West of Alligator Light	4	400	8	80	2	20	2	20	2	69
NTZ 65-68	Alligator SPA	4	400	8	80	2	20	2	20	2	82
NTZ 69-72	Alligator SPA	4	400	8	80	2	20	2	20	2	98
LVL1 97-100	Northeast of Alligator Light	4	400	8	80	2	20	2	20	2	59
LVL1 109-112	Crocker Reef	4	400	8	80	2	20	2	20	2	38
LVL1 121-124	Crocker Reef	4	400	8	80	2	20	2	20	2	53
LVL1 101-104	Southwest of Davis Reef	4	400	8	80	2	20	2	20	2	59
NTZ 133-136	Davis Reef SPA	4	400	8	80	2	20	2	20	2	38
NTZ 129-132	Davis Reef SPA	4	400	8	80	2	20	2	20	2	50
LVL1 93-96	Outside of Davis SPA	4	400	8	80	2	20	2	20	2	65
LVL1 105-108	Little Conch Reef	4	400	8	80	2	20	2	20	2	93

LVL1 113-116	Little Conch Reef	4	400	8	80	2	20	2	20	2	75
NTZ 73-76	Conch Reef SPA	4	400	8	80	2	20	2	20	2	86
NTZ 77-80	Conch Reef SPA	4	400	8	80	2	20	2	20	2	63
NTZ 81-84	Conch Reef Research Only	4	400	8	80	2	20	2	20	2	94
NTZ 85-88	Conch Reef Research Only	4	400	8	80	2	20	2	20	2	84
LVL1 129-132	Northeast of Conch Reef	2	200	8	80	2	20	2	20	2	63
LVL1 125-128	Northeast of Conch Reef	4	400	8	80	2	20	2	20	2	71
LVL1 133-136	Southwest of Pickles Reef	4	400	8	80	2	20	2	20	2	90
LVL1 137-140	Little Pickles Reef	4	400	8	80	2	20	2	20	2	42
LVL1 141-144	Pickles Reef	4	400	8	80	2	20	2	20	2	120
NTZ 97-100	Molasses Reef SPA	4	400	8	80	2	20	2	20	2	87
NTZ 109-112	Molasses Reef SPA	4	400	8	80	2	20	2	20	2	55
NTZ 101-104	French Reef SPA	4	400	8	80	2	20	2	20	2	62
NTZ 105-108	French Reef SPA	4	400	8	80	2	20	2	20	2	73
LVL1 169-172	Dixie Shoal	4	400	8	80	2	20	2	20	2	100
LVL1 173-176	Dixie Shoal	4	400	8	80	2	20	2	20	2	90
NTZ 89-92	Grecian Rocks SPA	4	400	8	80	2	20	2	20	2	62
NTZ 93-96	Grecian Rocks SPA	4	400	8	80	2	20	2	20	2	70
LVL1 177-180	Little Grecian Rocks	4	400	8	80	2	20	2	20	2	68
LVL1 181-184	North-North Dry Rocks	4	400	8	80	2	20	2	20	2	84
LVL1 153-156	South of Elbow Reef SPA	4	400	8	80	2	20	2	20	2	74
NTZ 121-124	Elbow Reef SPA	4	400	8	80	2	20	2	20	2	79
NTZ 125-128	Elbow Reef SPA	4	400	8	80	2	20	2	20	2	95
LVL1 145-148	South of Carysfort SPA	4	400	8	80	2	20	2	20	2	59
LVL1 149-152	South of Carysfort SPA	4	400	8	80	2	20	2	20	2	75
NTZ 113-116	Carysfort/S. Carysfort SPA	4	400	8	80	2	20	2	20	2	60
NTZ 117-120	Carysfort/S. Carysfort SPA	4	400	8	80	2	20	2	20	2	75
LVL1 157-160	North of Carysfort SPA	4	400	8	80	2	20	2	20	2	85
LVL1 161-164	North of Carysfort SPA	4	400	8	80	2	20	2	20	2	70
LVL1 165-168	North of Carysfort SPA	4	400	8	80	2	20	2	20	2	71
TOTAL	**80 blocks**	**318**	**31800**	**640**	**6400**	**160**	**1600**	**160**	**1600**	**160**	**5544**

		Mean (SD) Percent Cover (N=4 transects @ 100 points/transect)										
		Algae		Sponges		Gorgonians		Stony Corals			Coral Diversity (log_e)	
Block Number	General Location	Mean	SD	Mean	SD	Mean	SD	Mean	SD	No. Species	Diversity (H'c)	Evenness (J'c)
LVL1 1-4	Western Dry Rocks	77.75	9.22	2.50	1.73	1.50	1.73	1.75	1.26	5	1.550	0.963
LVL1 5-8	Western Dry Rocks	83.25	8.46	1.50	1.29	3.25	2.22	1.75	1.26	6	1.748	0.975
NTZ 1-4	Sand Key SPA	83.00	7.26	1.75	1.71	1.50	1.91	3.75	2.75	7	1.365	0.701
NTZ 5-8	Sand Key SPA	76.50	6.61	4.50	3.32	5.00	1.41	5.25	4.19	8	1.568	0.754
NTZ 9-12	Western Sambo SPA	78.75	2.36	2.25	2.22	2.50	2.08	3.50	1.91	5	1.433	0.891
NTZ 13-16	Western Sambo SPA	80.75	4.57	1.00	0.00	1.25	1.26	8.50	3.70	9	1.853	0.843
LVL1 9-12	Middle Sambo Reef	85.75	2.63	1.50	1.29	2.75	1.71	2.00	2.83	4	1.321	0.635
LVL1 13-16	Middle Sambo Reef	86.25	4.79	1.00	0.82	0.75	0.96	4.25	4.03	8	2.007	0.965
NTZ 17-20	Eastern Sambo SPA	82.00	6.27	1.00	0.82	3.00	1.15	4.00	3.56	5	1.230	0.764
NTZ 21-24	Eastern Sambo SPA	82.75	2.22	2.50	1.29	2.25	0.96	3.00	0.82	8	2.023	0.973
LVL1 17-20	Maryland Shoal	78.25	6.75	2.00	0.82	4.25	1.71	1.25	0.96	5	1.609	1.000
LVL1 21-24	West of American Shoal	78.00	3.56	4.50	1.73	4.00	3.56	2.75	2.06	8	1.972	0.949
LVL1 37-40	West of American Shoal	78.50	8.96	3.00	2.58	1.50	1.00	3.25	2.36	8	2.031	0.977
LVL1 41-44	American Shoal	77.25	0.96	4.00	2.16	4.00	1.15	1.75	1.26	4	1.277	0.921
LVL1 25-28	American Shoal	64.75	16.15	4.00	1.83	1.75	0.96	2.00	1.41	4	1.277	0.921
LVL1 29-32	Southwestern Looe Key	70.00	2.71	5.75	2.00	3.00	0.82	5.25	3.40	10	2.135	0.927
NTZ 29-32	Looe Key SPA	70.00	10.86	0.75	1.50	0.75	0.96	17.25	8.62	8	1.312	0.631
NTZ 25-28	Looe Key SPA	57.00	4.55	1.50	1.29	1.25	0.50	24.50	6.61	13	1.675	0.653
LVL1 45-48	Southwest of Looe Key RO	44.25	8.66	16.00	1.83	3.50	0.58	5.25	2.87	8	1.935	0.931
LVL1 49-52	West of Looe Key RO	37.75	3.30	11.50	1.00	4.75	3.00	19.00	3.56	10	1.934	0.840
NTZ 33-36	Looe Key Research Only	43.50	9.33	12.50	3.42	4.00	1.83	15.25	6.18	13	2.070	0.807
NTZ 37-40	Looe Key Research Only	34.50	9.15	14.50	1.73	4.50	1.00	17.75	6.85	9	1.722	0.784
LVL1 33-36	West of Big Pine Shoal	65.50	6.56	2.75	0.96	2.00	1.83	1.00	0.00	2	0.562	0.811
LVL1 57-60	South of Big Pine Key	70.75	11.73	2.25	1.71	0.25	0.50	0.75	0.50	3	1.099	1.000
LVL1 61-64	Southeast of Big Pine Key	66.25	14.93	1.50	1.73	2.00	2.83	2.00	1.41	5	1.560	0.970
LVL1 65-68	West of Sombrero Reef	78.00	3.92	1.50	1.00	1.50	1.00	2.25	0.50	5	1.427	0.887
NTZ 53-56	Sombrero Reef SPA	67.50	8.66	3.25	2.63	1.25	0.96	10.50	11.39	10	1.729	0.751
NTZ 45-48	Sombrero Reef SPA	67.50	16.05	3.75	3.10	0.75	0.50	1.50	1.29	4	1.330	0.960
NTZ 41-44	Sombrero Reef SPA	61.50	7.51	1.75	1.26	0.75	0.50	1.00	0.82	3	1.040	0.946
NTZ 49-52	Sombrero Reef SPA	61.00	5.48	3.25	1.50	1.25	0.96	4.00	2.58	8	1.906	0.917
LVL1 53-56	Delta Shoal	74.50	1.91	3.25	2.87	2.50	1.00	2.25	2.06	4	1.369	0.988
LVL1 117-120	East of Sombrero Reef	82.00	4.00	4.50	1.91	1.25	0.50	3.00	2.94	7	1.768	0.909
LVL1 69-72	South of Coffin's Patch	73.25	13.57	5.00	2.16	1.75	1.50	1.50	0.58	2	0.693	1.000
LVL1 73-76	Tennessee Light	75.50	3.11	5.00	1.83	0.50	0.58	1.00	0.82	3	1.099	1.000
LVL1 77-80	Tennessee Light	75.75	3.40	6.50	3.11	0.50	0.58	0.75	0.96	2	0.636	0.918
NTZ 61-64	Tennessee Reef RO	65.25	5.85	3.25	1.71	2.00	0.82	3.75	0.96	9	2.119	0.964
NTZ 57-60	Tennessee Reef RO	69.50	5.97	3.75	1.89	1.00	1.15	2.75	1.50	6	1.720	0.960
LVL1 81-84	Northeast of Tennessee Light	69.75	6.40	4.00	2.45	1.50	1.29	2.00	1.83	5	1.560	0.970
LVL1 85-88	Between Alligator & Tennessee	55.25	8.10	9.25	4.03	0.00	0.00	2.00	1.63	3	0.900	0.819
LVL1 89-92	West of Alligator Light	84.50	4.73	3.50	1.73	1.75	1.71	1.00	0.82	2	0.562	0.811
NTZ 65-68	Alligator SPA	79.25	3.59	4.25	1.50	0.75	0.96	1.00	0.82	2	0.562	0.811
NTZ 69-72	Alligator SPA	75.50	5.07	4.50	2.38	0.75	0.50	1.25	0.96	3	0.950	0.864
LVL1 97-100	Northeast of Alligator Light	82.75	6.95	6.00	2.82	0.25	0.50	0.50	1.00	2	0.693	1.000
LVL1 109-112	Crocker Reef	70.75	14.13	3.50	1.29	0.50	1.00	2.00	1.83	6	1.733	0.967
LVL1 121-124	Crocker Reef	67.00	13.49	4.00	1.83	0.50	0.58	1.00	0.82	4	1.386	1.000
LVL1 101-104	Southwest of Davis Reef	71.50	7.14	1.75	1.71	0.50	0.58	0.75	0.50	2	0.636	0.918

NTZ 133-136	Davis Reef SPA	86.25	2.75	1.00	1.41	0.25	0.50	1.00	0.82	3	1.040	0.946
NTZ 129-132	Davis Reef SPA	76.75	7.14	1.75	1.26	0.50	0.58	0.50	0.58	1	0.000	0.000
LVL1 93-96	Outside of Davis SPA	86.00	6.32	1.75	1.26	0.00	0.00	1.50	1.29	4	1.243	0.897
LVL1 105-108	Little Conch Reef	82.25	2.63	1.25	0.50	1.75	1.71	2.00	1.63	4	1.321	0.953
LVL1 113-116	Little Conch Reef	83.50	5.20	1.75	1.50	0.50	1.00	1.25	1.50	5	1.561	0.970
NTZ 73-76	Conch Reef SPA	84.00	4.90	3.25	2.06	1.00	1.15	1.00	1.41	2	0.693	1.000
NTZ 77-80	Conch Reef SPA	85.25	3.77	3.25	1.50	0.50	0.58	1.00	1.41	3	1.040	0.946
NTZ 81-84	Conch Reef Research Only	85.50	3.70	6.50	1.91	2.00	1.63	1.00	1.41	3	0.950	0.864
NTZ 85-88	Conch Reef Research Only	78.50	4.65	7.75	2.99	2.25	0.96	1.50	2.38	4	1.243	0.897
LVL1 129-132	Northeast of Conch Reef	88.50	0.71	2.50	2.12	2.00	1.41	2.50	0.71	5	1.609	1.000
LVL1 125-128	Northeast of Conch Reef	86.25	3.40	4.00	1.41	1.00	1.41	2.25	1.26	6	1.677	0.936
LVL1 133-136	Southwest of Pickles Reef	74.75	1.26	3.75	2.36	0.50	0.58	1.00	1.15	3	1.040	0.946
LVL1 137-140	Little Pickles Reef	70.50	12.77	3.25	1.26	0.50	0.58	1.00	0.82	2	0.693	1.000
LVL1 141-144	Pickles Reef	77.00	3.56	4.25	1.71	2.00	1.41	1.50	1.00	4	1.243	0.897
NTZ 97-100	Molasses Reef SPA	86.50	5.07	1.00	0.82	1.75	0.50	1.50	1.00	5	1.561	0.970
NTZ 109-112	Molasses Reef SPA	86.00	5.35	2.50	1.91	1.25	0.50	5.50	6.35	8	1.450	0.697
NTZ 101-104	French Reef SPA	81.75	4.27	1.50	0.58	2.50	0.58	9.75	3.77	8	1.323	0.636
NTZ 105-108	French Reef SPA	87.00	2.71	2.25	0.96	3.50	1.29	3.50	1.91	7	1.767	0.908
LVL1 169-172	Dixie Shoal	81.75	1.89	1.75	1.26	1.25	0.96	2.50	0.58	8	2.025	0.974
LVL1 173-176	Dixie Shoal	85.75	5.06	2.00	1.83	0.25	0.50	0.50	0.58	2	0.693	1.000
NTZ 89-92	Grecian Rocks SPA	85.75	4.27	2.25	1.71	1.00	1.41	4.00	2.16	9	1.733	0.789
NTZ 93-96	Grecian Rocks SPA	78.25	5.32	3.25	1.50	1.25	1.26	4.00	1.63	10	2.220	0.964
LVL1 177-180	Little Grecian Rocks	75.50	3.42	3.75	1.71	1.50	1.29	4.75	3.57	10	2.083	0.904
LVL1 181-184	North-North Dry Rocks	75.50	3.32	4.75	2.87	2.75	2.50	5.00	2.94	10	2.042	0.887
LVL1 153-156	South of Elbow Reef SPA	88.75	2.06	1.25	0.50	1.00	0.82	2.50	2.38	4	1.089	0.786
NTZ 121-124	Elbow Reef SPA	88.25	3.50	2.50	1.73	2.00	0.82	3.00	2.31	4	1.237	0.892
NTZ 125-128	Elbow Reef SPA	95.75	2.22	0.75	0.50	0.75	0.50	2.00	1.15	5	1.494	0.929
LVL1 145-148	South of Carysfort SPA	81.50	4.20	3.25	1.26	1.25	1.50	1.00	1.41	4	1.386	1.000
LVL1 149-152	South of Carysfort SPA	84.75	2.06	2.00	1.41	2.75	2.22	3.25	0.96	5	1.479	0.919
NTZ 113-116	Carysfort/S. Carysfort SPA	84.25	2.87	0.25	0.50	1.50	1.29	2.75	2.06	6	1.540	0.859
NTZ 117-120	Carysfort/S. Carysfort SPA	82.25	4.11	0.50	0.58	0.00	0.00	0.75	0.96	3	1.099	1.000
LVL1 157-160	North of Carysfort SPA	87.75	1.71	0.25	0.50	0.25	0.50	1.50	0.58	3	1.011	0.920
LVL1 161-164	North of Carysfort SPA	82.75	5.91	1.75	0.96	1.00	0.82	0.75	0.96	2	0.636	0.918
LVL1 165-168	North of Carysfort SPA	81.50	4.80	1.50	1.29	1.75	0.50	2.00	1.15	4	1.213	0.875

Stony Corals		**Gorgonians**		**Sponges**
Phylum Cnidaria		**Phylum Cnidaria**		**Phylum Porifera**
Class Anthozoa		**Class Anthozoa**		**Class Demospongeae**
Orders Scleractinia & Milleporina		**Subclass Octocorallia**		
Acropora cervicornis		*Briareum asbestinum*		*Agelas clathrodes*
Acropora palmata		*Erythropodium caribaeorum*		*Agelas conifera*
Agaricia agaricites		*Eunicea calyculata*		*Agelas dispar*
Agaricia fragilis		*Eunicea fusca*		*Agelas schmidti*
Agaricia humilis		*Eunicea knightii*		*Agelas wiedenmayaari*
Cladocora arbuscula		*Eunicea laciniata*		*Amphimedon compressa*
Colpophyllia natans		*Eunicea mammosa*		*Amphimedon viridis*
Dendrogyra cylindrus		*Eunicea palmeri*		*Anthosigmella varians*
Dichocoenia stokesi		*Eunicea succinea*		*Aplysina archeri*
Diploria clivosa		*Eunicea tourneforti*		*Aplysina cauliformis*
Diploria labyrinthiformis		*Gorgonia ventalina*		*Aplysina fistularis*
Diploria strigosa		*Iciligorgia schrammi*		*Aplysina fulva*
Eusmilia fastigiata		*Muricea atlantica*		*Aplysina lacunosa*
Favia fragum		*Muricea muricata*		*Callyspongia plicifera*
Isophyllastrea rigida		*Muriceopsis flavida*		*Callyspongia vaginalis*
Isophyllia sinuosa		*Plexaura flexuosa*		*Chondrilla nucula*
Leptoseris cucullata		*Plexaura homomalla*		*Chondrosia* sp.
Madracis decactis		*Plexaurella dichotoma*		*Cinachyra* sp.
Madracis formosa		*Plexaurella grisea*		*Clathria* sp.
Madracis mirabilis		*Plexaurella nutans*		*Cliona deletrix*
Manicina areolata		*Pseudoplexaura crucis*		*Cliona langae*
Meandrina meandrites		*Pseudoplexaura flagellosa*		*Cliona* sp. (brown encrusting)
Millepora alcicornis		*Pseudoplexaura porosa*		*Cribochalina vasculum*
Millepora complanata		*Pseudoplexaura wagenaari*		*Desmapsamma anchorata*
Montastraea annularis (I)		*Pseudopterogorgia acerosa*		*Diplastrella megastellata*
Montastraea faveolata (II)		*Pseudopterogorgia americana*		*Dysidea etheria*
Montastraea franksi (III)		*Pseudopterogorgia bipinnata*		*Ectyoplasia ferox*
Montastraea annularis spp.		*Pseudopterogorgia rigida*		*Erylus formosus*
Montastraea cavernosa		*Pterogorgia anceps*		*Geodia neptuna*
Mussa angulosa		*Pterogorgia citrina*		*Haliclona hogarthi*
Mycetophyllia aliciae		*Pterogorgia guadalupensis*		*Halisarca* sp.
Mycetophyllia danaana				*Holapsamma helwigi*
Mycetophyllia ferox				*Iotrochota birotulata*
Mycetophyllia lamarckiana				*Ircinia campana*
Oculina diffusa				*Ircinia felix*
Porites astreoides				*Ircinia strobilina*
Porites branneri				*Monanchora barbadensis*
Porites porites divaricata				*Monanchora unguifera*
Porites porites furcata				*Mycale laevis*
Porites porites porites				*Neofibularia notilangere*
Scolymia spp.				*Niphates digitalis*
Siderastrea radians				*Niphates erecta*
Siderastrea siderea				*Oligoceras hemorrhages*
Solenastrea bournoni				*Pandaros acanthifolium*
Stephanocoenia michelinii				*Plakortis angulospiculatis*
				Phorbas sp.
				Pseudoceratina crassa
				Pseuoaxinella lunaecharta
				Ptilocaulis sp.
				Rhaphidophlus venenosus
				Siphonodictyon coralliphagum
				Siphonodictyon siphonum
				Spheciospongia vesparium
				Spirastrella coccinea
				Strongylacidon sp.
				Ulosa ruetzleri
				Verongula gigantea

				Verongula rigida
				Xestospongia muta
				Unknown Red Squishy Sponge
				Unknown Blue Tube Sponge
				Unknown encrusting sponge
45 Taxa		**31 Taxa**		**62 Taxa**

		Stony Corals (N=8 transects/block)				Gorgonians (N=8 transects/block)				Sponges (N=8 transects/block)		
Block Number	General Location	Mean/Transect	SD	Total Species		Mean/Transect	SD	Total Species		Mean/Transect	SD	Total Species
LVL1 1-4	Western Dry Rocks	8.5	3.0	21		14.6	2.1	21		11.3	2.4	21
LVL1 5-8	Western Dry Rocks	11.4	2.6	24		12.0	2.7	19		8.8	1.9	21
NTZ 1-4	Sand Key SPA	14.8	2.6	27		11.3	1.7	17		9.9	2.7	21
NTZ 5-8	Sand Key SPA	15.0	2.3	32		15.3	2.2	23		12.9	2.7	31
NTZ 9-12	Western Sambo SPA	11.3	2.1	23		15.4	2.0	23		11.3	4.0	26
NTZ 13-16	Western Sambo SPA	13.9	2.4	28		9.9	1.6	19		10.9	1.7	19
LVL1 9-12	Middle Sambo Reef	12.6	2.0	23		10.4	2.2	19		10.9	2.5	21
LVL1 13-16	Middle Sambo Reef	11.0	1.5	23		11.6	1.4	21		11.0	1.1	24
NTZ 17-20	Eastern Sambo SPA	10.3	1.5	21		13.8	1.5	19		11.8	2.6	24
NTZ 21-24	Eastern Sambo SPA	11.8	1.4	23		13.8	1.9	21		11.1	2.3	27
LVL1 17-20	Maryland Shoal	10.6	2.1	19		17.4	2.1	25		12.1	2.7	25
LVL1 21-24	West of American Shoal	12.9	2.2	24		16.8	1.8	21		15.4	2.6	30
LVL1 37-40	West of American Shoal	9.0	2.6	18		14.9	1.8	21		12.5	2.3	25
LVL1 41-44	American Shoal	10.4	1.8	19		16.5	0.9	22		15.9	1.5	30
LVL1 25-28	American Shoal	9.5	1.9	17		18.1	1.1	23		15.5	2.0	30
LVL1 29-32	Southwestern Looe Key	17.3	2.5	29		14.8	1.9	21		19.3	2.4	31
NTZ 29-32	Looe Key SPA	13.8	2.3	24		10.8	1.7	19		11.1	2.6	23
NTZ 25-28	Looe Key SPA	13.5	1.6	24		8.9	1.8	15		12.0	2.0	24
LVL1 45-48	Southwest of Looe Key RO	13.4	3.1	23		18.1	1.2	24		21.3	1.4	29
LVL1 49-52	West of Looe Key RO	15.5	2.1	25		16.3	2.2	24		18.6	2.4	31
NTZ 33-36	Looe Key Research Only	14.0	1.8	28		18.1	1.6	24		19.9	3.0	34
NTZ 37-40	Looe Key Research Only	13.6	1.9	24		16.9	2.2	22		17.0	2.2	27
LVL1 33-36	West of Big Pine Shoal	9.5	1.6	21		15.9	2.7	25		14.5	2.5	30
LVL1 57-60	South of Big Pine Key	8.5	1.2	17		11.5	4.3	20		12.1	2.8	21
LVL1 61-64	Southeast of Big Pine Key	10.6	1.7	20		15.8	1.9	23		15.6	3.1	28
LVL1 65-68	West of Sombrero Reef	10.5	2.2	19		15.1	1.6	24		13.4	1.9	29
NTZ 53-56	Sombrero Reef SPA	11.9	1.2	23		7.6	1.5	14		11.5	3.3	22
NTZ 45-48	Sombrero Reef SPA	8.8	2.1	20		16.1	2.5	23		15.4	3.7	34
NTZ 41-44	Sombrero Reef SPA	8.0	2.3	17		15.6	2.4	23		10.6	2.9	24
NTZ 49-52	Sombrero Reef SPA	9.9	1.2	18		8.0	2.1	17		12.4	3.5	24
LVL1 53-56	Delta Shoal	9.9	1.6	19		12.9	2.0	21		12.6	1.4	24
LVL1 117-120	East of Sombrero Reef	12.5	1.1	20		16.9	2.6	24		13.3	1.7	26
LVL1 69-72	South of Coffin's Patch	8.4	3.1	18		13.4	1.5	21		18.1	2.3	32
LVL1 73-76	Tennessee Light	11.5	2.7	20		9.4	2.5	17		21.8	1.9	36
LVL1 77-80	Tennessee Light	9.6	2.4	18		12.8	1.6	21		22.4	1.8	38
NTZ 61-64	Tennessee Reef RO	13.6	1.2	22		15.9	1.4	22		19.8	1.8	30
NTZ 57-60	Tennessee Reef RO	14.3	1.5	20		13.8	1.5	21		17.8	1.5	30
LVL1 81-84	Northeast of Tennessee Light	10.5	2.1	16		13.4	2.1	21		18.0	2.0	35
LVL1 85-88	Between Alligator & Tennessee	9.0	1.8	15		10.4	2.2	21		18.3	1.5	27
LVL1 89-92	West of Alligator Light	8.5	1.1	13		15.8	0.9	21		15.4	3.2	28
NTZ 65-68	Alligator SPA	10.1	1.6	17		17.6	1.3	24		19.4	2.9	30
NTZ 69-72	Alligator SPA	12.0	1.8	21		16.1	1.9	22		19.8	1.3	36
LVL1 97-100	Northeast of Alligator Light	6.5	2.6	11		11.4	3.5	20		9.8	3.3	22
LVL1 109-112	Crocker Reef	10.6	2.2	18		12.3	3.2	19		16.0	3.1	33
LVL1 121-124	Crocker Reef	10.3	1.9	17		9.8	2.5	20		15.4	1.8	31
LVL1 101-104	Southwest of Davis Reef	7.5	1.7	15		13.1	2.3	20		13.5	3.1	25
NTZ 133-136	Davis Reef SPA	11.0	3.0	20		8.0	1.9	16		13.5	3.6	27
NTZ 129-132	Davis Reef SPA	9.9	2.0	19		9.3	2.3	16		17.0	2.3	31
LVL1 93-96	Outside of Davis SPA	10.5	2.3	18		9.9	2.4	16		14.4	1.8	27
LVL1 105-108	Little Conch Reef	11.9	1.9	21		12.4	1.5	19		15.4	2.6	27

LVL1 113-116	Little Conch Reef	9.6	1.1	17		12.5	2.7	20		13.8	2.5	27
NTZ 73-76	Conch Reef SPA	8.8	1.3	17		14.4	1.9	23		15.1	3.4	30
NTZ 77-80	Conch Reef SPA	8.5	1.6	18		11.6	3.6	21		12.3	3.7	31
NTZ 81-84	Conch Reef Research Only	9.9	1.7	19		11.0	1.4	18		17.5	2.1	33
NTZ 85-88	Conch Reef Research Only	12.1	1.5	23		8.6	1.6	14		21.0	2.3	34
LVL1 129-132	Northeast of Conch Reef	9.9	1.1	23		8.9	1.2	17		16.9	2.5	31
LVL1 125-128	Northeast of Conch Reef	9.3	1.8	17		11.5	2.7	21		15.8	2.7	28
LVL1 133-136	Southwest of Pickles Reef	11.3	1.7	18		11.4	1.9	18		15.5	2.3	27
LVL1 137-140	Little Pickles Reef	9.5	1.2	12		7.8	1.8	17		15.4	1.8	31
LVL1 141-144	Pickles Reef	10.5	1.4	18		13.1	2.2	21		14.8	2.8	26
NTZ 97-100	Molasses Reef SPA	12.0	1.7	23		9.9	1.1	17		11.8	1.9	23
NTZ 109-112	Molasses Reef SPA	10.6	1.3	23		8.6	1.6	15		11.0	1.4	24
NTZ 101-104	French Reef SPA	12.3	2.3	23		8.3	1.6	13		12.6	3.9	28
NTZ 105-108	French Reef SPA	11.9	2.5	25		7.8	1.9	12		9.3	1.8	19
LVL1 169-172	Dixie Shoal	12.0	2.2	22		13.1	1.5	20		15.4	2.1	29
LVL1 173-176	Dixie Shoal	9.5	1.8	16		12.5	1.6	21		14.5	3.3	29
NTZ 89-92	Grecian Rocks SPA	10.5	2.3	21		11.3	2.1	20		15.4	2.8	30
NTZ 93-96	Grecian Rocks SPA	10.3	1.3	18		12.6	2.2	21		18.3	3.8	32
LVL1 177-180	Little Grecian Rocks	11.5	1.9	21		13.8	2.8	23		19.5	2.4	33
LVL1 181-184	North-North Dry Rocks	11.3	2.4	24		13.3	1.8	22		20.5	3.5	32
LVL1 153-156	South of Elbow Reef SPA	8.8	2.5	20		8.1	1.4	16		9.9	2.0	21
NTZ 121-124	Elbow Reef SPA	7.6	0.9	14		7.4	2.2	17		8.0	1.3	17
NTZ 125-128	Elbow Reef SPA	8.0	2.1	15		7.9	3.8	16		7.8	2.1	19
LVL1 145-148	South of Carysfort SPA	10.1	1.4	20		15.1	1.9	22		12.8	1.7	24
LVL1 149-152	South of Carysfort SPA	10.0	1.8	20		12.6	3.6	21		13.4	2.7	28
NTZ 113-116	Carysfort/S. Carysfort SPA	9.5	1.5	19		12.0	1.5	20		6.3	0.9	12
NTZ 117-120	Carysfort/S. Carysfort SPA	8.6	1.6	16		14.1	2.9	23		9.0	2.3	15
LVL1 157-160	North of Carysfort SPA	10.1	1.4	19		14.3	1.5	23		9.1	2.0	19
LVL1 161-164	North of Carysfort SPA	9.8	1.7	22		15.3	1.5	25		12.5	3.3	27
LVL1 165-168	North of Carysfort SPA	11.3	2.1	19		16.5	2.1	23		14.0	2.2	27

Block Number	General Location	Total Species	Total Colonies	Mean Colonies/Transect	SD	Diversity (H'n)
LVL1 1-4	Western Dry Rocks	18	200	100.0	38.2	2.217
LVL1 5-8	Western Dry Rocks	18	234	117.0	26.9	2.083
NTZ 1-4	Sand Key SPA	14	165	82.5	24.8	1.722
NTZ 5-8	Sand Key SPA	21	288	144.0	11.3	2.316
NTZ 9-12	Western Sambo SPA	17	139	69.5	2.1	2.292
NTZ 13-16	Western Sambo SPA	10	107	53.5	2.1	1.662
LVL1 9-12	Middle Sambo Reef	16	158	79.0	5.7	1.982
LVL1 13-16	Middle Sambo Reef	17	138	69.0	8.5	2.153
NTZ 17-20	Eastern Sambo SPA	17	187	93.5	9.2	2.009
NTZ 21-24	Eastern Sambo SPA	16	162	81.0	8.5	1.953
LVL1 17-20	Maryland Shoal	23	235	117.5	31.8	2.684
LVL1 21-24	West of American Shoal	20	276	138.0	5.7	2.455
LVL1 37-40	West of American Shoal	18	152	76.0	25.5	2.408
LVL1 41-44	American Shoal	19	297	148.5	19.1	2.468
LVL1 25-28	American Shoal	21	293	146.5	17.7	2.639
LVL1 29-32	Southwestern Looe Key	20	296	148.0	17.0	2.081
NTZ 29-32	Looe Key SPA	10	70	35.0	24.0	1.646
NTZ 25-28	Looe Key SPA	14	116	58.0	12.7	2.190
LVL1 45-48	Southwest of Looe Key RO	22	412	206.0	15.6	2.446
LVL1 49-52	West of Looe Key RO	22	294	147.0	28.3	2.582
NTZ 33-36	Looe Key Research Only	19	282	141.0	7.1	2.582
NTZ 37-40	Looe Key Research Only	20	305	152.5	0.7	2.567
LVL1 33-36	West of Big Pine Shoal	22	152	76.0	32.5	2.481
LVL1 57-60	South of Big Pine Key	13	74	37.0	18.4	1.859
LVL1 61-64	Southeast of Big Pine Key	20	196	98.0	29.7	2.419
LVL1 65-68	West of Sombrero Reef	20	237	118.5	0.7	2.447
NTZ 53-56	Sombrero Reef SPA	9	64	32.0	11.3	1.649
NTZ 45-48	Sombrero Reef SPA	20	138	116.5	30.4	2.489
NTZ 41-44	Sombrero Reef SPA	20	185	92.5	6.4	2.536
NTZ 49-52	Sombrero Reef SPA	6	68	34.0	8.5	1.243
LVL1 53-56	Delta Shoal	14	112	56.0	7.1	2.271
LVL1 117-120	East of Sombrero Reef	22	301	150.5	41.7	2.250
LVL1 69-72	South of Coffin's Patch	18	222	111.0	9.9	2.206
LVL1 73-76	Tennessee Light	14	127	63.5	2.1	1.520
LVL1 77-80	Tennessee Light	17	163	81.5	3.5	2.001
NTZ 61-64	Tennessee Reef RO	18	271	135.5	17.7	2.323
NTZ 57-60	Tennessee Reef RO	17	203	101.5	10.6	2.217
LVL1 81-84	Northeast of Tennessee Light	18	168	84.0	8.5	2.219
LVL1 85-88	Between Alligator & Tennessee	18	179	89.5	30.4	1.672
LVL1 89-92	West of Alligator Light	18	220	110.0	1.4	2.517
NTZ 65-68	Alligator SPA	21	229	114.5	9.2	2.451
NTZ 69-72	Alligator SPA	20	220	110.0	26.9	2.050
LVL1 97-100	Northeast of Alligator Light	16	185	92.5	31.8	1.669
LVL1 109-112	Crocker Reef	11	164	82.0	5.7	1.166
LVL1 121-124	Crocker Reef	14	223	111.5	21.9	1.048
LVL1 101-104	Southwest of Davis Reef	18	111	55.5	13.4	2.306
NTZ 133-136	Davis Reef SPA	11	58	29.0	2.8	1.257
NTZ 129-132	Davis Reef SPA	13	118	59.0	8.5	1.647
LVL1 93-96	Outside of Davis SPA	14	166	83.0	8.5	1.496
LVL1 105-108	Little Conch Reef	17	354	177.0	8.5	1.334
LVL1 113-116	Little Conch Reef	17	237	118.5	5.0	1.857
NTZ 73-76	Conch Reef SPA	19	192	96.0	2.8	2.323
NTZ 77-80	Conch Reef SPA	19	143	71.5	12.0	2.077
NTZ 81-84	Conch Reef Research Only	15	259	129.5	5.0	1.623
NTZ 85-88	Conch Reef Research Only	11	199	99.5	26.2	1.394
LVL1 129-132	Northeast of Conch Reef	13	225	112.5	46.0	1.798
LVL1 125-128	Northeast of Conch Reef	18	281	140.5	0.7	1.804
LVL1 133-136	Southwest of Pickles Reef	15	195	97.5	5.2	1.756
LVL1 137-140	Little Pickles Reef	12	133	66.5	3.5	1.339
LVL1 141-144	Pickles Reef	20	213	106.5	47.4	1.883
NTZ 97-100	Molasses Reef SPA	12	337	168.5	13.4	1.586
NTZ 109-112	Molasses Reef SPA	11	349	174.5	44.5	1.642
NTZ 101-104	French Reef SPA	9	290	145.0	15.6	1.448
NTZ 105-108	French Reef SPA	11	333	166.5	61.5	1.338
LVL1 169-172	Dixie Shoal	16	262	131.0	28.3	1.757
LVL1 173-176	Dixie Shoal	17	307	153.5	38.9	1.470
NTZ 89-92	Grecian Rocks SPA	17	197	98.5	9.2	2.199
NTZ 93-96	Grecian Rocks SPA	21	347	173.5	133.6	1.901
LVL1 177-180	Little Grecian Rocks	19	452	226.0	22.6	2.051
LVL1 181-184	North-North Dry Rocks	19	395	197.5	6.4	1.892
LVL1 153-156	South of Elbow Reef SPA	12	188	94.0	32.5	1.693

NTZ 121-124	Elbow Reef SPA	11	271	135.5	75.7	1.542
NTZ 125-128	Elbow Reef SPA	13	268	134.0	15.6	1.879
LVL1 145-148	South of Carysfort SPA	18	395	197.5	71.4	1.964
LVL1 149-152	South of Carysfort SPA	20	282	141.0	12.7	2.196
NTZ 113-116	Carysfort/S. Carysfort SPA	15	320	160.0	8.5	1.793
NTZ 117-120	Carysfort/S. Carysfort SPA	19	254	127.0	22.6	1.840
LVL1 157-160	North of Carysfort SPA	18	262	131.0	31.1	1.801
LVL1 161-164	North of Carysfort SPA	18	232	116.0	7.1	1.905
LVL1 165-168	North of Carysfort SPA	21	289	144.5	33.2	2.149
TOTAL	**80 blocks**	**6-23 (range)**	**17821**	**29.0-206.0 (range)**		**1.243-2.684 (range)**

Evenness (J'n)
0.767
0.721
0.653
0.761
0.809
0.722
0.715
0.760
0.709
0.704
0.856
0.819
0.833
0.838
0.867
0.695
0.715
0.830
0.791
0.835
0.877
0.857
0.803
0.725
0.807
0.817
0.751
0.831
0.846
0.694
0.861
0.728
0.763
0.576
0.706
0.804
0.783
0.768
0.590
0.871
0.805
0.673
0.602
0.486
0.397
0.798
0.524
0.642
0.567
0.471
0.655
0.789
0.706
0.599
0.581
0.701
0.624
0.648
0.539
0.629
0.638
0.685
0.659
0.558
0.634
0.519
0.776
0.624
0.697
0.643
0.681

0.643
0.733
0.680
0.733
0.662
0.625
0.623
0.659
0.706
0.471-0.877 (range)

Block Number	General Location	Total Species	Total Juveniles	Mean/Transect	SD	Diversity (H'n)
LVL1 1-4	Western Dry Rocks	7	15	7.5	3.5	1.841
LVL1 5-8	Western Dry Rocks	8	21	10.5	2.1	1.951
NTZ 1-4	Sand Key SPA	9	30	15.0	11.3	1.942
NTZ 5-8	Sand Key SPA	12	34	17.0	8.5	1.923
NTZ 9-12	Western Sambo SPA	11	26	13.0	0.0	2.194
NTZ 13-16	Western Sambo SPA	10	22	11.0	4.2	2.096
LVL1 9-12	Middle Sambo Reef	11	43	21.5	9.2	2.016
LVL1 13-16	Middle Sambo Reef	7	17	8.5	0.7	1.723
NTZ 17-20	Eastern Sambo SPA	9	16	8.0	2.8	1.787
NTZ 21-24	Eastern Sambo SPA	5	14	7.0	0.0	1.296
LVL1 17-20	Maryland Shoal	9	21	10.5	5.0	2.095
LVL1 21-24	West of American Shoal	11	24	12.0	4.2	2.127
LVL1 37-40	West of American Shoal	8	14	7.0	1.4	1.778
LVL1 41-44	American Shoal	8	17	8.5	6.4	1.874
LVL1 25-28	American Shoal	9	22	11.0	1.4	2.032
LVL1 29-32	Southwestern Looe Key	15	43	21.0	2.1	2.201
NTZ 29-32	Looe Key SPA	2	5	2.5	0.7	0.673
NTZ 25-28	Looe Key SPA	5	8	4.0	1.4	1.560
LVL1 45-48	Southwest of Looe Key RO	9	46	23.0	9.9	1.170
LVL1 49-52	West of Looe Key RO	11	76	38.0	7.1	1.873
NTZ 33-36	Looe Key Research Only	6	26	13.0	0.0	1.518
NTZ 37-40	Looe Key Research Only	6	40	20.0	8.5	1.475
LVL1 33-36	West of Big Pine Shoal	6	16	8.0	7.1	1.581
LVL1 57-60	South of Big Pine Key	4	8	4.0	2.8	1.255
LVL1 61-64	Southeast of Big Pine Key	8	36	18.0	12.7	1.952
LVL1 65-68	West of Sombrero Reef	6	10	5.0	1.4	1.696
NTZ 53-56	Sombrero Reef SPA	7	51	25.5	9.2	1.387
NTZ 45-48	Sombrero Reef SPA	6	19	9.5	6.4	1.709
NTZ 41-44	Sombrero Reef SPA	6	14	7.0	2.8	1.352
NTZ 49-52	Sombrero Reef SPA	4	14	7.0	4.2	1.091
LVL1 53-56	Delta Shoal	8	27	13.5	6.0	1.877
LVL1 117-120	East of Sombrero Reef	8	33	16.5	2.1	1.822
LVL1 69-72	South of Coffin's Patch	5	9	4.5	5.0	1.465
LVL1 73-76	Tennessee Light	8	26	13.0	7.1	1.777
LVL1 77-80	Tennessee Light	9	25	12.5	7.8	2.061
NTZ 61-64	Tennessee Reef RO	11	64	32.0	1.4	2.025
NTZ 57-60	Tennessee Reef RO	11	59	29.5	21.9	1.808
LVL1 81-84	Northeast of Tennessee Light	8	25	12.5	5.0	1.911
LVL1 85-88	Between Alligator & Tennessee	7	18	9.0	8.5	1.798
LVL1 89-92	West of Alligator Light	7	30	15.0	0.0	1.693
NTZ 65-68	Alligator SPA	9	31	15.5	0.7	2.032
NTZ 69-72	Alligator SPA	12	36	18.0	2.8	2.275
LVL1 97-100	Northeast of Alligator Light	7	23	11.5	7.8	1.791
LVL1 109-112	Crocker Reef	7	13	6.5	2.1	1.712
LVL1 121-124	Crocker Reef	11	61	30.5	9.2	1.979
LVL1 101-104	Southwest of Davis Reef	4	17	8.5	7.8	1.071
NTZ 133-136	Davis Reef SPA	8	20	10.0	2.8	1.741
NTZ 129-132	Davis Reef SPA	6	12	6.0	0.0	1.705
LVL1 93-96	Outside of Davis SPA	11	38	19.0	9.9	2.065
LVL1 105-108	Little Conch Reef	7	33	16.5	6.5	1.575
LVL1 113-116	Little Conch Reef	6	37	18.5	2.1	1.508
NTZ 73-76	Conch Reef SPA	7	13	6.5	0.7	1.844
NTZ 77-80	Conch Reef SPA	8	17	8.5	0.7	1.956
NTZ 81-84	Conch Reef Research Only	7	15	7.5	0.7	1.622
NTZ 85-88	Conch Reef Research Only	8	25	12.5	2.1	1.676
LVL1 129-132	Northeast of Conch Reef	7	26	13.0	1.4	1.666
LVL1 125-128	Northeast of Conch Reef	7	22	11.0	7.1	1.693
LVL1 133-136	Southwest of Pickles Reef	9	34	17.0	2.8	1.902
LVL1 137-140	Little Pickles Reef	6	11	5.5	3.5	1.720
LVL1 141-144	Pickles Reef	10	27	13.5	9.2	2.152
NTZ 97-100	Molasses Reef SPA	11	49	24.5	4.9	2.029
NTZ 109-112	Molasses Reef SPA	9	25	12.5	6.4	1.881
NTZ 101-104	French Reef SPA	7	11	5.5	3.5	1.768
NTZ 105-108	French Reef SPA	6	32	16.0	5.7	1.481
LVL1 169-172	Dixie Shoal	11	46	23.0	7.1	2.051
LVL1 173-176	Dixie Shoal	9	41	20.5	13.4	1.799
NTZ 89-92	Grecian Rocks SPA	4	14	7.0	1.4	0.991
NTZ 93-96	Grecian Rocks SPA	7	18	9.0	1.4	1.610
LVL1 177-180	Little Grecian Rocks	9	30	15.0	0.0	1.849
LVL1 181-184	North-North Dry Rocks	7	19	9.5	0.5	1.663
LVL1 153-156	South of Elbow Reef SPA	6	27	13.5	2.1	1.500

NTZ 121-124	Elbow Reef SPA	4	14	7.0	4.2	1.171
NTZ 125-128	Elbow Reef SPA	7	51	25.5	3.5	1.162
LVL1 145-148	South of Carysfort SPA	6	15	7.5	7.8	1.380
LVL1 149-152	South of Carysfort SPA	8	21	10.5	5.0	1.765
NTZ 113-116	Carysfort/S. Carysfort SPA	7	22	11.0	2.8	1.460
NTZ 117-120	Carysfort/S. Carysfort SPA	9	20	10.0	4.2	1.917
LVL1 157-160	North of Carysfort SPA	8	27	13.5	5.0	1.780
LVL1 161-164	North of Carysfort SPA	5	17	8.5	5.0	1.430
LVL1 165-168	North of Carysfort SPA	6	10	5.0	0.0	1.696
TOTAL	**80 blocks**	**2-15 (range)**	**2084**	**2.5-38.0 (range)**		**0.673-2.275 (range)**

Evenness (J'n)
0.946
0.938
0.884
0.774
0.915
0.910
0.841
0.885
0.813
0.805
0.954
0.887
0.855
0.901
0.925
0.813
0.971
0.970
0.533
0.781
0.847
0.823
0.882
0.905
0.939
0.946
0.713
0.954
0.754
0.787
0.903
0.876
0.911
0.855
0.938
0.844
0.754
0.919
0.924
0.870
0.925
0.915
0.920
0.880
0.825
0.773
0.837
0.951
0.861
0.809
0.842
0.948
0.941
0.834
0.806
0.856
0.870
0.866
0.960
0.934
0.846
0.856
0.909
0.826
0.855
0.819
0.715
0.827
0.842
0.855
0.837

0.845
0.597
0.770
0.849
0.750
0.873
0.856
0.889
0.946
0.533-0.971 (range)

NURC/UNCW **Coral Abundance** **Level II Zone Monitoring**

Abundance (no. colonies/20 m^2)

Block Number	General Location	Total	Milleporina	Scleractinia
LVL1 1-4	Western Dry Rocks	49	27	22
LVL1 5-8	Western Dry Rocks	45	18	27
NTZ 1-4	Sand Key SPA	51	18	33
NTZ 5-8	Sand Key SPA	63	27	36
NTZ 9-12	Western Sambo SPA	35	13	22
NTZ 13-16	Western Sambo SPA	54	6	48
LVL1 9-12	Middle Sambo Reef	27	11	16
LVL1 13-16	Middle Sambo Reef	39	5	34
NTZ 17-20	Eastern Sambo SPA	48	12	36
NTZ 21-24	Eastern Sambo SPA	59	11	48
LVL1 17-20	Maryland Shoal	68	23	45
LVL1 21-24	West of American Shoal	81	32	49
LVL1 37-40	West of American Shoal	40	17	23
LVL1 41-44	American Shoal	53	21	32
LVL1 25-28	American Shoal	40	23	17
LVL1 29-32	Southwestern Looe Key	91	21	70
NTZ 29-32	Looe Key SPA	67	1	66
NTZ 25-28	Looe Key SPA	108	5	103
LVL1 45-48	Southwest of Looe Key RO	94	6	88
LVL1 49-52	West of Looe Key RO	91	2	89
NTZ 33-36	Looe Key Research Only	140	5	135
NTZ 37-40	Looe Key Research Only	106	3	103
LVL1 33-36	West of Big Pine Shoal	54	36	18
LVL1 57-60	South of Big Pine Key	16	6	10
LVL1 61-64	Southeast of Big Pine Key	36	13	23
LVL1 65-68	West of Sombrero Reef	45	28	17
NTZ 53-56	Sombrero Reef SPA	62	2	60
NTZ 45-48	Sombrero Reef SPA	56	26	30
NTZ 41-44	Sombrero Reef SPA	38	25	13
NTZ 49-52	Sombrero Reef SPA	38	1	37
LVL1 53-56	Delta Shoal	36	15	21
LVL1 117-120	East of Sombrero Reef	58	15	43
LVL1 69-72	South of Coffin's Patch	73	50	23
LVL1 73-76	Tennessee Light	61	37	24
LVL1 77-80	Tennessee Light	95	61	34
NTZ 61-64	Tennessee Reef RO	113	42	71
NTZ 57-60	Tennessee Reef RO	115	30	85
LVL1 81-84	Northeast of Tennessee Light	102	68	34
LVL1 85-88	Between Alligator & Tennessee	111	88	23
LVL1 89-92	West of Alligator Light	69	59	10
NTZ 65-68	Alligator SPA	82	65	17
NTZ 69-72	Alligator SPA	98	48	50

LVL1 97-100	Northeast of Alligator Light	59	45	14
LVL1 109-112	Crocker Reef	38	25	13
LVL1 121-124	Crocker Reef	53	36	17
LVL1 101-104	Southwest of Davis Reef	59	53	6
NTZ 133-136	Davis Reef SPA	38	9	29
NTZ 129-132	Davis Reef SPA	50	32	18
LVL1 93-96	Outside of Davis SPA	65	23	42
LVL1 105-108	Little Conch Reef	93	43	50
LVL1 113-116	Little Conch Reef	75	20	55
NTZ 73-76	Conch Reef SPA	86	74	12
NTZ 77-80	Conch Reef SPA	63	36	27
NTZ 81-84	Conch Reef Research Only	94	61	33
NTZ 85-88	Conch Reef Research Only	84	32	52
LVL1 129-132	Northeast of Conch Reef	63	29	34
LVL1 125-128	Northeast of Conch Reef	71	51	20
LVL1 133-136	Southwest of Pickles Reef	90	40	50
LVL1 137-140	Little Pickles Reef	42	26	16
LVL1 141-144	Pickles Reef	120	88	32
NTZ 97-100	Molasses Reef SPA	87	42	45
NTZ 109-112	Molasses Reef SPA	55	14	41
NTZ 101-104	French Reef SPA	62	25	37
NTZ 105-108	French Reef SPA	73	29	44
LVL1 169-172	Dixie Shoal	100	23	77
LVL1 173-176	Dixie Shoal	90	63	27
NTZ 89-92	Grecian Rocks SPA	62	15	47
NTZ 93-96	Grecian Rocks SPA	70	23	47
LVL1 177-180	Little Grecian Rocks	68	27	41
LVL1 181-184	North-North Dry Rocks	84	25	59
LVL1 153-156	South of Elbow Reef SPA	74	36	38
NTZ 121-124	Elbow Reef SPA	79	35	44
NTZ 125-128	Elbow Reef SPA	96	28	68
LVL1 145-148	South of Carysfort SPA	59	24	35
LVL1 149-152	South of Carysfort SPA	75	18	57
NTZ 113-116	Carysfort/S. Carysfort SPA	60	19	41
NTZ 117-120	Carysfort/S. Carysfort SPA	75	38	37
LVL1 157-160	North of Carysfort SPA	85	25	60
LVL1 161-164	North of Carysfort SPA	70	28	42
LVL1 165-168	North of Carysfort SPA	71	40	31
TOTAL	**80 blocks**	**5545**	**2322**	**3223**

NURC/UNCW **Scleractinian Overgrowth** **Overgrowth** **Level II Zone Monitoring**

Block Number	General Location	Algae	Sponges	Octocorals	*Palythoa*	Other
LVL1 1-4	Western Dry Rocks	3	0	0	0	0
LVL1 5-8	Western Dry Rocks	1	1	0	0	0
NTZ 1-4	Sand Key SPA	5	0	0	0	1
NTZ 5-8	Sand Key SPA	5	0	0	0	0
NTZ 9-12	Western Sambo SPA	0	2	0	0	0
NTZ 13-16	Western Sambo SPA	2	2	0	0	0
LVL1 9-12	Middle Sambo Reef	4	0	0	0	0
LVL1 13-16	Middle Sambo Reef	6	1	1	0	0
NTZ 17-20	Eastern Sambo SPA	9	1	1	0	0
NTZ 21-24	Eastern Sambo SPA	8	0	0	0	0
LVL1 17-20	Maryland Shoal	4	0	0	1	0
LVL1 21-24	West of American Shoal	6	0	0	0	0
LVL1 37-40	West of American Shoal	1	1	0	0	0
LVL1 41-44	American Shoal	2	1	0	0	0
LVL1 25-28	American Shoal	2	0	0	0	0
LVL1 29-32	Southwestern Looe Key	2	1	0	0	0
NTZ 29-32	Looe Key SPA	5	1	0	0	0
NTZ 25-28	Looe Key SPA	1	3	0	2	0
LVL1 45-48	Southwest of Looe Key RO	14	21	0	2	5
LVL1 49-52	West of Looe Key RO	9	8	0	0	0
NTZ 33-36	Looe Key Research Only	13	10	0	1	0
NTZ 37-40	Looe Key Research Only	11	11	0	5	1
LVL1 33-36	West of Big Pine Shoal	3	1	0	0	0
LVL1 57-60	South of Big Pine Key	1	0	0	0	0
LVL1 61-64	Southeast of Big Pine Key	2	0	0	0	0
LVL1 65-68	West of Sombrero Reef	0	0	0	0	0
NTZ 53-56	Sombrero Reef SPA	7	1	0	2	1
NTZ 45-48	Sombrero Reef SPA	0	0	0	0	0
NTZ 41-44	Sombrero Reef SPA	0	0	0	0	0
NTZ 49-52	Sombrero Reef SPA	1	1	0	2	0
LVL1 53-56	Delta Shoal	4	0	0	0	0
LVL1 117-120	East of Sombrero Reef	6	2	0	0	0
LVL1 69-72	South of Coffin's Patch	0	1	0	0	0
LVL1 73-76	Tennessee Light	1	2	0	0	0
LVL1 77-80	Tennessee Light	5	2	0	1	0
NTZ 61-64	Tennessee Reef RO	11	6	0	2	0
NTZ 57-60	Tennessee Reef RO	11	9	0	0	0
LVL1 81-84	Northeast of Tennessee Light	2	3	0	0	0
LVL1 85-88	Between Alligator & Tennessee	6	1	0	0	0
LVL1 89-92	West of Alligator Light	1	0	0	0	0
NTZ 65-68	Alligator SPA	0	0	0	0	0
NTZ 69-72	Alligator SPA	6	1	0	0	0
LVL1 97-100	Northeast of Alligator Light	0	0	0	0	0
LVL1 109-112	Crocker Reef	1	2	0	0	0
LVL1 121-124	Crocker Reef	1	0	0	0	0
LVL1 101-104	Southwest of Davis Reef	0	0	0	0	0
NTZ 133-136	Davis Reef SPA	1	0	0	0	0
NTZ 129-132	Davis Reef SPA	0	0	0	0	0
LVL1 93-96	Outside of Davis SPA	3	1	0	0	0
LVL1 105-108	Little Conch Reef	3	0	0	0	0
LVL1 113-116	Little Conch Reef	4	0	0	0	0
NTZ 73-76	Conch Reef SPA	3	1	0	0	0
NTZ 77-80	Conch Reef SPA	4	0	0	0	0
NTZ 81-84	Conch Reef Research Only	0	2	0	0	0
NTZ 85-88	Conch Reef Research Only	2	2	0	0	0
LVL1 129-132	Northeast of Conch Reef	0	2	0	0	0
LVL1 125-128	Northeast of Conch Reef	2	1	0	0	0
LVL1 133-136	Southwest of Pickles Reef	1	1	0	0	0
LVL1 137-140	Little Pickles Reef	1	0	0	0	0
LVL1 141-144	Pickles Reef	3	2	0	0	0
NTZ 97-100	Molasses Reef SPA	5	1	0	1	0

NTZ 97-100	Molasses Reef SPA	1	0	0	0	0
NTZ 101-104	French Reef SPA	3	0	0	0	0
NTZ 105-108	French Reef SPA	6	0	0	1	0
LVL1 169-172	Dixie Shoal	4	0	0	0	0
LVL1 173-176	Dixie Shoal	0	0	0	0	0
NTZ 89-92	Grecian Rocks SPA	4	1	0	1	0
NTZ 93-96	Grecian Rocks SPA	1	2	0	0	0
LVL1 177-180	Little Grecian Rocks	0	0	0	0	0
LVL1 181-184	North-North Dry Rocks	0	0	0	0	0
LVL1 153-156	South of Elbow Reef SPA	1	0	0	0	0
NTZ 121-124	Elbow Reef SPA	1	1	0	0	1
NTZ 125-128	Elbow Reef SPA	0	1	0	0	0
LVL1 145-148	South of Carysfort SPA	0	0	0	0	0
LVL1 149-152	South of Carysfort SPA	0	0	0	0	0
NTZ 113-116	Carysfort/S. Carysfort SPA	0	0	0	0	0
NTZ 117-120	Carysfort/S. Carysfort SPA	0	0	0	0	0
LVL1 157-160	North of Carysfort SPA	0	0	0	0	0
LVL1 161-164	North of Carysfort SPA	0	0	0	0	0
LVL1 165-168	North of Carysfort SPA	0	0	0	0	0
TOTAL	**80 blocks**	**235**	**114**	**2**	**21**	**9**

NURC/UNCW **Scleractinian Overgrowth** **Level II Zone Monitoring**

General Location	Total
Western Dry Rocks	3
Western Dry Rocks	2
Sand Key SPA	6
Sand Key SPA	5
Western Sambo SPA	2
Western Sambo SPA	4
Middle Sambo Reef	4
Middle Sambo Reef	8
Eastern Sambo SPA	11
Eastern Sambo SPA	8
Maryland Shoal	5
West of American Shoal	6
West of American Shoal	2
American Shoal	3
American Shoal	2
Southwestern Looe Key	3
Looe Key SPA	6
Looe Key SPA	6
Southwest of Looe Key RO	42
West of Looe Key RO	17
Looe Key Research Only	24
Looe Key Research Only	28
West of Big Pine Shoal	4
South of Big Pine Key	1
Southeast of Big Pine Key	2
West of Sombrero Reef	0
Sombrero Reef SPA	11
Sombrero Reef SPA	0
Sombrero Reef SPA	0
Sombrero Reef SPA	4
Delta Shoal	4
East of Sombrero Reef	8
South of Coffin's Patch	1
Tennessee Light	3
Tennessee Light	8
Tennessee Reef RO	19
Tennessee Reef RO	20
Northeast of Tennessee Light	5
Between Alligator & Tennessee	7
West of Alligator Light	1
Alligator SPA	0
Alligator SPA	7
Northeast of Alligator Light	0
Crocker Reef	3
Crocker Reef	1
Southwest of Davis Reef	0
Davis Reef SPA	1
Davis Reef SPA	0
Outside of Davis SPA	4
Little Conch Reef	3
Little Conch Reef	4
Conch Reef SPA	4
Conch Reef SPA	4
Conch Reef Research Only	2
Conch Reef Research Only	4
Northeast of Conch Reef	2
Northeast of Conch Reef	3
Southwest of Pickles Reef	2
Little Pickles Reef	1
Pickles Reef	5
Molasses Reef SPA	7

Molasses Reef SPA	1
French Reef SPA	3
French Reef SPA	7
Dixie Shoal	4
Dixie Shoal	0
Grecian Rocks SPA	6
Grecian Rocks SPA	3
Little Grecian Rocks	0
North-North Dry Rocks	0
South of Elbow Reef SPA	1
Elbow Reef SPA	3
Elbow Reef SPA	1
South of Carysfort SPA	0
South of Carysfort SPA	0
Carysfort/S. Carysfort SPA	0
Carysfort/S. Carysfort SPA	0
North of Carysfort SPA	0
North of Carysfort SPA	0
North of Carysfort SPA	0
80 blocks	**381**

NURC/UNCW **Scleractinian Bleaching** **Level II Zone Monitoring**

Block Number	General Location	Bleaching Category: slightly pale	partially pale	pale	partially bleached	bleached-mottled	bleached	Total
LVL1 1-4	Western Dry Rocks	0	0	1	0	0	0	1
LVL1 5-8	Western Dry Rocks	1	1	1	0	0	0	3
NTZ 1-4	Sand Key SPA	1	7	1	1	2	0	12
NTZ 5-8	Sand Key SPA	2	4	3	1	0	0	10
NTZ 9-12	Western Sambo SPA	1	1	2	0	0	0	4
NTZ 13-16	Western Sambo SPA	3	3	2	0	0	0	8
LVL1 9-12	Middle Sambo Reef	0	2	0	0	0	0	2
LVL1 13-16	Middle Sambo Reef	1	0	1	0	0	0	2
NTZ 17-20	Eastern Sambo SPA	2	2	6	0	0	0	10
NTZ 21-24	Eastern Sambo SPA	2	3	12	0	0	0	17
LVL1 17-20	Maryland Shoal	0	2	12	0	0	0	14
LVL1 21-24	West of American Shoal	2	2	5	1	0	1	11
LVL1 37-40	West of American Shoal	0	0	3	0	0	0	3
LVL1 41-44	American Shoal	0	0	4	0	0	0	4
LVL1 25-28	American Shoal	0	0	2	0	0	0	2
LVL1 29-32	Southwestern Looe Key	3	2	15	2	0	0	22
NTZ 29-32	Looe Key SPA	6	11	12	1	1	0	31
NTZ 25-28	Looe Key SPA	24	11	23	4	2	0	64
LVL1 45-48	Southwest of Looe Key RO	1	1	7	2	0	0	11
LVL1 49-52	West of Looe Key RO	2	5	6	0	2	0	15
NTZ 33-36	Looe Key Research Only	0	2	6	0	1	0	9
NTZ 37-40	Looe Key Research Only	1	12	10	3	2	0	28
LVL1 33-36	West of Big Pine Shoal	4	0	6	1	0	0	11
LVL1 57-60	South of Big Pine Key	3	0	4	0	0	0	7
LVL1 61-64	Southeast of Big Pine Key	3	1	11	2	0	0	17
LVL1 65-68	West of Sombrero Reef	0	0	7	0	0	0	7
NTZ 53-56	Sombrero Reef SPA	9	4	21	1	0	0	35
NTZ 45-48	Sombrero Reef SPA	8	0	7	1	0	0	16
NTZ 41-44	Sombrero Reef SPA	4	1	1	0	0	0	6
NTZ 49-52	Sombrero Reef SPA	7	3	12	4	0	0	26
LVL1 53-56	Delta Shoal	0	0	0	0	4	0	4
LVL1 117-120	East of Sombrero Reef	11	0	15	0	0	0	26
LVL1 69-72	South of Coffin's Patch	1	0	12	0	0	0	13
LVL1 73-76	Tennessee Light	2	0	10	0	0	0	12
LVL1 77-80	Tennessee Light	3	0	22	0	0	0	25
NTZ 61-64	Tennessee Reef RO	7	8	19	4	0	1	39
NTZ 57-60	Tennessee Reef RO	13	2	27	1	0	1	44
LVL1 81-84	Northeast of Tennessee Light	7	0	24	0	0	0	31
LVL1 85-88	Between Alligator & Tennessee	3	2	16	0	0	0	21
LVL1 89-92	West of Alligator Light	2	1	4	0	0	0	7
NTZ 65-68	Alligator SPA	6	1	8	1	0	0	16
NTZ 69-72	Alligator SPA	7	1	16	1	0	0	25
LVL1 97-100	Northeast of Alligator Light	4	0	7	1	0	0	12
LVL1 109-112	Crocker Reef	0	2	3	3	1	1	10
LVL1 121-124	Crocker Reef	8	1	0	0	0	1	10

LVL1 101-104	Northwest of Davis Reef	3	0	1	0	0	0	4
NTZ 133-136	Davis Reef SPA	8	0	13	1	0	2	24
NTZ 129-132	Davis Reef SPA	9	1	6	0	0	0	16
LVL1 93-96	Outside of Davis SPA	13	4	9	1	0	1	28
LVL1 105-108	Little Conch Reef	13	4	14	2	0	0	33
LVL1 113-116	Little Conch Reef	13	3	9	6	0	0	31
NTZ 73-76	Conch Reef SPA	1	1	6	0	0	0	8
NTZ 77-80	Conch Reef SPA	2	2	10	1	0	0	15
NTZ 81-84	Conch Reef Research Only	10	0	5	3	2	0	20
NTZ 85-88	Conch Reef Research Only	15	3	7	5	0	0	30
LVL1 129-132	Northeast of Conch Reef	8	3	8	7	0	0	26
LVL1 125-128	Northeast of Conch Reef	6	1	5	0	0	0	12
LVL1 133-136	Southwest of Pickles Reef	10	0	10	8	0	1	29
LVL1 137-140	Little Pickles Reef	4	0	1	4	0	0	9
LVL1 141-144	Pickles Reef	13	2	9	4	0	0	28
NTZ 97-100	Molasses Reef SPA	4	4	1	6	0	0	15
NTZ 109-112	Molasses Reef SPA	8	3	4	7	0	0	22
NTZ 101-104	French Reef SPA	5	9	5	8	0	0	27
NTZ 105-108	French Reef SPA	7	4	5	7	0	0	23
LVL1 169-172	Dixie Shoal	4	3	6	8	0	0	21
LVL1 173-176	Dixie Shoal	3	1	10	2	0	0	16
NTZ 89-92	Grecian Rocks SPA	8	6	2	0	0	0	16
NTZ 93-96	Grecian Rocks SPA	2	0	1	4	0	0	7
LVL1 177-180	Little Grecian Rocks	0	6	2	0	0	0	8
LVL1 181-184	North-North Dry Rocks	9	2	9	4	0	0	24
LVL1 153-156	South of Elbow Reef SPA	7	7	3	10	0	0	27
NTZ 121-124	Elbow Reef SPA	2	8	19	3	0	0	32
NTZ 125-128	Elbow Reef SPA	7	3	9	34	0	0	53
LVL1 145-148	South of Carysfort SPA	10	6	4	4	0	0	24
LVL1 149-152	South of Carysfort SPA	8	1	4	10	0	0	23
NTZ 113-116	Carysfort/S. Carysfort SPA	3	1	9	6	0	0	19
NTZ 117-120	Carysfort/S. Carysfort SPA	10	0	10	6	0	0	26
LVL1 157-160	North of Carysfort SPA	9	8	15	21	0	0	53
LVL1 161-164	North of Carysfort SPA	11	6	18	9	0	0	44
LVL1 165-168	North of Carysfort SPA	7	3	5	6	0	0	21
TOTAL	**80 blocks**	**416**	**203**	**639**	**232**	**17**	**9**	**1516**

		TYPE OF DISEASE				
Block #	**General Location**	**White Plague Type II**	**Black Band Disease**	**Yellow Band Disease**	**Dark Spot Disease**	**Dead White Skeleton**
LVL1 1-4	Western Dry Rocks					1
NTZ 13-16	Middle Sambo Reef					1
NTZ 17-20	Eastern Sambo SPA				1	
NTZ 21-24	Eastern Sambo SPA	1				
LVL1 17-20	Maryland Shoal			1		
LVL1 21-24	West of American Shoal			1		
NTZ 29-32	Looe Key SPA		1	5		1
NTZ 33-36	Looe Key Research Only					1
LVL1 61-64	Southeast of Big Pine Key					1
LVL1 65-68	West of Sombrero Reef				1	
NTZ 53-56	Sombrero Reef SPA	1				
LVL1 53-56	Delta Shoal			1		
LVL1 117-120	East of Sombrero Reef				1	
NTZ 77-80	Tennessee Light					1
NTZ 57-60	Tennessee Reef RO				4	
NTZ 61-64	Tennessee Reef RO				1	
NTZ 69-72	Alligator SPA					1
LVL1 121-124	Crocker Reef					1
NTZ 129-132	Davis Reef SPA		1			
LVL1 105-108	Little Conch Reef					1
LVL1 113-116	Little Conch Reef					1
NTZ 81-84	Conch Reef Research Only					1
NTZ 85-88	Conch Reef Research Only					1
LVL1 133-136	Southwest of Pickles Reef				2	
NTZ 97-100	Molasses Reef SPA					1
NTZ 109-112	Molasses Reef SPA				1	
NTZ 105-108	French Reef SPA				1	1
LVL1 169-172	Dixie Shoal	1			1	1
NTZ 89-92	Grecian Rocks SPA					1
LVL1 177-180	Little Grecian Rocks					1
LVL1 181-184	North-North Dry Rocks					1
NTZ 125-128	Elbow Reef SPA					1
LVL1 149-152	South of Carysfort SPA				1	
LVL1 161-164	North of Carysfort SPA				3	
TOTAL	**34 blocks**	**3**	**2**	**8**	**17**	**19**

TOTAL
1
1
1
1
1
1
7
1
1
1
1
1
1
1
4
1
1
1
1
1
1
1
1
2
1
1
2
3
1
1
1
1
1
3
49

Block Number	General Location	No. Transects	Area (m^2)	*D. antillarum*	Size Range (cm)	*E. viridis*	Size Range (cm)
LVL1 1-4	Western Dry Rocks	8	80	0		0	
LVL1 5-8	Western Dry Rocks	8	80	0		0	
NTZ 1-4	Sand Key SPA	8	80	0		0	
NTZ 5-8	Sand Key SPA	8	80	0		0	
NTZ 9-12	Western Sambo SPA	8	80	0		0	
NTZ 13-16	Western Sambo SPA	8	80	0		0	
LVL1 9-12	Middle Sambo Reef	8	80	0		0	
LVL1 13-16	Middle Sambo Reef	8	80	0		0	
NTZ 17-20	Eastern Sambo SPA	8	80	0		0	
NTZ 21-24	Eastern Sambo SPA	8	80	0		0	
LVL1 17-20	Maryland Shoal	8	80	1	2.0	0	
LVL1 21-24	West of American Shoal	8	80	0		0	
LVL1 37-40	West of American Shoal	8	80	0		0	
LVL1 41-44	American Shoal	8	80	1	2.0	0	
LVL1 25-28	American Shoal	8	80	0		0	
LVL1 29-32	Southwestern Looe Key	8	80	0		0	
NTZ 29-32	Looe Key SPA	8	80	0		0	
NTZ 25-28	Looe Key SPA	8	80	0		0	
LVL1 45-48	Southwest of Looe Key RO	8	80	0		0	
LVL1 49-52	West of Looe Key RO	8	80	0		0	
NTZ 33-36	Looe Key Research Only	8	80	2	2.0-2.5	0	
NTZ 37-40	Looe Key Research Only	8	80	0		0	
LVL1 33-36	West of Big Pine Shoal	8	80	0		0	
LVL1 57-60	South of Big Pine Key	8	80	0		0	
LVL1 61-64	Southeast of Big Pine Key	8	80	0		0	
LVL1 65-68	West of Sombrero Reef	8	80	1	1.5	0	
NTZ 53-56	Sombrero Reef SPA	8	80	0		0	
NTZ 45-48	Sombrero Reef SPA	8	80	0		0	
NTZ 41-44	Sombrero Reef SPA	8	80	0		0	
NTZ 49-52	Sombrero Reef SPA	8	80	0		0	
LVL1 53-56	Delta Shoal	8	80	0		0	
LVL1 117-120	East of Sombrero Reef	8	80	0		0	
LVL1 69-72	South of Coffin's Patch	8	80	0		0	
LVL1 73-76	Tennessee Light	8	80	0		0	
LVL1 77-80	Tennessee Light	8	80	4	2.0-3.5	0	
NTZ 61-64	Tennessee Reef RO	8	80	0		0	
NTZ 57-60	Tennessee Reef RO	8	80	0		0	
LVL1 81-84	Northeast of Tennessee Light	8	80	0		0	
LVL1 85-88	Between Alligator & Tennessee	8	80	0		0	
LVL1 89-92	West of Alligator Light	8	80	1	1.5	0	
NTZ 65-68	Alligator SPA	8	80	0		0	
NTZ 69-72	Alligator SPA	8	80	0		0	
LVL1 97-100	Northeast of Alligator Light	8	80	0		0	
LVL1 109-112	Crocker Reef	8	80	1	1.5	0	
LVL1 121-124	Crocker Reef	8	80	0		0	
LVL1 101-104	Southwest of Davis Reef	8	80	0		0	
NTZ 133-136	Davis Reef SPA	8	80	0		0	
NTZ 129-132	Davis Reef SPA	8	80	0		0	
LVL1 93-96	Outside of Davis SPA	8	80	2	1.5	0	
LVL1 105-108	Little Conch Reef	8	80	0		0	
LVL1 113-116	Little Conch Reef	8	80	0		0	
NTZ 73-76	Conch Reef SPA	8	80	1	1.5	0	
NTZ 77-80	Conch Reef SPA	8	80	0		0	
NTZ 81-84	Conch Reef Research Only	8	80	0		0	
NTZ 85-88	Conch Reef Research Only	8	80	0		0	
LVL1 125-128	Northeast of Conch Reef	8	80	0		0	
LVL1 129-132	Northeast of Conch Reef	8	80	0		0	
LVL1 133-136	Southwest of Pickles Reef	8	80	0		0	
LVL1 137-140	Little Pickles Reef	8	80	0		0	
LVL1 141-144	Pickles Reef	8	80	0		0	
NTZ 97-100	Molasses Reef SPA	8	80	0		0	
NTZ 109-112	Molasses Reef SPA	8	80	0		0	
NTZ 101-104	French Reef SPA	8	80	0		0	
NTZ 105-108	French Reef SPA	8	80	0		0	
LVL1 169-172	Dixie Shoal	8	80	1	5.0	0	
LVL1 173-176	Dixie Shoal	8	80	0		0	
NTZ 89-92	Grecian Rocks SPA	8	80	0		0	
NTZ 93-96	Grecian Rocks SPA	8	80	0		0	
LVL1 177-180	Little Grecian Rocks	8	80	0		0	
LVL1 181-184	North-North Dry Rocks	8	80	0		0	
LVL1 153-156	South of Elbow Reef SPA	8	80	0		0	

NTZ 121-124	Elbow Reef SPA	8	80	0		1	1.0
NTZ 125-128	Elbow Reef SPA	8	80	0		0	
LVL1 145-148	South of Carysfort SPA	8	80	0		0	
LVL1 149-152	South of Carysfort SPA	8	80	0		0	
NTZ 113-116	Carysfort/S. Carysfort SPA	8	80	0		0	
NTZ 117-120	Carysfort/S. Carysfort SPA	8	80	0		0	
LVL1 157-160	North of Carysfort SPA	8	80	0		1	0.5
LVL1 161-164	North of Carysfort SPA	8	80	0		0	
LVL1 165-168	North of Carysfort SPA	8	80	1	1.2	0	
TOTAL	**80 blocks**	**640**	**6400**	**16**	**1.5-5.0 (range)**	**2**	**0.5-1.0 (range)**

E. tribuloides	Size Range (cm)
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
1	1.5
1	3.0
1	2.0
1	2.5
0	
2	2.0-3.0
4	2.0-3.0
0	
0	
0	
0	
1	2.0
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
2	2.0
1	1.5
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
2	2.0
0	
1	1.5
2	1.5
0	
0	
1	1.0
0	
1	2.0
0	
0	
1	1.5
0	
0	
0	
0	
0	
1	0.8
1	1.5
0	
0	
0	
0	
2	1.3-1.4

2	0.6-2.0
1	0.5
1	1.4
1	2.3
0	
0	
3	1.1-1.2
2	0.5-0.8
2	1.0-1.3
38	**0.5-3.0 (range)**

Block Number	General Location	No. Transects	Area (m^2)	*C. gigantea*	*B. annulata*	*R. florida*	*P. caribaeorum*
LVL1 1-4	Western Dry Rocks	8	80		*	*	*
LVL1 5-8	Western Dry Rocks	8	80			*	*
NTZ 1-4	Sand Key SPA	8	80			*	*
NTZ 5-8	Sand Key SPA	8	80			*	*
NTZ 9-12	Western Sambo SPA	8	80			*	*
NTZ 13-16	Western Sambo SPA	8	80			*	*
LVL1 9-12	Middle Sambo Reef	8	80			*	*
LVL1 13-16	Middle Sambo Reef	8	80			*	*
NTZ 17-20	Eastern Sambo SPA	8	80			*	*
NTZ 21-24	Eastern Sambo SPA	8	80			*	*
LVL1 17-20	Maryland Shoal	8	80	*		*	*
LVL1 21-24	West of American Shoal	8	80		*	*	*
LVL1 37-40	West of American Shoal	8	80			*	*
LVL1 41-44	American Shoal	8	80				*
LVL1 25-28	American Shoal	8	80		*		*
LVL1 29-32	Southwestern Looe Key	8	80		*		*
NTZ 29-32	Looe Key SPA	8	80			*	*
NTZ 25-28	Looe Key SPA	8	80			*	*
LVL1 45-48	Southwest of Looe Key RO	8	80	*		*	*
LVL1 49-52	West of Looe Key RO	8	80	*		*	*
NTZ 33-36	Looe Key Research Only	8	80			*	*
NTZ 37-40	Looe Key Research Only	8	80		*	*	*
LVL1 33-36	West of Big Pine Shoal	8	80			*	*
LVL1 57-60	South of Big Pine Key	8	80		2	1	
LVL1 61-64	Southeast of Big Pine Key	8	80				
LVL1 65-68	West of Sombrero Reef	8	80			1	*
NTZ 53-56	Sombrero Reef SPA	8	80			1	*
NTZ 45-48	Sombrero Reef SPA	8	80				*
NTZ 41-44	Sombrero Reef SPA	8	80				*
NTZ 49-52	Sombrero Reef SPA	8	80				*
LVL1 53-56	Delta Shoal	8	80			2	*
LVL1 117-120	East of Sombrero Reef	8	80			2	*
LVL1 69-72	South of Coffin's Patch	8	80			1	*
LVL1 73-76	Tennessee Light	8	80				*
LVL1 77-80	Tennessee Light	8	80		3		*
NTZ 61-64	Tennessee Reef RO	8	80			2	*
NTZ 57-60	Tennessee Reef RO	8	80	1		3	*
LVL1 81-84	Northeast of Tennessee Light	8	80				*
LVL1 85-88	Between Alligator & Tennessee	8	80		1		*
LVL1 89-92	West of Alligator Light	8	80				*
NTZ 65-68	Alligator SPA	8	80		1		*
NTZ 69-72	Alligator SPA	8	80		1		*
LVL1 97-100	Northeast of Alligator Light	8	80		2		*
LVL1 109-112	Crocker Reef	8	80			1	*
LVL1 121-124	Crocker Reef	8	80		1		*
LVL1 101-104	Southwest of Davis Reef	8	80				*
NTZ 133-136	Davis Reef SPA	8	80		1		*
NTZ 129-132	Davis Reef SPA	8	80				*
LVL1 93-96	Outside of Davis SPA	8	80		2		*
LVL1 105-108	Little Conch Reef	8	80		3	2	*
LVL1 113-116	Little Conch Reef	8	80		4		*
NTZ 73-76	Conch Reef SPA	8	80				*
NTZ 77-80	Conch Reef SPA	8	80		1		*
NTZ 81-84	Conch Reef Research Only	8	80			2	*
NTZ 85-88	Conch Reef Research Only	8	80				*
LVL1 125-128	Northeast of Conch Reef	8	80				*
LVL1 129-132	Northeast of Conch Reef	8	80				*
LVL1 133-136	Southwest of Pickles Reef	8	80				*
LVL1 137-140	Little Pickles Reef	8	80		4		*
LVL1 141-144	Pickles Reef	8	80		5		*
NTZ 97-100	Molasses Reef SPA	8	80			21	*
NTZ 109-112	Molasses Reef SPA	8	80		1		*
NTZ 101-104	French Reef SPA	8	80				
NTZ 105-108	French Reef SPA	8	80		3	2	*
LVL1 169-172	Dixie Shoal	8	80		3	3	*
LVL1 173-176	Dixie Shoal	8	80		2	4	*
NTZ 89-92	Grecian Rocks SPA	8	80		3		*
NTZ 93-96	Grecian Rocks SPA	8	80			12	*
LVL1 177-180	Little Grecian Rocks	8	80	2	4	18	*
LVL1 181-184	North-North Dry Rocks	8	80		2	54	*
LVL1 153-156	South of Elbow Reef SPA	8	80				*

NTZ 121-124	Elbow Reef SPA	8	80		1		*
NTZ 125-128	Elbow Reef SPA	8	80		1		*
LVL1 145-148	South of Carysfort SPA	8	80		2	4	*
LVL1 149-152	South of Carysfort SPA	8	80				
NTZ 113-116	Carysfort/S. Carysfort SPA	8	80		3	3	*
NTZ 117-120	Carysfort/S. Carysfort SPA	8	80		1	2	*
LVL1 157-160	North of Carysfort SPA	8	80		1	7	*
LVL1 161-164	North of Carysfort SPA	8	80	1	1	10	*
LVL1 165-168	North of Carysfort SPA	8	80	3	9	5	*
TOTAL	**57 survey blocks**	**456**	**4560**	**7**	**68**	**163**	**Only +/-**

Block Number	General Location	No. Transects	Area (m^2)	*Panulirus argus* (no./80 m^2)
LVL1 1-4	Western Dry Rocks	8	80	
LVL1 5-8	Western Dry Rocks	8	80	
NTZ 1-4	Sand Key SPA	8	80	
NTZ 5-8	Sand Key SPA	8	80	
NTZ 9-12	Western Sambo SPA	8	80	
NTZ 13-16	Western Sambo SPA	8	80	
LVL1 9-12	Middle Sambo Reef	8	80	
LVL1 13-16	Middle Sambo Reef	8	80	
NTZ 17-20	Eastern Sambo SPA	8	80	
NTZ 21-24	Eastern Sambo SPA	8	80	
LVL1 17-20	Maryland Shoal	8	80	
LVL1 21-24	West of American Shoal	8	80	
LVL1 37-40	West of American Shoal	8	80	
LVL1 41-44	American Shoal	8	80	
LVL1 25-28	American Shoal	8	80	
LVL1 29-32	Southwestern Looe Key	8	80	
NTZ 29-32	Looe Key SPA	8	80	
NTZ 25-28	Looe Key SPA	8	80	
LVL1 45-48	Southwest of Looe Key RO	8	80	
LVL1 49-52	West of Looe Key RO	8	80	
NTZ 33-36	Looe Key Research Only	8	80	
NTZ 37-40	Looe Key Research Only	8	80	
LVL1 33-36	West of Big Pine Shoal	8	80	
LVL1 57-60	South of Big Pine Key	8	80	
LVL1 61-64	Southeast of Big Pine Key	8	80	
LVL1 65-68	West of Sombrero Reef	8	80	
NTZ 53-56	Sombrero Reef SPA	8	80	
NTZ 45-48	Sombrero Reef SPA	8	80	
NTZ 41-44	Sombrero Reef SPA	8	80	
NTZ 49-52	Sombrero Reef SPA	8	80	
LVL1 53-56	Delta Shoal	8	80	
LVL1 117-120	East of Sombrero Reef	8	80	
LVL1 69-72	South of Coffin's Patch	8	80	
LVL1 73-76	Tennessee Light	8	80	
LVL1 77-80	Tennessee Light	8	80	
NTZ 61-64	Tennessee Reef RO	8	80	
NTZ 57-60	Tennessee Reef RO	8	80	
LVL1 81-84	Northeast of Tennessee Light	8	80	
LVL1 85-88	Between Alligator & Tennessee	8	80	1
LVL1 89-92	West of Alligator Light	8	80	
NTZ 65-68	Alligator SPA	8	80	1
NTZ 69-72	Alligator SPA	8	80	
LVL1 97-100	Northeast of Alligator Light	8	80	
LVL1 109-112	Crocker Reef	8	80	
LVL1 121-124	Crocker Reef	8	80	
LVL1 101-104	Southwest of Davis Reef	8	80	
NTZ 133-136	Davis Reef SPA	8	80	1
NTZ 129-132	Davis Reef SPA	8	80	
LVL1 93-96	Outside of Davis SPA	8	80	
LVL1 105-108	Little Conch Reef	8	80	
LVL1 113-116	Little Conch Reef	8	80	
NTZ 73-76	Conch Reef SPA	8	80	
NTZ 77-80	Conch Reef SPA	8	80	
NTZ 81-84	Conch Reef Research Only	8	80	
NTZ 85-88	Conch Reef Research Only	8	80	
LVL1 125-128	Northeast of Conch Reef	8	80	
LVL1 129-132	Northeast of Conch Reef	8	80	
LVL1 133-136	Southwest of Pickles Reef	8	80	
LVL1 137-140	Little Pickles Reef	8	80	
LVL1 141-144	Pickles Reef	8	80	
NTZ 97-100	Molasses Reef SPA	8	80	
NTZ 109-112	Molasses Reef SPA	8	80	

NTZ 101-104	French Reef SPA	8	80	1
NTZ 105-108	French Reef SPA	8	80	
LVL1 169-172	Dixie Shoal	8	80	
LVL1 173-176	Dixie Shoal	8	80	
NTZ 89-92	Grecian Rocks SPA	8	80	1
NTZ 93-96	Grecian Rocks SPA	8	80	1
LVL1 177-180	Little Grecian Rocks	8	80	1
LVL1 181-184	North-North Dry Rocks	8	80	1
LVL1 153-156	South of Elbow Reef SPA	8	80	
NTZ 121-124	Elbow Reef SPA	8	80	4
NTZ 125-128	Elbow Reef SPA	8	80	
LVL1 145-148	South of Carysfort SPA	8	80	1
LVL1 149-152	South of Carysfort SPA	8	80	1
NTZ 113-116	Carysfort/S. Carysfort SPA	8	80	
NTZ 117-120	Carysfort/S. Carysfort SPA	8	80	
LVL1 157-160	North of Carysfort SPA	8	80	
LVL1 161-164	North of Carysfort SPA	8	80	
LVL1 165-168	North of Carysfort SPA	8	80	1
TOTAL	**80 survey blocks**	**640**	**6400**	**15**