

IV. Density and size of gorgonians and *Cyphoma* snail predators

Background

Gorgonians (Octocorallia, Alcyonaria) occur at their greatest diversity in the wider Caribbean, often exceeding reef-building corals in species richness and colony density. They often dominate coral reef and hard-bottom communities and their contribution to spatial complexity can be substantial, particularly in sediment-rich areas and on reefs with lower stony coral cover (Wheaton and Jaap 1988; Chiappone and Sullivan 1997). Gorgonian distribution patterns are primarily influenced by physical environmental conditions such as substrate availability, water depth and flow, wave energy, and light intensity. Factors affecting gorgonian population dynamics include recruitment strategies, mortality due to toppling, predation, and disease. Additional factors such as episodic storms, anthropogenic impacts, reef morphology, and geographic setting also contribute to spatial and temporal variability.

Most gorgonian predators, such as ovulid gastropods like the flamingo tongue snail *Cyphoma gibbosum* Linnaeus (Figure 20), cause only partial colony mortality, ranging from consumption of the polyps to rasping of the axial coenochyme, sometimes to the depth of the proteinaceous axis (Harvell and Fenical 1989; Neudecker 1985). Usually found in male and female pairs, *C. gibbosum* is a generalist browser and has been the subject of numerous studies concerned with distribution and gorgonian occupancy patterns in the Caribbean (e.g. Birkeland and Gregory 1975; Hazlett and Bach 1982; Harvell and Suchanek 1987). Several hypotheses have been proposed to explain the factors that control *C. gibbosum* populations in typically prey-rich environments: recruitment limitation (which has yet to be adequately studied), predation by hogfish (*Lachnolaimus maximus*) and other predators (Randall and Warmke 1967; Shoup 1968), gorgonian structural defenses (Lewis and Von Wallis, 1991; Van Alstyne and Paul 1992; West 1997), and chemical defenses (Pawlik et al. 1987; Sammarco and Coll 1992; Pawlik and Fenical 1989; Van Alstyne and Paul 1992). Although food abundance may be expected to lead to significant prey preference, considerable variability exists in observed patterns of gorgonian host occupancy by *C. gibbosum*. These patterns range from preference of several species (Birkeland and Gregory, 1975; Lasker et al. 1988) to occupancy of gorgonian species in proportion to their availability (Kinzie 1970; Harvell and Suchanek 1987). The variability in experimental results may reflect temporal or geographic differences in preferences or variability in prey quality (Lasker et al., 1988). Gorgonian defenses such as sclerite content (Harvell and Suchanek, 1987; Van Alstyne and Paul, 1992; West, 1997) and secondary metabolites (Hazlett and Bach 1982; Pawlik et al. 1987; Sammarco and Coll 1992) do not clearly explain prey utilization patterns. *Cyphoma gibbosum* apparently tolerates high levels of gorgonian terpenes (Vrolijk and Targett 1992) and may sequester these compounds in its mantle, similar to other ovulid gastropods do (Coll et al. 1983).

2008 Survey Results

As a follow-up to similar surveys conducted during 1999-2001 and 2005 in the Florida Keys (Chiappone et al. 2003), we quantified gorgonian numbers and maximum colony heights for all 145 sites visited during 2008. Only branching gorgonians were identified to genus level, with the exception of *Briareum asbestinum* and *Gorgonia ventalina*, and thus the surveys excluded encrusting colonies of *B. asbestinum* and *Erythropodium caribaeorum*. The numbers, shell lengths, and gorgonian host occupation patterns of flamingo-tongue snails were also collected (Figure 20), similar to previous surveys in 2001. Gorgonians and *Cyphoma* snails were enumerated and measured in two 8-m x 1-m belt transects per site and a total area of 2,320 m² was surveyed for these organisms in 2008. Table 6 lists site-level densities for *Cyphoma* snails and total gorgonian densities, while Figures 21-26 illustrate the spatial distribution of total gorgonian densities in the Florida Keys study area. Tables 8-12 provided site-level, habitat, and regional density data by gorgonian genera.

A total of 32,801 branching gorgonians were identified to genus, counted, and measured for maximum colony height. Site-level mean (± 1 SE) colony densities ranged from 0.13 to 46.19 colonies per m² among the 145 sites (Table 6). Offshore patch reefs (18.92 ± 2.13 colonies per m²) and inner line reef tract spur and groove (18.82 ± 2.23) yielded the greatest densities, while mid-channel patch reefs (12.75 ± 2.05) and high-relief spur and groove (10.35 ± 1.25) had the lowest. A total of 43 *Cyphoma* snails, represented by 41 *C. gibbosum* and two *C. signatum*, were recorded, with shell lengths (SL) ranging from 0.4 to 3.2 cm. For *C. gibbosum*, 95% of all individuals were between 2.0 and 3.9 cm SL (Table 7). *C. gibbosum* densities were greatest on offshore patch reefs (0.043 ± 0.017 per m²) and high-relief spur and groove (0.031 ± 0.011) (Table 6). Thus, there was not complete correspondence between total gorgonian and *Cyphoma* snail densities by habitat. Of the 43 *Cyphoma* snails encountered, all were found on living gorgonian hosts (Table 7), representing a 0.13% gorgonian host occupancy percentage, much lower than that reported during 2001 (Chiappone et al. 2003). The most frequently occupied gorgonian genera by *Cyphoma* snails were *Plexaura* (27.9%), *Eunicea* (20.9%), and *Gorgonia* (16.3%). These three genera represented 6.9%, 9.6%, and 14.8% of the total gorgonians sampled, respectively (Tables 8-12), so it appears that some of the gorgonian hosts were occupied by *Cyphoma* disproportionately relative to their abundance (e.g. *Plexaura*, *Eunicea*, *Pseudopterogorgia*), while others were not (e.g. *Gorgonia*).

Regional variations in gorgonian densities and *Cyphoma* densities were evident, but not consistent among the habitats sampled in 2008 (Table 6). Many genera exhibited substantial habitat-level variability in density and height, as well as variability in these metrics among regions and between no-take zones and

reference areas (Tables 8-12). Mid-channel patch reefs in the lower Keys (20.60 ± 3.28 per m^2) yielded the highest densities of gorgonians compared to the upper and especially the middle Keys. Lower Keys sites were also the only mid-channel patch reefs where *Cyphoma* snails were recorded, all of which were encountered in reference areas outside of no-take zones. For offshore patch reefs, total gorgonian densities were roughly similar among the three regions, with mean total gorgonian densities ranging from 15.98 to 20.61 colonies per m^2 . However, 94% of the *Cyphoma* found on offshore patch reefs were documented in the middle and lower Keys. In the lower Keys, *Cyphoma* were only encountered on reference patch reefs outside of no-fishing zones. In high-relief spur and groove, upper Keys sites yielded the greatest mean gorgonian density (15.18 ± 2.17 per m^2), which was 1.7-2.1 times greater than for the middle and lower Keys. For both the upper and lower Keys, the *Cyphoma* snails were only found in reference sites and not within no-fishing zones.

Discussion

During 2001, we assessed *Cyphoma* and gorgonians at 63 sites (Chiappone et al. 2003). Although considerable variability occurred between sites and years, *Cyphoma* densities were similar to those reported by Lasker and Coffroth (1988). In 2008, we found substantially lower snail densities compared to 2001, although there were similar patterns relative to habitat type and management zone. Chiappone et al. 2003 found that the snails exhibited a clumped distribution on gorgonian hosts, mirroring previous results from the Virgin Islands (Birkeland and Gregory 1975; Hazlett and Bach 1982) and Panama (Lasker and Coffroth 1988). Although more solitary individuals were found than pairs or aggregations, it is possible that these individuals were searching for mates (Ghiselin and Wilson 1966). Lasker and Coffroth (1988) proposed that the clumped distribution of *C. gibbosum* could be due to intra-colony variation in secondary metabolite content of gorgonians, while Gerhart (1986) stated that gregariousness is due to mucous trail following. All of the snails encountered during 2008 were found on gorgonian hosts. Birkeland and Gregory (1975) found only 1 % of individuals on the substratum, and Harvell and Suchanek (1987) showed that *C. gibbosum* generally avoids even the basal regions of gorgonians.

Our results indicate that Florida Keys gorgonian hosts are readily available and that *C. gibbosum* is probably not food-limited. The distribution patterns of *C. gibbosum* are produced by at least two independent processes: the movement of individuals to colonies (Lasker et al. 1988) and the time spent on a colony (Gerhart 1986; Lasker and Coffroth 1988). Considering the differences in gorgonian density patterns and management histories of the various regions surveyed in the Florida Keys, one may expect differences in snail densities among habitats, regions, and management zones. More snails were found on offshore patch reef and platform margin spur and groove sites. Snail densities did not correspond exactly

with total gorgonian densities, and this lack of correspondence, while not unexpected in a prey-rich environment, indicates that factors in addition to host availability affect *C. gibbosum* densities. For example, if fishing affects snail predators (such as hogfish, *Lachnolaimus maximus*) (Randall and Warmke 1967), it is possible that higher snail densities within the spur and groove habitat in particular regions could be explained by protection from fishing. Snail densities were lower in the upper Keys, which have been long-protected from spear-fishing, than in the lower Keys. This is interesting because spear-fishing is the preferred method for capturing *L. maximus* in the Florida Keys (Harper et al. 2000), and most snails within the upper Keys region were recorded from three sites at Pickles Reef, just southwest of the boundaries of Key Largo National Marine Sanctuary, where spear-fishing is permitted. Fishery-independent surveys of *L. maximus* during 2001 indicated a mean density of 0.122 individuals per sample in spur and groove, and 1.38 individuals per sample in hard-bottom, a pattern inversely related to *C. gibbosum* densities documented during 2001 (D. McClellan, NOAA/NMFS, pers. comm.; Chiappone et al. 2003). Similar patterns were observed in the spur and groove habitat between fished and protected sites for the lower Keys, where *C. gibbosum* densities were greater in fished sites and *L. maximus* densities were greater in protected sites.

Chiappone et al. (2003) found that most gorgonians were occupied in proportion to their abundance or were under-occupied by snails in their 2001 surveys, while a few species were occupied in disproportion to their availability, indicating possible host preference. Chiappone et al. (2003) found that the plexaurids *Eunicea tourneforti*, *Plexaura flexuosa*, *P. homomalla*, *Plexaurella dichotoma*, and *Pseudoplexaura porosa* were occupied preferentially relative to their densities. These results agree somewhat with previous studies, although increasing densities of these gorgonian hosts did not correlate with increased snail densities. The most common gorgonians occupied in Panama were *P. homomalla*, *Pseudoplexaura* spp., and *Pseudopterogorgia* spp. (Lasker and Coffroth 1988; Lasker et al. 1988), and Lasker and Coffroth (1988) found a strong bias for sea plumes and lesser preferences for other species. Strong preferences for Gorgoniidae, especially sea plumes and *G. ventalina*, were also documented in the Virgin Islands (Birkeland and Gregory 1975; Harvell and Suchanek 1987), but in the Florida Keys there was no strong preference for Gorgoniidae despite relatively high densities. Several mechanisms have been proposed to explain the host occupancy patterns of *C. gibbosum*, principally among them structural and chemical defenses of gorgonians. Harvell and Suchanek (1987) observed that foraging times were negatively correlated with the proportion and size of component sclerites in gorgonians. *Cyphoma gibbosum* seems capable of tolerating the unusually high levels of gorgonian chemical defenses (Pawlik et al. 1987; Sammarco and Coll 1992). For example, this snail is immune to prostaglandins produced by *Plexaura homomalla* (Gerhart 1986), one of the commonly occupied gorgonians in the Florida Keys.

Previous studies have concluded that predation, especially by *C. gibbosum*, imposes a minor effect on gorgonians relative to other factors such as colony toppling during storms, structural failure of the underlying substratum, and sediment scouring and burial. Predation by *C. gibbosum* played a negligible role in gorgonian mortality during a five-year study at two reefs on the southwest coast of Puerto Rico, even though individuals were noted frequently (Yoshioka and Yoshioka 1991). In the Florida Keys, of the 9,911 colonies assessed during 2001, approximately 0.5% was occupied by *C. gibbosum* (Chiappone et al. 2003). In 2008, over 32,000 colonies were counted, but only 0.13% was occupied by snails. Although lower occupancy rates were found in 2008, both sampling periods (2001 and 2008) yielded similar distribution patterns in snail host occupation, especially between no-fishing zones and reference areas. Targeted studies on the relationships between predators and prey, such as hogfish (*Lachnolaimus maximus*) and *C. gibbosum*, including detailed censuses of fishes and snails in multiple habitat types, and experimental work to document predation, will provide important insight into how changing fish communities in marine reserves help to structure the benthos. Other factors that may influence patterns of ovulid gastropods in the Florida Keys, and thus warrant further study, include recruitment variability and removal for by recreational and commercial aquarium (marine ornamental) collectors.

Figure 20. Flamingo-tongue snails (*Cyphoma gibbosum*) surveyed for density, size, and gorgonian host occupation patterns in the Florida Keys during 2008.

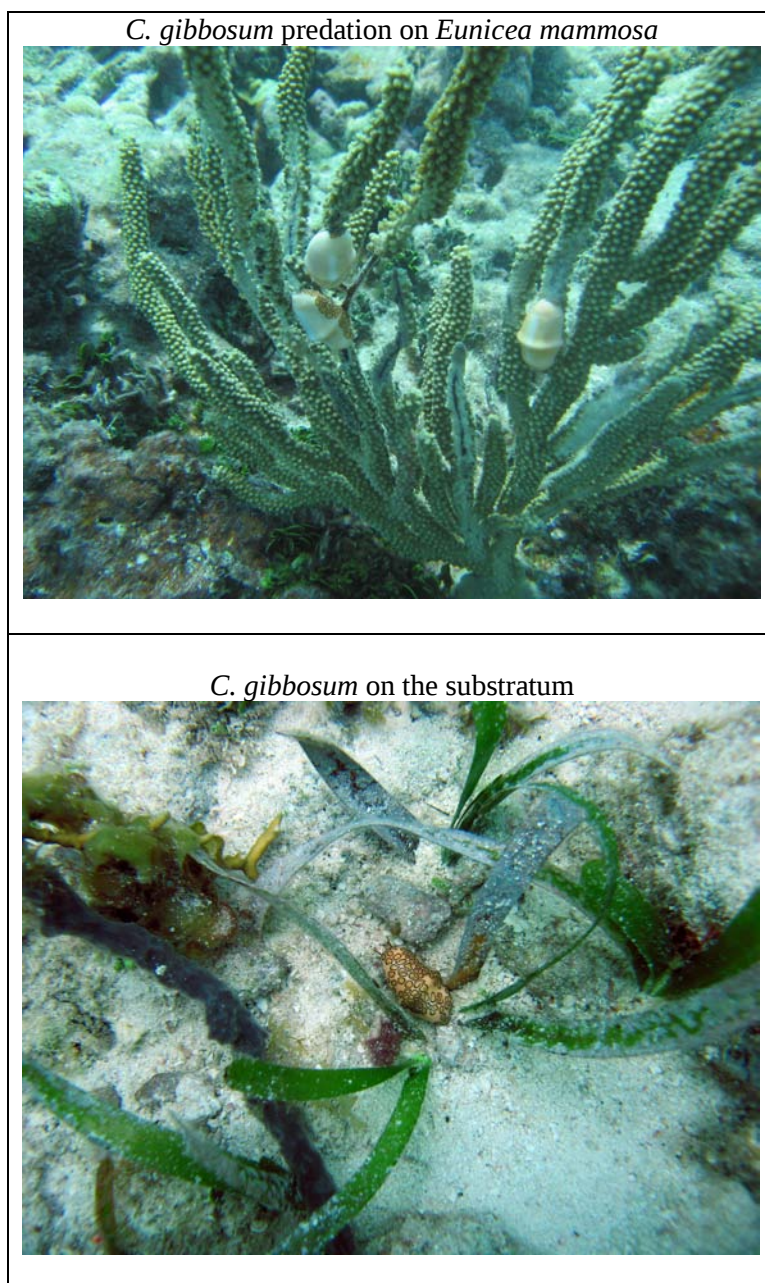


Figure 21. Total gorgonian densities (no. colonies per m²) in the upper Florida Keys (top) and from the southern BNP boundary to Carysfort Reef (bottom) during June-September 2008.

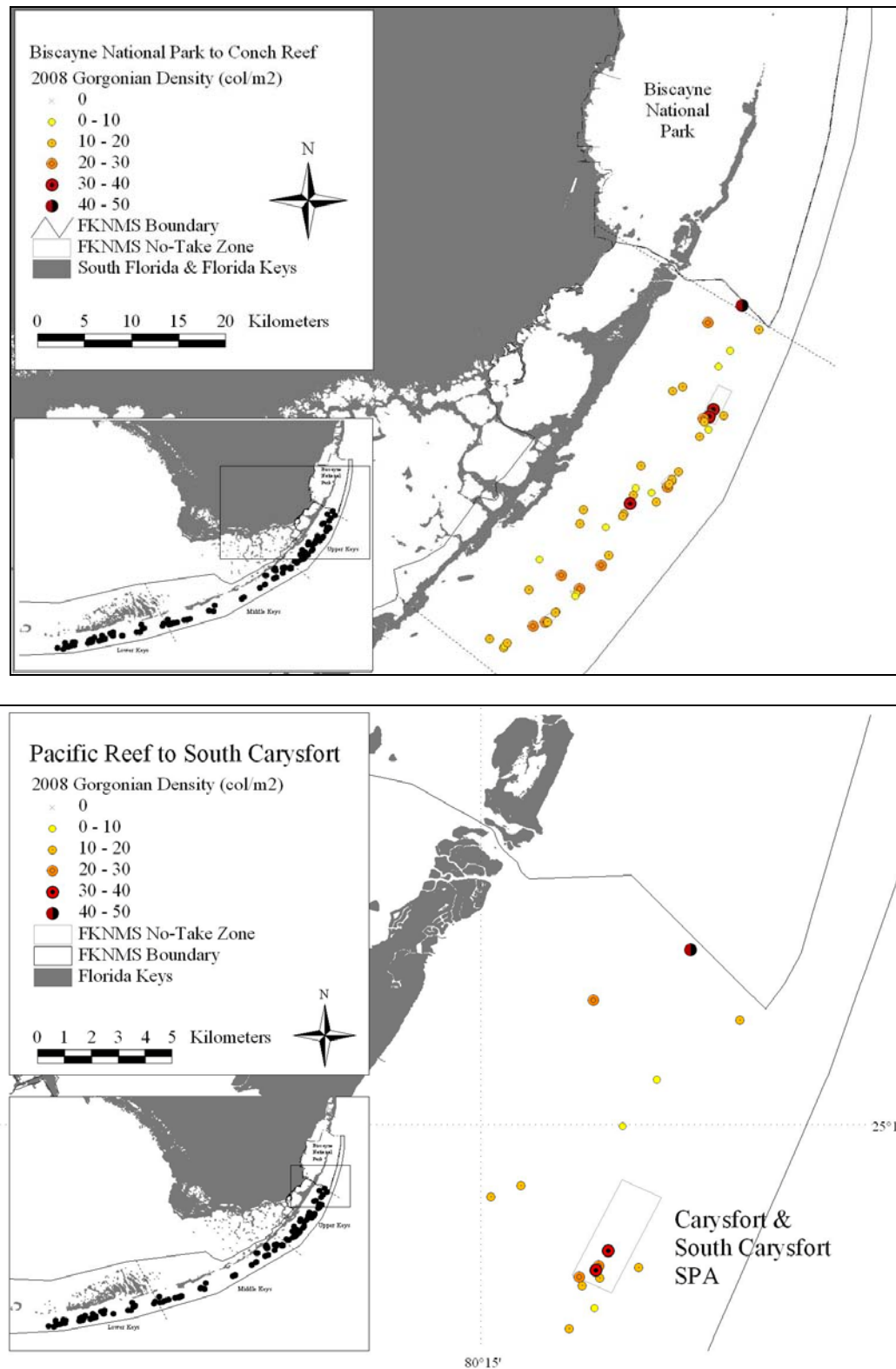


Figure 22. Total gorgonian densities (no. colonies per m²) in the upper Florida Keys from Elbow Reef to Pickles Reef (top) and in the middle Florida Keys (bottom) during June-September 2008.

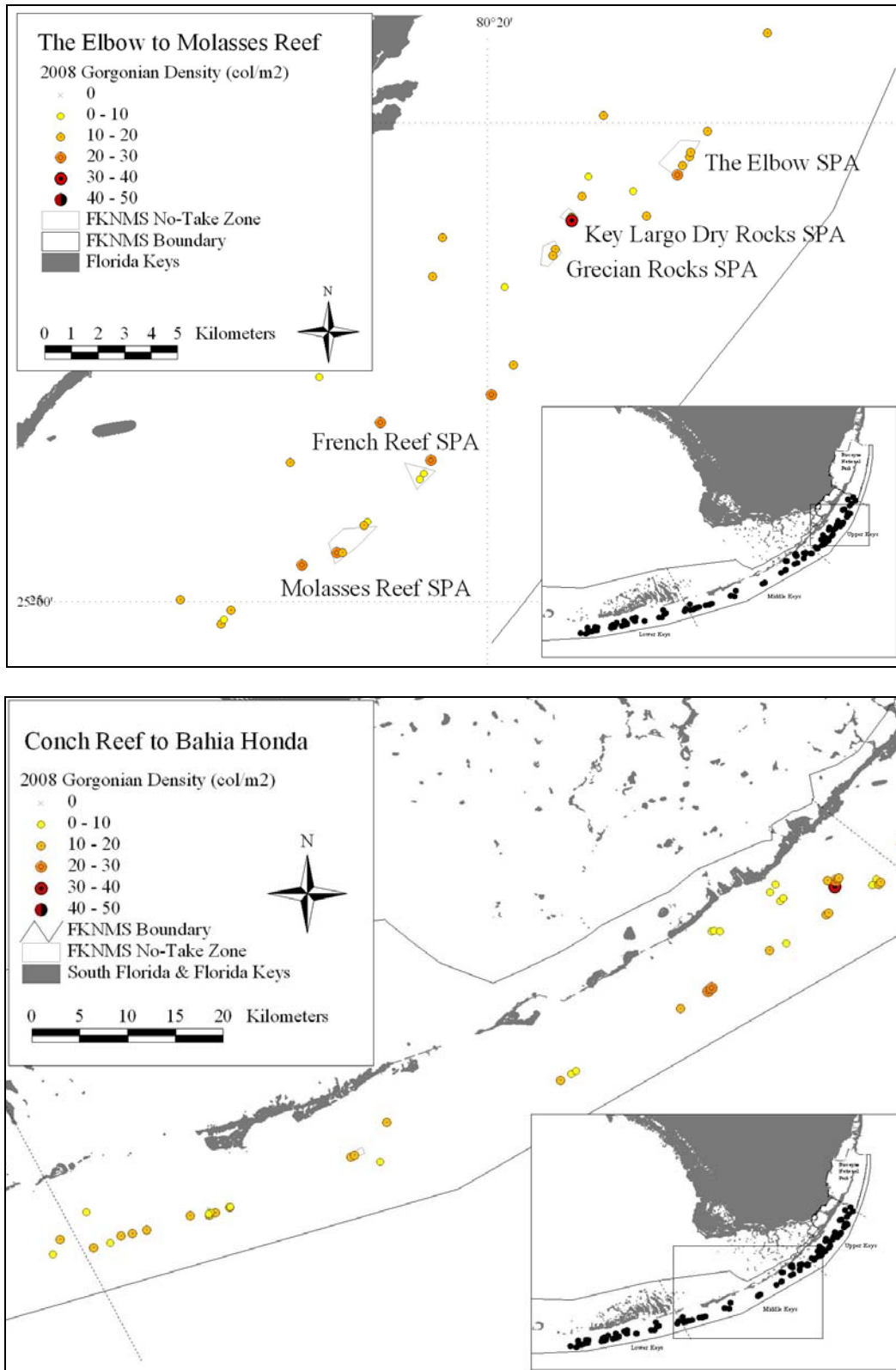


Figure 23. Total gorgonian densities (no. colonies per m²) in the middle Florida Keys from Conch Reef to Alligator Reef (top) and from Tennessee Reef to Coffins Patch (bottom) during June-September 2008.

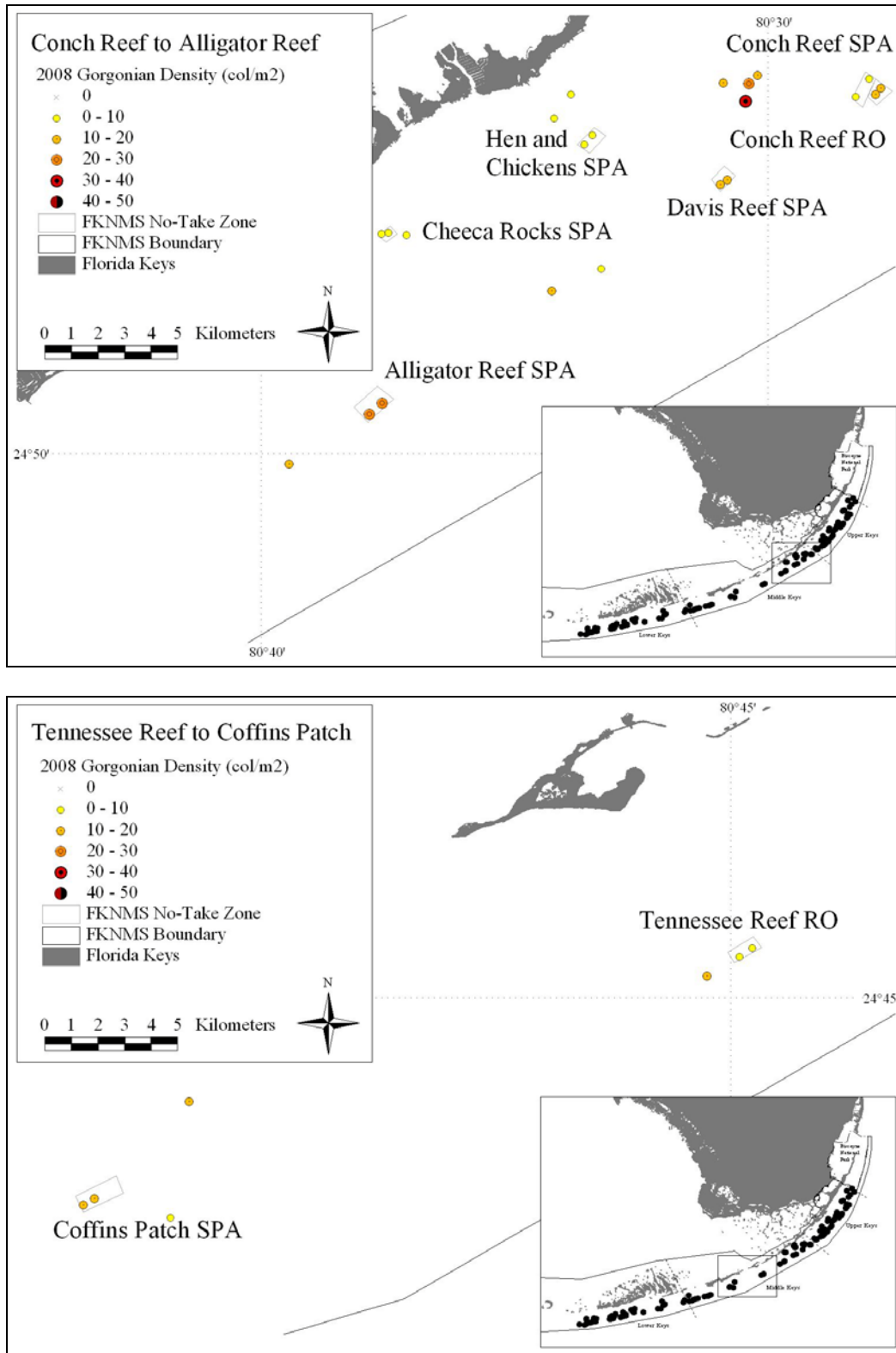


Figure 24. Total gorgonian densities (no. colonies per m²) in the middle Florida Keys from Sombrero Reef to Bahia Honda (top) and in the lower Florida Keys (bottom) during June-September 2008.

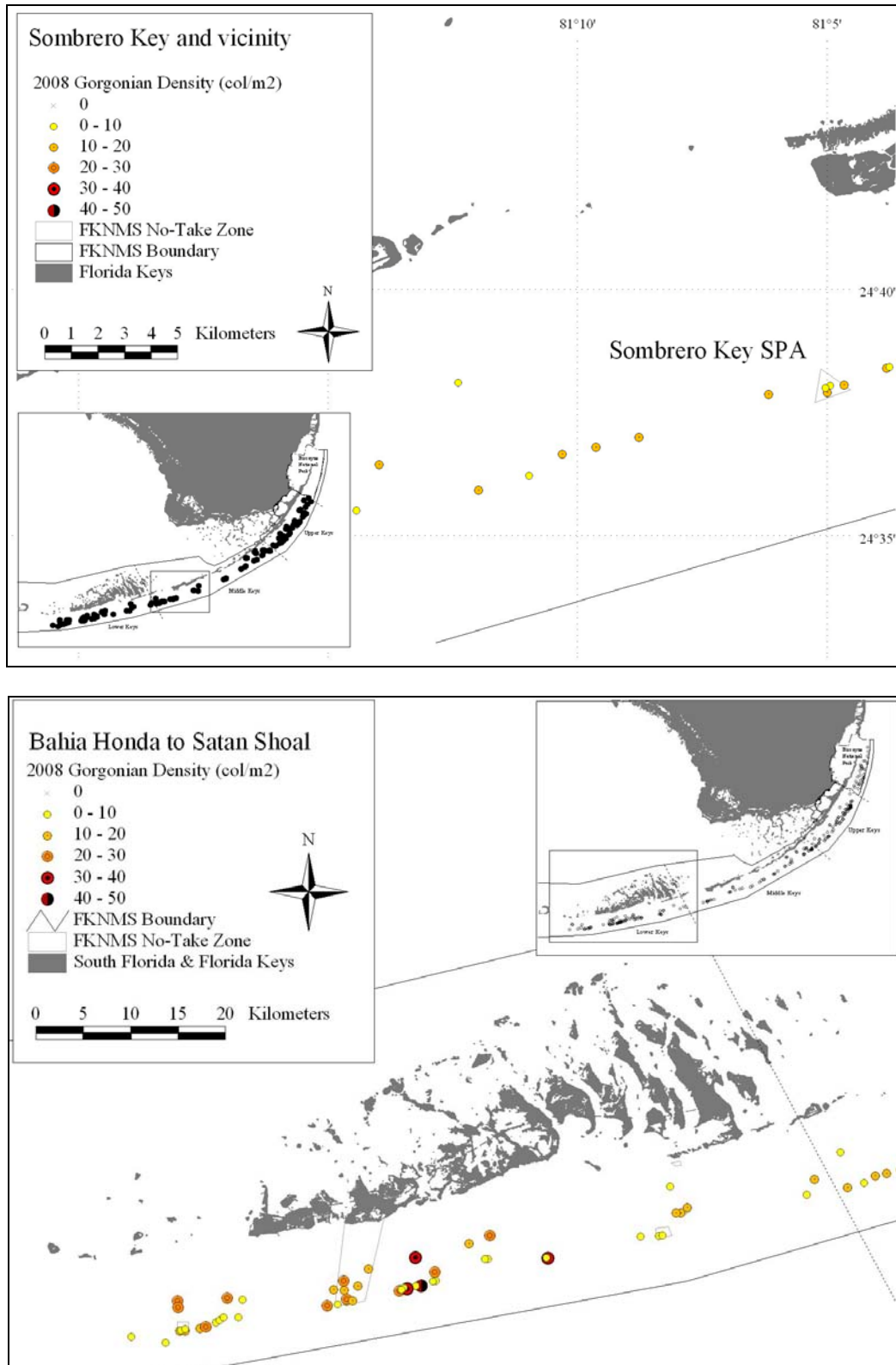


Figure 25. Total gorgonian densities (no. colonies per m²) in the lower Florida Keys from Bahia Honda to Looe Key (top) and from Shoal to Western Sambo (bottom) during June-September 2008.

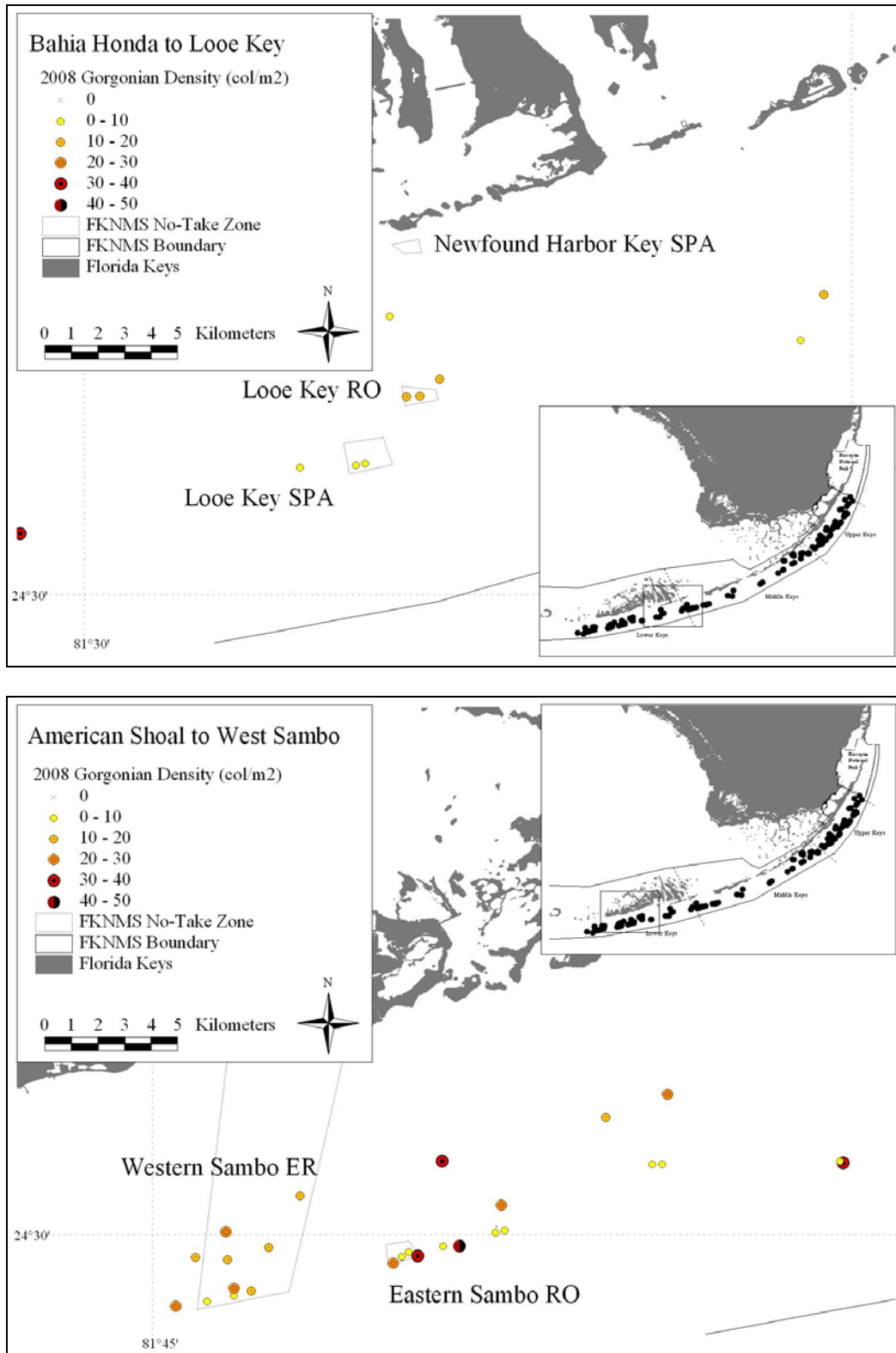


Figure 26. Total gorgonian densities (no. colonies per m²) in the lower Florida Keys from Eastern Dry Rocks to Sand Key during June-September 2008.

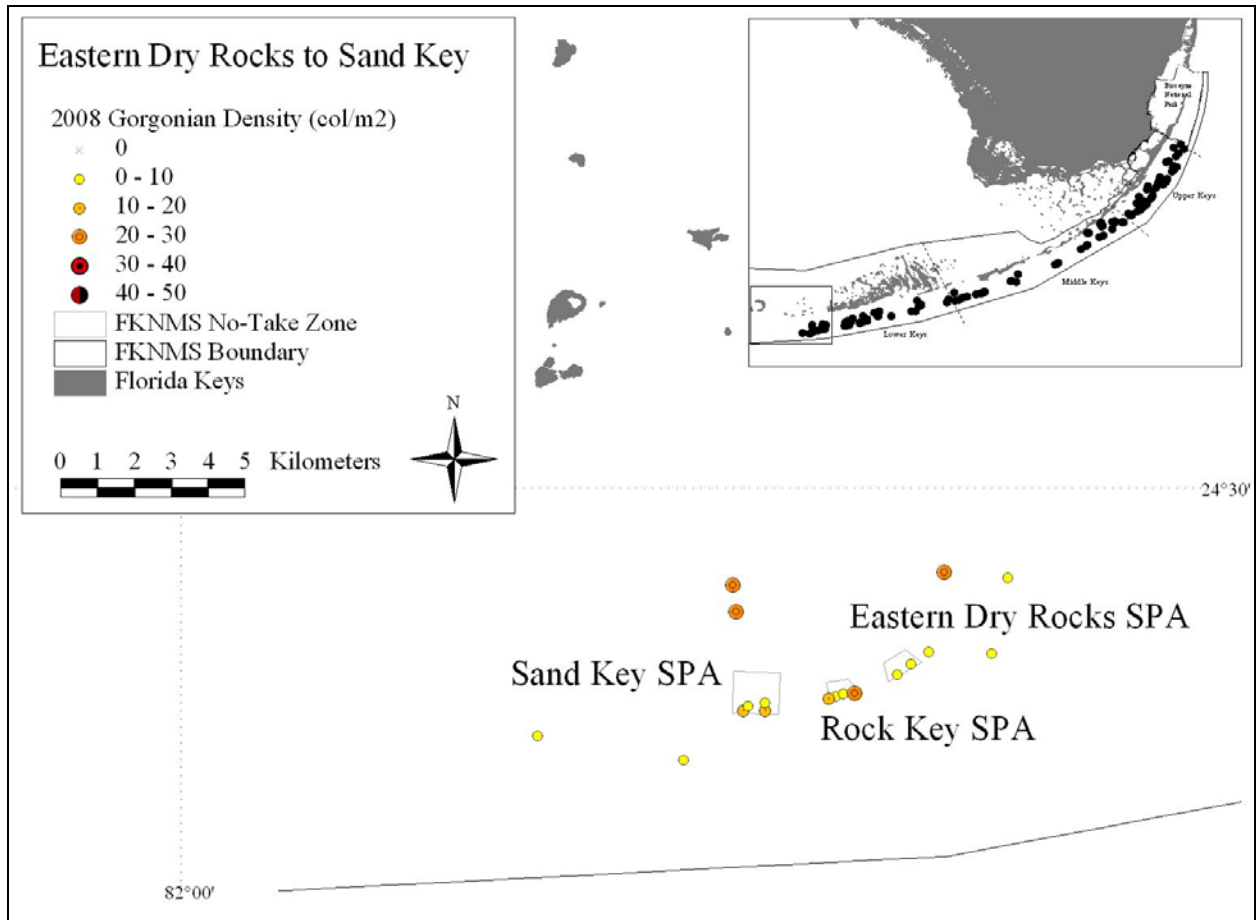


Table 6. Mean $\pm$ 1 SE densities (no. individuals per m²) and total shell lengths (SL, cm) of flamingo-tongue snails (*Cyphoma gibbosum* and *C. signatum*) and total gorgonian in the Florida Keys National Marine Sanctuary, as determined from surveys of two 8-m x 1-m belt transects per site at 145 sites during June-September 2008. Sites are arranged by habitat from northeast to southwest and asterisked locations (***) are Sanctuary Preservation Areas (SPA), Ecological Reserves (ER), or Research Only Areas (RO).

Site number/site location	<i>C. gibbosum</i>		<i>C. signatum</i>		Total gorgonians	
	No./m ²	SL (cm)	No./m ²	SL (cm)	N	No./m ²
<i>Mid-channel patch reefs</i>						
Upper Florida Keys NMS						
6 - Basin Hill Shoals	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	222	13.88 $\pm$ 3.00
5 - Basin Hill Shoals	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	224	14.00 $\pm$ 0.50
4 - Inshore of Grecian Rocks	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	282	17.63 $\pm$ 2.88
3 - South of Cannon Patch Reef	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	297	18.56 $\pm$ 7.06
2 - Mosquito Bank	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	151	9.44 $\pm$ 1.94
1 - Inshore of Molasses Reef	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	247	15.44 $\pm$ 9.56
Upper Florida Keys Total (6)	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	1,423	14.82 $\pm$ 1.33
Middle Florida Keys NMS						
56 - Tavernier Rocks	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	20	1.25 $\pm$ 0.63
55 - Tavernier Rocks	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	8	0.50 $\pm$ 0.50
59 - Hen and Chickens SPA**	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	42	2.63 $\pm$ 0.63
58 - Hen and Chickens SPA**	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	76	4.75 $\pm$ 1.75
61 - Cheeca Rocks SPA**	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	9	0.56 $\pm$ 0.44
60 - Cheeca Rocks SPA**	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	2	0.13 $\pm$ 0.00
57 - NE of Cheeca Rocks SPA	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	16	1.00 $\pm$ 0.50
54 - South of Duck Key	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	175	10.94 $\pm$ 0.06
53 - South of Ohio Key	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	158	9.88 $\pm$ 0.88
Middle Florida Keys Total (9)	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	506	3.51 $\pm$ 1.39
Lower Florida Keys NMS						
103 - North of Looe Key RO	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	60	3.75 $\pm$ 2.63
102 - North of Maryland Shoal	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	445	27.81 $\pm$ 2.81
101 - North of Maryland Shoal	0.063 $\pm$ 0.063	2.1	0 $\pm$ 0	0 $\pm$ 0	236	14.75 $\pm$ 1.63
100 - North of Eastern Sambo	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	560	35.00 $\pm$ 5.38
105 - Western Sambo ER**	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	245	15.31 $\pm$ 1.69
104 - Western Sambo ER**	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	340	21.25 $\pm$ 7.13
99 - West of Western Sambo	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	196	12.25 $\pm$ 2.25
98 - Middle Ground	0.125 $\pm$ 0.125	2.7 $\pm$ 0.3	0 $\pm$ 0	0 $\pm$ 0	458	28.63 $\pm$ 10.63
97 - Middle Ground	0.063 $\pm$ 0.063	2.4	0 $\pm$ 0	0 $\pm$ 0	426	26.63 $\pm$ 8.25
Lower Florida Keys Total (9)	0.028 $\pm$ 0.026	2.4 $\pm$ 0.2	0 $\pm$ 0	0 $\pm$ 0	2,966	20.60 $\pm$ 3.28
Mid-channel Patch Reef (24)	0.010 $\pm$ 0.006	2.4 $\pm$ 0.2	0 $\pm$ 0	0 $\pm$ 0	4,895	12.75 $\pm$ 2.09
<i>Offshore patch reefs</i>						
Upper Florida Keys NMS						
12 - South of BNP boundary	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	739	46.19 $\pm$ 9.81
41 - North of Carysfort Reef	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	157	9.81 $\pm$ 0.19
11 - North of Carysfort Reef	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	148	9.25 $\pm$ 1.88
14 - Carysfort Reef SPA**	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	575	35.94 $\pm$ 8.31
13 - Carysfort Reef SPA**	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	458	28.63 $\pm$ 10.13
10 - North of Dry Rocks SPA	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	143	8.94 $\pm$ 1.69
9 - SW of Grecian Rocks SPA	0.063 $\pm$ 0.063	3.0	0 $\pm$ 0	0 $\pm$ 0	158	9.88 $\pm$ 5.88
8 - Inshore of French Reef	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	387	24.19 $\pm$ 9.44
7 - Inshore of Pickles Reef	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	173	10.81 $\pm$ 1.19
Upper Florida Keys Total (9)	0.007 $\pm$ 0.007	3.0	0 $\pm$ 0	0 $\pm$ 0	2,938	20.40 $\pm$ 4.65
Middle Florida Keys NMS						
65 - North of Davis Reef SPA	0 $\pm$ 0	0 $\pm$ 0	0.063 $\pm$ 0.063	1.8	307	19.19 $\pm$ 2.94
64 - North of Davis Reef SPA	0.063 $\pm$ 0.063	2.7	0.063 $\pm$ 0.063	3.1	251	15.69 $\pm$ 4.81
63 - North of Davis Reef SPA	0.063 $\pm$ 0.063	2.4	0 $\pm$ 0	0 $\pm$ 0	388	24.25 $\pm$ 3.13
62 - North of Davis Reef SPA	0.188 $\pm$ 0.188	2.9 $\pm$ 0.2	0 $\pm$ 0	0 $\pm$ 0	607	37.94 $\pm$ 1.69
89 - Coffins Patch SPA**	0.188 $\pm$ 0.188	2.8 $\pm$ 0.1	0 $\pm$ 0	0 $\pm$ 0	189	11.81 $\pm$ 1.06
88 - Coffins Patch SPA**	0.125 $\pm$ 0.000	2.6 $\pm$ 0.2	0 $\pm$ 0	0 $\pm$ 0	237	14.81 $\pm$ 0.31

Site number/site location	<i>C. gibbosum</i>		<i>C. signatum</i>		Total gorgonians	
	No./m ²	SL (cm)	No./m ²	SL (cm)	N	No./m ²
Middle Florida Keys Total (6)	0.104 ± 0.031	2.7 ± 0.1	0.021 ± 0.013	2.5 ± 0.7	1,979	20.61 ± 3.88
Lower Florida Keys NMS						
109 - East of Looe Key RO	0 ± 0	0 ± 0	0 ± 0	0 ± 0	248	15.50 ± 2.13
110 - Looe Key RO**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	233	14.56 ± 2.94
111 - Looe Key RO**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	270	16.88 ± 4.63
107 - North of Pelican Shoal	0.313 ± 0.063	2.8 ± 0.2	0 ± 0	0 ± 0	351	21.94 ± 0.69
112 - Western Sambo ER**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	227	14.19 ± 3.31
113 - Western Sambo ER**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	215	13.44 ± 2.19
106 - NE of E. Dry Rocks SPA	0 ± 0	0 ± 0	0 ± 0	0 ± 0	383	23.94 ± 5.31
133 - NE of E. Dry Rocks SPA	0 ± 0	0 ± 0	0 ± 0	0 ± 0	119	7.44 ± 1.81
Lower Florida Keys Total (8)	0 ± 0	0 ± 0	0 ± 0	0 ± 0	2,046	15.98 ± 1.82
Offshore Patch Reef Total (23)	0.043 ± 0.017	2.8 ± 0.1	0.005 ± 0.004	2.5 ± 0.7	6,963	18.92 ± 2.13
<i>Inner line reef tract</i>						
Upper Florida Keys NMS						
32 - Turtle Rocks	0 ± 0	0 ± 0	0 ± 0	0 ± 0	338	21.13 ± 3.25
31 - Inshore of Elbow Reef	0 ± 0	0 ± 0	0 ± 0	0 ± 0	295	18.44 ± 3.69
30 - North Dry Rocks	0 ± 0	0 ± 0	0 ± 0	0 ± 0	228	14.25 ± 9.00
34 - Dry Rocks SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	282	17.63 ± 5.25
33 - Dry Rocks SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	488	30.50 ± 4.75
36 - Grecian Rocks SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	282	17.63 ± 2.88
35 - Grecian Rocks SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	195	12.19 ± 5.44
Upper Florida Keys Total (7)	0 ± 0	0 ± 0	0 ± 0	0 ± 0	2,108	18.82 ± 2.23
Inner Line Reef Total (7)	0 ± 0	0 ± 0	0 ± 0	0 ± 0	2,108	18.82 ± 2.23
<i>High-relief spur & groove</i>						
Upper Florida Keys NMS						
23 - Carysfort Reef SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	513	32.06 ± 9.69
22 - Carysfort Reef SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	439	27.44 ± 7.56
21 - Maitland grounding site	0 ± 0	0 ± 0	0 ± 0	0 ± 0	219	13.69 ± 6.94
24 - Elbow Reef SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	251	15.69 ± 8.44
223 - Elbow Reef SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	214	13.38 ± 6.25
19 - North of French Reef SPA	0 ± 0	0 ± 0	0 ± 0	0 ± 0	417	26.06 ± 2.31
25 - French Reef SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	38	2.38 ± 0.38
26 - French Reef SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	148	9.25 ± 8.75
20 - Sand Island	0 ± 0	0 ± 0	0 ± 0	0 ± 0	138	8.63 ± 4.50
18 - Sand Island	0.063 ± 0.063	2.2	0 ± 0	0 ± 0	224	14.00 ± 0.88
28 - Molasses Reef SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	204	12.75 ± 7.13
27 - Molasses Reef SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	327	20.44 ± 2.31
17 - Pickles Reef	0.125 ± 0.125	2.8 ± 0.1	0 ± 0	0 ± 0	221	13.81 ± 5.81
16 - Pickles Reef	0.125 ± 0.125	2.7 ± 0.1	0 ± 0	0 ± 0	44	2.75 ± 0.75
15 - Pickles Reef	0.063 ± 0.063	2.8	0 ± 0	0 ± 0	246	15.38 ± 4.63
Upper Florida Keys Total (15)	0.025 ± 0.012	2.6 ± 0.1	0 ± 0	0 ± 0	3,643	15.18 ± 2.17
Middle Florida Keys NMS						
67 - Delta Shoal	0 ± 0	0 ± 0	0 ± 0	0 ± 0	108	6.75 ± 0.25
66 - Delta Shoal	0 ± 0	0 ± 0	0 ± 0	0 ± 0	282	17.63 ± 10.25
69 - Sombrero Key SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	89	5.56 ± 1.81
266 - Sombrero Key SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	73	4.56 ± 0.31
Middle Florida Keys Total (4)	0 ± 0	0 ± 0	0 ± 0	0 ± 0	552	8.63 ± 3.03
Lower Florida Keys NMS						
124 - Looe Key SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	87	5.44 ± 0.94
123 - Looe Key SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	100	6.25 ± 0.38
120 - American Shoal	0.125 ± 0.125	3.1 ± 0.2	0 ± 0	0 ± 0	112	7.00 ± 3.38
122 - American Shoal	0 ± 0	0 ± 0	0 ± 0	0 ± 0	502	31.38 ± 6.63
119 - Maryland Shoal	0.063 ± 0.063	3.2	0 ± 0	0 ± 0	19	1.19 ± 0.06
121 - Maryland Shoal	0.250 ± 0.250	2.6 ± 0.0	0 ± 0	0 ± 0	18	1.13 ± 0.63
118 - Pelican Shoal	0 ± 0	0 ± 0	0 ± 0	0 ± 0	55	3.44 ± 2.56
117 - Pelican Shoal	0 ± 0	0 ± 0	0 ± 0	0 ± 0	108	6.75 ± 0.00
116 - No Name Reef	0.250 ± 0.125	2.3 ± 0.3	0 ± 0	0 ± 0	68	4.25 ± 2.13

Site number/site location	<i>C. gibbosum</i>		<i>C. signatum</i>		Total gorgonians	
	No./m ²	SL (cm)	No./m ²	SL (cm)	N	No./m ²
322 - Eastern Sambo RO**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	104	6.50 ± 2.00
125 - Eastern Sambo RO**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	140	8.75 ± 0.88
127 - Western Sambo ER**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	230	14.38 ± 0.63
126 - Western Sambo ER**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	137	8.56 ± 0.81
115 - East of E. Dry Rocks	0 ± 0	0 ± 0	0 ± 0	0 ± 0	67	4.19 ± 0.44
129 - Eastern Dry Rocks SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	52	3.25 ± 2.00
128 - Eastern Dry Rocks SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	80	5.00 ± 0.25
327 - Rock Key SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	137	8.56 ± 1.19
130 - Rock Key SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	143	8.94 ± 7.31
131 - Sand Key SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	113	7.06 ± 3.06
328 - Sand Key SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	64	4.00 ± 0.25
114 - Western Dry Rocks	0.188 ± 0.188	2.5 ± 0.1	0 ± 0	0 ± 0	94	5.88 ± 1.00
Lower Florida Keys Total (21)	0.042 ± 0.018	2.7 ± 0.2	0 ± 0	0 ± 0	2,430	7.23 ± 1.37
Spur & Groove Total (40)	0.031 ± 0.011	2.7 ± 0.1	0 ± 0	0 ± 0	6,625	10.35 ± 1.25
<i>Fore-reef (6-15 m)</i>						
Upper Florida Keys NMS						
42 - South of BNP boundary	0 ± 0	0 ± 0	0 ± 0	0 ± 0	237	14.81 ± 3.81
52 - Carysfort Reef SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	243	15.19 ± 4.19
51 - Carysfort Reef SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	196	12.25 ± 0.75
50 - SW of Carysfort Reef SPA	0 ± 0	0 ± 0	0 ± 0	0 ± 0	119	7.44 ± 0.69
40 - SW of Carysfort Reef SPA	0 ± 0	0 ± 0	0 ± 0	0 ± 0	213	13.31 ± 1.81
39 - North of Elbow Reef SPA	0 ± 0	0 ± 0	0 ± 0	0 ± 0	201	12.56 ± 0.81
245 - Elbow Reef SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	237	14.81 ± 2.94
46 - Elbow Reef SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	365	22.81 ± 5.19
38 - SW of Elbow Reef SPA	0 ± 0	0 ± 0	0 ± 0	0 ± 0	119	7.44 ± 0.31
49 - South of Elbow Reef SPA	0 ± 0	0 ± 0	0 ± 0	0 ± 0	161	10.06 ± 4.44
37 - Dixie Shoal	0 ± 0	0 ± 0	0 ± 0	0 ± 0	214	13.38 ± 4.13
48 - Dixie Shoal	0 ± 0	0 ± 0	0 ± 0	0 ± 0	348	21.75 ± 0.75
47 - SW of Molasses Reef SPA	0 ± 0	0 ± 0	0 ± 0	0 ± 0	324	20.25 ± 6.75
Upper Florida Keys Total (13)	0 ± 0	0 ± 0	0 ± 0	0 ± 0	2,977	14.31 ± 1.35
Middle Florida Keys NMS						
81 - Conch Reef SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	119	7.44 ± 0.81
80 - Conch Reef SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	101	6.31 ± 2.31
82 - Conch Reef RO**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	219	13.69 ± 3.06
279 - Conch Reef RO**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	218	13.63 ± 0.25
84 - Davis Reef SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	199	12.44 ± 1.06
83 - Davis Reef SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	192	12.00 ± 2.13
79 - SW of Crocker Reef	0 ± 0	0 ± 0	0 ± 0	0 ± 0	126	7.88 ± 1.38
78 - SW of Crocker Reef	0 ± 0	0 ± 0	0 ± 0	0 ± 0	215	13.44 ± 0.19
85 - Alligator Reef SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	334	20.88 ± 2.75
68 - Alligator Reef SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	355	22.19 ± 1.81
77 - SW of Alligator Reef SPA	0 ± 0	0 ± 0	0 ± 0	0 ± 0	202	12.63 ± 1.00
87 - Tennessee Reef RO**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	118	7.38 ± 1.25
86 - Tennessee Reef RO**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	159	9.94 ± 1.44
76 - NE of Tennessee Light	0 ± 0	0 ± 0	0 ± 0	0 ± 0	176	11.00 ± 1.88
75 - East of Coffins Patch SPA	0 ± 0	0 ± 0	0 ± 0	0 ± 0	99	6.19 ± 1.69
293 - Sombrero Key SPA**	0.063 ± 0.063	0.4	0 ± 0	0 ± 0	223	13.94 ± 0.56
96 - Sombrero Key SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	286	17.88 ± 1.75
73 - West of Sombrero Key	0 ± 0	0 ± 0	0 ± 0	0 ± 0	260	16.25 ± 2.13
71 - South of Moser Channel	0 ± 0	0 ± 0	0 ± 0	0 ± 0	198	12.38 ± 3.38
72 - South of Moser Channel	0 ± 0	0 ± 0	0 ± 0	0 ± 0	231	14.44 ± 2.31
70 - South of Moser Channel	0 ± 0	0 ± 0	0 ± 0	0 ± 0	222	13.88 ± 3.63
90 - South of Moser Channel	0 ± 0	0 ± 0	0 ± 0	0 ± 0	110	6.88 ± 1.38
Middle Florida Keys Total (22)	0.003 ± 0.003	0.4	0 ± 0	0 ± 0	4,362	12.39 ± 0.94
Lower Florida Keys NMS						
136 - South of Bahia Honda Key	0 ± 0	0 ± 0	0 ± 0	0 ± 0	160	10.00 ± 2.25
138 - South of Bahia Honda Key	0 ± 0	0 ± 0	0 ± 0	0 ± 0	224	14.00 ± 2.13
137 - South of Bahia Honda Key	0 ± 0	0 ± 0	0 ± 0	0 ± 0	246	15.38 ± 1.00

Site number/site location	<i>C. gibbosum</i>		<i>C. signatum</i>		Total gorgonians	
	No./m ²	SL (cm)	No./m ²	SL (cm)	N	No./m ²
135 - West of Looe Key SPA	0 ± 0	0 ± 0	0 ± 0	0 ± 0	140	8.75 ± 0.88
134 - West of Pelican Shoal	0 ± 0	0 ± 0	0 ± 0	0 ± 0	673	42.06 ± 7.06
139 - Eastern Sambo RO**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	544	34.00 ± 1.25
336 - Eastern Sambo RO**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	364	22.75 ± 3.88
141 - Western Sambo ER**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	327	20.44 ± 5.19
140 - Western Sambo ER**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	147	9.19 ± 9.19
143 - West of Western Sambo	0 ± 0	0 ± 0	0 ± 0	0 ± 0	454	28.38 ± 6.63
132 - East of E. Dry Rocks SPA	0 ± 0	0 ± 0	0 ± 0	0 ± 0	159	9.94 ± 0.06
346 - Rock Key SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	457	28.56 ± 5.94
149 - Rock Key SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	266	16.63 ± 5.13
347 - Sand Key SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	292	18.25 ± 5.00
150 - Sand Key SPA**	0 ± 0	0 ± 0	0 ± 0	0 ± 0	299	18.69 ± 0.06
142 - SW of Sand Key SPA	0 ± 0	0 ± 0	0 ± 0	0 ± 0	119	7.44 ± 1.06
Lower Florida Keys Total (16)	0 ± 0	0 ± 0	0 ± 0	0 ± 0	4,871	19.03 ± 2.50
Fore-reef Total (51)	0.001 ± 0.001	0.4	0 ± 0	0 ± 0	12,210	14.96 ± 1.01

Table 7. Size frequency distributions (top) and gorgonian host occupation patterns (bottom) of flamingo-tongue snails in the Florida Keys National Marine Sanctuary, as determined from surveys of four 15-m x 1-m belt transects per site at 145 sites during June-September 2008.

Shell Length Frequency

Total Shell Length (cm)	<i>Cyphoma gibbosum</i>		<i>C. signatum</i>	
	Frequency	% Total	Frequency	% Total
< 1.0	1	2.4	0	0
1-1.9	1	2.4	1	50.0
2-2.9	31	75.6	0	0
3-3.9	8	19.5	1	50.0
4-4.9	0	0	0	0
5-5.9	0	0	0	0
6-6.9	0	0	0	0
Total	41	100.0	2	100.0

Substratum Occupancy

Gorgonian host genera	<i>Cyphoma gibbosum</i>		<i>C. signatum</i>	
	Frequency	% Total	Frequency	% Total
<i>Eunicea</i>	9	22.0	0	0
<i>Gorgonia</i>	7	17.1	0	0
<i>Muricea</i>	1	2.4	0	0
<i>Muriceopsis</i>	1	2.4	0	0
<i>Plexaura</i>	12	29.3	0	0
<i>Plexaurella</i>	3	7.3	1	50.0
<i>Pseudopterogorgia</i>	8	19.5	1	50.0
Total	41	100.0	2	100.0

Table 8. Numbers of colonies (N), mean $\pm$ 1 SE colony densities (no. per m²), and mean $\pm$ 1 SE colony heights for *Briareum asbestinum* and *Eunicea* gorgonians in the Florida Keys National Marine Sanctuary, as determined from surveys of two 8-m x 1-m transects per site at 145 locations during June-September 2008. Sites are arranged by habitat from northeast to southwest and asterisked locations (**) are Sanctuary Preservation Areas (SPA), Ecological Reserves (ER), or Research Only Areas (RO).

Site number/site location	<i>Briareum asbestinum</i>			<i>Eunicea</i> spp.		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
<i>Mid-channel patch reefs</i>						
Upper Florida Keys NMS						
6 - Basin Hill Shoals	2	0.13 $\pm$ 0.13	8.5 $\pm$ 2.5	12	0.75 $\pm$ 0.13	22.1 $\pm$ 6.0
5 - Basin Hill Shoals	2	0.13 $\pm$ 0.13	8.0 $\pm$ 1.0	4	0.25 $\pm$ 0.13	22.5 $\pm$ 4.6
4 - Inshore of Grecian Rocks SPA	2	0.13 $\pm$ 0.13	11.00 $\pm$ 1.0	8	0.50 $\pm$ 0.38	8.5 $\pm$ 1.5
3 - South of Cannon Patch Reef	6	0.38 $\pm$ 0.13	13.3 $\pm$ 3.1	35	2.19 $\pm$ 0.31	18.3 $\pm$ 2.7
2 - Mosquito Bank	0	0 $\pm$ 0	0 $\pm$ 0	2	0.13 $\pm$ 0.13	49.0 $\pm$ 3.0
1 - Inshore of Molasses Reef	4	0.25 $\pm$ 0.00	13.5 $\pm$ 3.2	11	0.69 $\pm$ 0.44	15.5 $\pm$ 3.6
Upper Florida Keys Total (6)	16	0.17 $\pm$ 0.05	10.9 $\pm$ 1.2	72	0.75 $\pm$ 0.30	22.7 $\pm$ 5.7
Middle Florida Keys NMS						
56 - Tavernier Rocks	0	0 $\pm$ 0	0 $\pm$ 0	6	0.38 $\pm$ 0.13	14.8 $\pm$ 2.7
55 - Tavernier Rocks	1	0.06 $\pm$ 0.06	30.0	4	0.25 $\pm$ 0.25	35.3 $\pm$ 12.0
59 - Hen and Chickens SPA**	4	0.25 $\pm$ 0	21.5 $\pm$ 10.4	1	0.06 $\pm$ 0.06	20.0
58 - Hen and Chickens SPA**	12	0.75 $\pm$ 0.25	14.6 $\pm$ 3.0	3	0.19 $\pm$ 0.06	24.0 $\pm$ 4.0
61 - Cheeca Rocks SPA**	0	0 $\pm$ 0	0 $\pm$ 0	0	0 $\pm$ 0	0 $\pm$ 0
60 - Cheeca Rocks SPA**	0	0 $\pm$ 0	0 $\pm$ 0	0	0 $\pm$ 0	0 $\pm$ 0
57 - NE of Cheeca Rocks SPA	0	0 $\pm$ 0	0 $\pm$ 0	0	0 $\pm$ 0	0 $\pm$ 0
54 - South of Duck Key	2	0.13 $\pm$ 0.13	13.0 $\pm$ 5.0	16	1.00 $\pm$ 0.13	20.9 $\pm$ 2.9
53 - South of Ohio Key	7	0.44 $\pm$ 0.31	13.4 $\pm$ 4.3	8	0.50 $\pm$ 0.25	20.3 $\pm$ 5.1
Middle Florida Keys Total (9)	26	0.18 $\pm$ 0.09	18.5 $\pm$ 3.3	38	0.26 $\pm$ 0.11	22.5 $\pm$ 2.8
Lower Florida Keys NMS						
103 - North of Looe Key RO	0	0 $\pm$ 0	0 $\pm$ 0	0.5	0.13 $\pm$ 0.13	2.5 $\pm$ 1.5
102 - North of Maryland Shoal	5	0.31 $\pm$ 0.06	13.8 $\pm$ 4.2	1.6	2.63 $\pm$ 1.13	16.9 $\pm$ 1.6
101 - North of Maryland Shoal	0	0 $\pm$ 0	0 $\pm$ 0	0.7	1.13 $\pm$ 0.00	8.1 $\pm$ 0.7
100 - North of Eastern Sambo RO	0	0 $\pm$ 0	0 $\pm$ 0	1.5	3.31 $\pm$ 1.06	13.3 $\pm$ 1.5
105 - Western Sambo ER**	0	0 $\pm$ 0	0 $\pm$ 0	8.8	0.38 $\pm$ 0.00	21.5 $\pm$ 8.8
104 - Western Sambo ER**	4	0.25 $\pm$ 0.13	19.3 $\pm$ 5.1	2.6	1.81 $\pm$ 0.81	22.3 $\pm$ 2.6
99 - West of Western Sambo ER	2	0.13 $\pm$ 0.13	13.0 $\pm$ 4.0	1.5	2.56 $\pm$ 1.69	16.5 $\pm$ 1.5
98 - Middle Ground	1	0.06 $\pm$ 0.06	25.0	1.6	3.81 $\pm$ 2.06	19.3 $\pm$ 1.6
97 - Middle Ground	0	0 $\pm$ 0	0 $\pm$ 0	2.0	2.31 $\pm$ 1.06	14.1 $\pm$ 2.0
Lower Florida Keys Total (9)	12	0.08 $\pm$ 0.04	17.8 $\pm$ 2.8	289	2.01 $\pm$ 0.42	14.9 $\pm$ 2.1
Mid-channel Patch Reef Total (24)	54	0.14 $\pm$ 0.04	15.6 $\pm$ 1.7	399	1.04 $\pm$ 0.24	19.3 $\pm$ 2.1
<i>Offshore patch reefs</i>						
Upper Florida Keys NMS						
12 - South of BNP boundary	0	0 $\pm$ 0	0 $\pm$ 0	28	1.75 $\pm$ 0.38	12.6 $\pm$ 2.0
41 - North of Carysfort Reef SPA	10	0.63 $\pm$ 0.63	10.6 $\pm$ 2.7	23	1.44 $\pm$ 0.31	19.8 $\pm$ 5.1
11 - North of Carysfort Reef SPA	1	0.06 $\pm$ 0.06	18.0	41	2.56 $\pm$ 1.06	16.4 $\pm$ 1.9
14 - Carysfort Reef SPA**	2	0.13 $\pm$ 0.13	6.5 $\pm$ 3.5	37	2.31 $\pm$ 1.81	16.7 $\pm$ 1.7
13 - Carysfort Reef SPA**	4	0.25 $\pm$ 0.25	6.0 $\pm$ 2.0	19	1.19 $\pm$ 0.19	16.9 $\pm$ 2.6
10 - North of Dry Rocks SPA	0	0 $\pm$ 0	0 $\pm$ 0	8	0.50 $\pm$ 0.00	20.3 $\pm$ 4.2
9 - SW of Grecian Rocks SPA	0	0 $\pm$ 0	0 $\pm$ 0	27	1.69 $\pm$ 1.69	14.2 $\pm$ 1.5
8 - Inshore of French Reef SPA	1	0.06 $\pm$ 0.06	12.0	32	2.00 $\pm$ 1.13	14.5 $\pm$ 1.7
7 - Inshore of Pickles Reef	0	0 $\pm$ 0	0 $\pm$ 0	16	1.00 $\pm$ 0.25	15.6 $\pm$ 3.3
Upper Florida Keys Total (9)	18	0.13 $\pm$ 0.07	10.6 $\pm$ 2.2	231	1.60 $\pm$ 0.22	16.3 $\pm$ 0.8
Middle Florida Keys NMS						
65 - North of Davis Reef SPA	0	0 $\pm$ 0	0 $\pm$ 0	2.0	3.06 $\pm$ 1.06	12.2 $\pm$ 2.0
64 - North of Davis Reef SPA	0	0 $\pm$ 0	0 $\pm$ 0	2.1	1.81 $\pm$ 0.56	10.2 $\pm$ 2.1
63 - North of Davis Reef SPA	0	0 $\pm$ 0	0 $\pm$ 0	1.2	6.44 $\pm$ 1.69	13.9 $\pm$ 1.2
62 - North of Davis Reef SPA	0	0 $\pm$ 0	0 $\pm$ 0	1.2	6.88 $\pm$ 0.50	14.7 $\pm$ 1.2
89 - Coffins Patch SPA**	0	0 $\pm$ 0	0 $\pm$ 0	1.6	1.88 $\pm$ 0.63	14.4 $\pm$ 1.6

Site number/site location	<i>Briareum asbestinum</i>			<i>Eunicea spp.</i>		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
88 - Coffins Patch SPA**	0	0 ± 0	0 ± 0	12	0.75 ± 0.13	22.3 ± 4.6
Middle Florida Keys Total (6)	0	0 ± 0	0 ± 0	333	3.47 ± 1.05	14.6 ± 1.7
Lower Florida Keys NMS						
109 - East of Looe Key RO	0	0 ± 0	0 ± 0	2.3	1.94 ± 0.44	15.8 ± 2.3
110 - Looe Key Research Only**	0	0 ± 0	0 ± 0	1.5	1.69 ± 1.31	12.0 ± 1.5
111 - Looe Key Research Only**	3	0.19 ± 0.19	9.0 ± 0.6	2.2	2.31 ± 0.69	15.7 ± 2.2
107 - North of Pelican Shoal	0	0 ± 0	0 ± 0	1.0	4.06 ± 0.31	9.8 ± 1.0
112 - Western Sambo ER**	6	0.38 ± 0.00	11.3 ± 2.9	1.4	3.00 ± 1.63	19.5 ± 1.4
113 - Western Sambo ER**	2	0.13 ± 0.00	20.5 ± 2.5	2.7	0.56 ± 0.56	13.4 ± 2.7
106 - NE of E. Dry Rocks SPA	5	0.31 ± 0.19	8.0 ± 1.5	1.0	7.06 ± 1.81	13.7 ± 1.0
133 - NE of E. Dry Rocks SPA	2	0.13 ± 0.00	19.0 ± 4.0	5.7	0.75 ± 0.38	29.0 ± 5.7
Lower Florida Keys Total (8)	18	0.14 ± 0.05	13.6 ± 2.6	342	2.67 ± 0.75	16.1 ± 2.1
Offshore Patch Reef Total (23)	36	0.10 ± 0.03	12.1 ± 1.7	906	2.46 ± 0.40	15.8 ± 0.9
<i>Inner line reef tract spur & groove</i>						
Upper Florida Keys NMS						
32 - Turtle Rocks	1	0.06 ± 0.06	1.0	1.4	3.38 ± 0.75	13.1 ± 1.4
31 - Inshore of Elbow Reef SPA	1	0.06 ± 0.06	21.0	1.6	2.19 ± 0.19	13.0 ± 1.6
30 - North Dry Rocks	0	0 ± 0	0 ± 0	5.6	0.75 ± 0.50	23.4 ± 5.6
34 - Dry Rocks SPA**	0	0 ± 0	0 ± 0	2.6	0.69 ± 0.56	14.2 ± 2.6
33 - Dry Rocks SPA**	0	0 ± 0	0 ± 0	2.5	0.88 ± 0.25	15.1 ± 2.5
36 - Grecian Rocks SPA**	1	0.06 ± 0.06	11.0	10.6	0.50 ± 0.25	15.9 ± 10.6
35 - Grecian Rocks SPA**	0	0 ± 0	0 ± 0	4.0	0.44 ± 0.19	16.9 ± 4.0
Upper Florida Keys Total (7)	3	0.03 ± 0.01	11.0 ± 5.8	141	1.26 ± 0.42	15.9 ± 1.4
Inner Line Spur & Groove Total (7)	3	0.03 ± 0.01	11.0 ± 5.8	141	1.26 ± 0.42	15.9 ± 1.4
<i>High-relief spur & groove</i>						
Upper Florida Keys NMS						
23 - Carysfort Reef SPA**	0	0 ± 0	0 ± 0	13	0.81 ± 0.06	12.5 ± 2.6
22 - Carysfort Reef SPA**	2	0.13 ± 0.13	12.0 ± 6.0	11	0.69 ± 0.06	18.9 ± 3.8
21 - Maitland grounding site	0	0 ± 0	0 ± 0	14	0.88 ± 0.25	14.9 ± 4.0
24 - Elbow Reef SPA**	0	0 ± 0	0 ± 0	5	0.31 ± 0.06	6.0 ± 1.8
223 - Elbow Reef SPA**	0	0 ± 0	0 ± 0	5	0.31 ± 0.06	8.2 ± 3.0
19 - North of French Reef SPA	0	0 ± 0	0 ± 0	27	1.69 ± 0.44	9.5 ± 1.1
25 - French Reef SPA**	0	0 ± 0	0 ± 0	1	0.06 ± 0.06	8.0
26 - French Reef SPA**	3	0.19 ± 0.19	9.3 ± 3.3	0	0 ± 0	0 ± 0
20 - Sand Island	0	0 ± 0	0 ± 0	7	0.44 ± 0.19	12.4 ± 3.3
18 - Sand Island	0	0 ± 0	0 ± 0	5	0.31 ± 0.06	10.0 ± 1.8
28 - Molasses Reef SPA**	0	0 ± 0	0 ± 0	5	0.31 ± 0.31	14.2 ± 3.4
27 - Molasses Reef SPA**	0	0 ± 0	0 ± 0	3	0.19 ± 0.06	6.7 ± 1.2
17 - Pickles Reef	0	0 ± 0	0 ± 0	13	0.81 ± 0.44	8.8 ± 2.9
16 - Pickles Reef	0	0 ± 0	0 ± 0	5	0.31 ± 0.06	14.4 ± 3.0
15 - Pickles Reef	0	0 ± 0	0 ± 0	13	0.81 ± 0.19	14.1 ± 3.8
Upper Florida Keys Total (15)	5	0.02 ± 0.01	10.7 ± 1.3	127	0.53 ± 0.11	11.3 ± 1.0
Middle Florida Keys NMS						
67 - Delta Shoal	0	0 ± 0	0 ± 0	4	0.25 ± 0.00	10.5 ± 6.7
66 - Delta Shoal	0	0 ± 0	0 ± 0	47	2.94 ± 2.69	17.3 ± 1.5
69 - Sombrero Key SPA**	0	0 ± 0	0 ± 0	1	0.06 ± 0.06	13.0
266 - Sombrero Key SPA**	0	0 ± 0	0 ± 0	2	0.13 ± 0.13	19.0 ± 11.0
Middle Florida Keys Total (4)	0	0 ± 0	0 ± 0	54	0.84 ± 0.70	14.9 ± 1.9
Lower Florida Keys NMS						
124 - Looe Key SPA**	4	0.25 ± 0.00	25.8 ± 8.3	4	0.25 ± 0.25	14.5 ± 5.9
123 - Looe Key SPA**	0	0 ± 0	0 ± 0	2	0.13 ± 0.00	4.5 ± 0
120 - American Shoal	0	0 ± 0	0 ± 0	6	0.38 ± 0.25	9.2 ± 2.0
122 - American Shoal	0	0 ± 0	0 ± 0	110	6.88 ± 2.00	12.4 ± 1.0
119 - Maryland Shoal	0	0 ± 0	0 ± 0	1	0.06 ± 0.06	18.0
121 - Maryland Shoal	0	0 ± 0	0 ± 0	3	0.19 ± 0.06	11.0 ± 3.8
118 - Pelican Shoal	0	0 ± 0	0 ± 0	4	0.25 ± 0.13	12.5 ± 4.9
117 - Pelican Shoal	0	0 ± 0	0 ± 0	1	0.06 ± 0.06	6.0

Site number/site location	<i>Briareum asbestinum</i>			<i>Eunicea spp.</i>		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
116 - No Name Reef	0	0 ± 0	0 ± 0	1	0.06 ± 0.06	14.0
322 - Eastern Sambo RO**	0	0 ± 0	0 ± 0	3	0.19 ± 0.19	7.0 ± 0.6
125 - Eastern Sambo RO**	0	0 ± 0	0 ± 0	10	0.63 ± 0.13	9.7 ± 2.5
127 - Western Sambo ER**	0	0 ± 0	0 ± 0	16	1.00 ± 0.25	8.9 ± 1.5
126 - Western Sambo ER**	4	0.25 ± 0.25	9.5 ± 2.3	8	0.50 ± 0.38	13.0 ± 3.9
115 - East of E. Dry Rocks SPA	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
129 - Eastern Dry Rocks SPA**	0	0 ± 0	0 ± 0	3	0.19 ± 0.19	16.3 ± 3.4
128 - Eastern Dry Rocks**	0	0 ± 0	0 ± 0	9	0.56 ± 0.44	10.2 ± 2.2
327 - Rock Key SPA**	0	0 ± 0	0 ± 0	7	0.44 ± 0.44	11.9 ± 3.2
130 - Rock Key SPA**	0	0 ± 0	0 ± 0	15	0.94 ± 0.81	8.9 ± 1.1
131 - Sand Key SPA**	0	0 ± 0	0 ± 0	7	0.44 ± 0.19	7.9 ± 2.1
328 - Sand Key SPA**	0	0 ± 0	0 ± 0	2	0.13 ± 0.00	5.5 ± 0.5
114 - Western Dry Rocks	0	0 ± 0	0 ± 0	2	0.13 ± 0.13	16.0 ± 9.0
Lower Florida Keys Total (21)	8	0.02 ± 0.02	17.6 ± 8.1	214	0.64 ± 0.32	10.9 ± 0.8
High-relief Spur & Groove Total (40)	11	0.02 ± 0.01	14.1 ± 3.9	395	0.62 ± 0.18	11.5 ± 0.6
<i>Fore-reef (6-15 m)</i>						
Upper Florida Keys NMS						
42 - South of BNP boundary	0	0 ± 0	0 ± 0	56	3.50 ± 0.75	10.5 ± 0.8
52 - Carysfort Reef SPA**	4	0.25 ± 0.25	9.3 ± 3.6	30	1.88 ± 0.50	10.6 ± 0.8
51 - Carysfort Reef SPA**	10	0.63 ± 0.63	7.3 ± 2.3	1	0.06 ± 0.06	2.0
50 - SW of Carysfort Reef SPA	5	0.31 ± 0.31	13.6 ± 4.0	6	0.38 ± 0.13	19.2 ± 6.8
40 - SW of Carysfort Reef SPA	0	0 ± 0	13.3 ± 7.3	55	3.44 ± 0.69	21.1 ± 2.7
39 - North of Elbow Reef SPA	8	0.50 ± 0.50	8.6 ± 2.6	6	0.38 ± 0.00	11.5 ± 4.2
245 - Elbow Reef SPA**	0	0 ± 0	0 ± 0	5	0.31 ± 0.06	9.4 ± 1.9
46 - Elbow Reef SPA**	0	0 ± 0	0 ± 0	28	1.75 ± 0.00	8.0 ± 1.3
38 - SW of Elbow Reef SPA	0	0 ± 0	0 ± 0	16	1.00 ± 0.13	12.9 ± 3.2
49 - South of Elbow Reef SPA	0	0 ± 0	0 ± 0	12	0.75 ± 0.00	28.8 ± 5.5
37 - Dixie Shoal	2	0.13 ± 0.00	3.5 ± 1.5	14	0.88 ± 0.38	7.4 ± 1.1
48 - Dixie Shoal	16	1.00 ± 0.38	9.4 ± 1.4	31	1.94 ± 0.19	8.6 ± 0.9
47 - SW of Molasses Reef SPA	4	0.25 ± 0.25	13.8 ± 3.4	35	2.19 ± 1.19	6.0 ± 1.9
Upper Florida Keys Total (13)	49	0.24 ± 0.09	9.8 ± 1.3	295	1.42 ± 0.32	12.0 ± 2.0
Middle Florida Keys NMS						
81 - Conch Reef SPA**	1	0.06 ± 0.06	8.0	22	1.38 ± 0.25	9.2 ± 0.9
80 - Conch Reef SPA**	0	0 ± 0	0 ± 0	17	1.06 ± 0.56	11.1 ± 1.5
82 - Conch Reef RO**	11	0.69 ± 0.19	12.6 ± 3.7	7	0.44 ± 0.19	18.4 ± 8.9
279 - Conch Reef RO**	3	0.19 ± 0.06	12.0 ± 7.0	28	1.75 ± 0.88	11.2 ± 2.3
84 - Davis Reef SPA**	0	0 ± 0	0 ± 0	33	2.06 ± 1.44	7.0 ± 0.6
83 - Davis Reef SPA**	0	0 ± 0	0 ± 0	12	0.75 ± 0.25	8.0 ± 1.6
79 - SW of Crocker Reef	4	0.25 ± 0.13	5.8 ± 1.7	1	0.05 ± 0.06	2.0
78 - SW of Crocker Reef	0	0 ± 0	0 ± 0	14	0.88 ± 0.38	13.2 ± 4.6
85 - Alligator Reef SPA**	0	0 ± 0	0 ± 0	66	4.13 ± 0.50	13.7 ± 1.3
68 - Alligator Reef SPA**	0	0 ± 0	0 ± 0	66	4.13 ± 0.63	12.2 ± 1.1
77 - SW of Alligator Reef SPA	6	0.38 ± 0.13	7.5 ± 1.6	15	0.94 ± 0.44	9.6 ± 1.4
87 - Tennessee Reef RO**	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
86 - Tennessee Reef RO**	0	0 ± 0	0 ± 0	6	0.38 ± 0.38	17.0 ± 7.0
76 - NE of Tennessee Light	0	0 ± 0	0 ± 0	12	0.75 ± 0.25	18.0 ± 3.6
75 - East of Coffins Patch SPA	0	0 ± 0	0 ± 0	1	0.06 ± 0.06	12.0
293 - Sombrero Key SPA**	0	0 ± 0	0 ± 0	15	0.94 ± 0.19	10.9 ± 1.3
96 - Sombrero Key SPA**	0	0 ± 0	0 ± 0	25	1.56 ± 0.19	11.2 ± 1.2
73 - West of Sombrero Key SPA	0	0 ± 0	0 ± 0	16	1.00 ± 0.13	18.0 ± 2.7
71 - South of Moser Channel	0	0 ± 0	0 ± 0	13	0.81 ± 0.31	12.8 ± 3.2
72 - South of Moser Channel	0	0 ± 0	0 ± 0	13	0.81 ± 0.06	8.8 ± 1.5
70 - South of Moser Channel	0	0 ± 0	0 ± 0	11	0.69 ± 0.19	16.1 ± 3.4
90 - South of Moser Channel	0	0 ± 0	0 ± 0	8	0.50 ± 0.25	12.4 ± 6.0
Middle Florida Keys Total (22)	25	0.07 ± 0.04	9.2 ± 1.3	401	1.14 ± 0.23	12.0 ± 0.9
Lower Florida Keys NMS						
136 - South of Bahia Honda Key	0	0 ± 0	0 ± 0	9	0.56 ± 0.19	26.0 ± 6.1

Site number/site location	<i>Briareum asbestinum</i>			<i>Eunicea</i> spp.		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
138 - Looe Key SPA**	0	0 ± 0	0 ± 0	9	0.56 ± 0.19	26.0 ± 6.1
137 - Looe Key SPA**	0	0 ± 0	0 ± 0	30	1.88 ± 0.38	12.8 ± 1.9
135 - American Shoal	0	0 ± 0	0 ± 0	19	1.19 ± 0.31	11.4 ± 2.6
134 - American Shoal	3	0.19 ± 0.19	7.0 ± 1.0	22	1.38 ± 0.50	19.8 ± 4.1
139 - American Shoal	7	0.44 ± 0.19	8.4 ± 2.0	96	6.00 ± 1.13	9.7 ± 0.7
336 - American Shoal	10	0.63 ± 0.13	12.2 ± 2.2	83	5.19 ± 0.69	11.4 ± 1.4
141 - American Shoal	0	0 ± 0	0 ± 0	50	3.13 ± 0.25	11.6 ± 1.3
140 - East of Eastern Sambo RO	2	0.13 ± 0.13	7.5 ± 3.5	30	1.88 ± 0.63	8.4 ± 1.4
143 - Eastern Sambo RO**	1	0.06 ± 0.06	2.0	20	1.25 ± 1.25	14.8 ± 2.7
132 - Eastern Sambo RO**	0	0 ± 0	0 ± 0	52	3.25 ± 1.00	9.7 ± 0.8
346 - Middle Sambo Reef	0	0 ± 0	0 ± 0	17	1.06 ± 0.06	17.9 ± 4.5
149 - Middle Sambo Reef	2	0.13 ± 0.13	4.0 ± 1.0	58	3.63 ± 0.25	13.7 ± 1.7
347 - Western Sambo ER**	2	0.13 ± 0.13	14.0 ± 8.0	27	1.69 ± 0.81	11.9 ± 1.7
150 - Western Sambo ER**	4	0.25 ± 0.25	15.3 ± 4.1	18	1.13 ± 0.63	16.6 ± 2.6
142 - Western Sambo ER**	0	0 ± 0	0 ± 0	71	4.44 ± 0.31	13.8 ± 1.9
Lower Florida Keys Total (16)	31	0.12 ± 0.05	8.8 ± 1.7	612	2.39 ± 0.42	13.7 ± 1.1
Fore-reef Total (51)	105	0.13 ± 0.03	9.3 ± 0.5	1,308	1.60 ± 0.20	12.6 ± 0.7

Table 9. Numbers of colonies (N), mean $\pm$ 1 SE colony densities (no. per m²), and mean $\pm$ 1 SE colony heights for *Gorgonia ventalina* and *Muricea* gorgonians in the Florida Keys National Marine Sanctuary, as determined from surveys of two 8-m x 1-m transects per site at 145 locations during June-September 2008. Sites are arranged by habitat from northeast to southwest and asterisked locations (**) are Sanctuary Preservation Areas (SPA), Ecological Reserves (ER), or Research Only Areas (RO).

Site number/site location	<i>Gorgonia ventalina</i>			<i>Muricea</i> spp.		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
<i>Mid-channel patch reefs</i>						
Upper Florida Keys NMS						
6 - Basin Hill Shoals	6	0.38 $\pm$ 0.00	14.8 $\pm$ 3.1	4	0.25 $\pm$ 0.13	5.0 $\pm$ 0.9
5 - Basin Hill Shoals	6	0.38 $\pm$ 0.13	32.8 $\pm$ 5.3	0	0 $\pm$ 0	0 $\pm$ 0
4 - Inshore of Grecian Rocks SPA	38	2.38 $\pm$ 0.63	22.8 $\pm$ 2.7	7	0.44 $\pm$ 0.06	12.0 $\pm$ 4.8
3 - South of Cannon Patch Reef	27	1.69 $\pm$ 1.69	14.1 $\pm$ 2.0	4	0.25 $\pm$ 0.25	10.8 $\pm$ 1.4
2 - Mosquito Bank	35	2.19 $\pm$ 0.69	28.7 $\pm$ 2.9	1	0.06 $\pm$ 0.06	23.0
1 - Inshore of Molasses Reef	19	1.29 $\pm$ 0.19	16.8 $\pm$ 1.9	9	0.56 $\pm$ 0.19	10.6 $\pm$ 1.6
Upper Florida Keys Total (6)	131	1.36 $\pm$ 0.36	21.7 $\pm$ 3.2	25	0.26 $\pm$ 0.09	12.3 $\pm$ 2.9
Middle Florida Keys NMS						
56 - Tavernier Rocks	0	0 $\pm$ 0	0 $\pm$ 0	4	0.25 $\pm$ 0.13	29.0 $\pm$ 12.0
55 - Tavernier Rocks	0	0 $\pm$ 0	0 $\pm$ 0	0	0 $\pm$ 0	0 $\pm$ 0
59 - Hen and Chickens SPA**	3	0.19 $\pm$ 0.06	37.3 $\pm$ 11.8	0	0 $\pm$ 0	0 $\pm$ 0
58 - Hen and Chickens SPA**	5	0.31 $\pm$ 0.19	40.0 $\pm$ 10.7	1	0.06 $\pm$ 0.06	27.0
61 - Cheeca Rocks SPA**	3	0.19 $\pm$ 0.19	34.7 $\pm$ 3.8	1	0.06 $\pm$ 0.06	10.0
60 - Cheeca Rocks SPA**	0	0 $\pm$ 0	0 $\pm$ 0	0	0 $\pm$ 0	0 $\pm$ 0
57 - NE of Cheeca Rocks SPA	5	0.31 $\pm$ 0.06	37.6 $\pm$ 3.7	0	0 $\pm$ 0	0 $\pm$ 0
54 - South of Duck Key	49	3.06 $\pm$ 0.19	39.5 $\pm$ 2.4	14	0.88 $\pm$ 0.63	21.3 $\pm$ 3.0
53 - South of Ohio Key	22	1.38 $\pm$ 0.13	45.3 $\pm$ 3.8	10	0.63 $\pm$ 0.00	29.3 $\pm$ 4.6
Middle Florida Keys Total (9)	87	0.60 $\pm$ 0.34	39.1 $\pm$ 1.5	30	0.21 $\pm$ 0.11	23.3 $\pm$ 3.6
Lower Florida Keys NMS						
103 - North of Looe Key RO	41	2.56 $\pm$ 1.56	19.5 $\pm$ 1.8	0.9	0.25 $\pm$ 0.25	3.3 $\pm$ 0.9
102 - North of Maryland Shoal	51	3.19 $\pm$ 1.56	30.6 $\pm$ 2.6	1.8	2.88 $\pm$ 1.13	22.9 $\pm$ 1.8
101 - North of Maryland Shoal	24	1.50 $\pm$.63	8.0 $\pm$ 1.3	0.8	3.13 $\pm$ 0.88	12.3 $\pm$ 0.8
100 - North of Eastern Sambo RO	34	2.13 $\pm$ 0.13	12.8 $\pm$ 1.5	0.4	10.00 $\pm$ 2.75	13.4 $\pm$ 0.4
105 - Western Sambo ER**	17	1.06 $\pm$ 0.69	39.2 $\pm$ 4.7	1.8	2.44 $\pm$ 0.81	25.7 $\pm$ 1.8
104 - Western Sambo ER**	14	0.88 $\pm$ 0.00	27.4 $\pm$ 2.9	2.2	2.13 $\pm$ 1.00	22.6 $\pm$ 2.2
99 - West of Western Sambo ER	17	1.06 $\pm$ 0.06	22.0 $\pm$ 2.7	1.9	2.13 $\pm$ 0.75	13.5 $\pm$ 1.9
98 - Middle Ground	56	3.50 $\pm$ 1.63	23.1 $\pm$ 1.7	1.4	3.13 $\pm$ 1.25	18.3 $\pm$ 1.4
97 - Middle Ground	47	2.94 $\pm$ 0.56	23.5 $\pm$ 2.5	1.9	2.75 $\pm$ 0.25	15.5 $\pm$ 1.9
Lower Florida Keys Total (9)	301	2.09 $\pm$ 0.33	22.9 $\pm$ 3.1	461	3.20 $\pm$ 0.90	16.4 $\pm$ 2.3
Mid-channel Patch Reef Total (24)	519	1.35 $\pm$ 0.24	27.2 $\pm$ 2.3	516	1.34 $\pm$ 0.45	17.1 $\pm$ 2.0
<i>Offshore patch reefs</i>						
Upper Florida Keys NMS						
12 - South of BNP boundary	23	1.44 $\pm$ 0.56	18.1 $\pm$ 3.4	5	0.31 $\pm$ 0.06	12.7 $\pm$ 4.4
41 - North of Carysfort Reef SPA	6	0.38 $\pm$ 0.25	5.5 $\pm$ 0.8	2	0.13 $\pm$ 0.00	11.0 $\pm$ 5.0
11 - North of Carysfort Reef SPA	5	0.31 $\pm$ 0.19	4.8 $\pm$ 0.4	4	0.25 $\pm$ 0.00	16.5 $\pm$ 5.0
14 - Carysfort Reef SPA**	109	6.81 $\pm$ 1.31	24.8 $\pm$ 1.6	9	0.56 $\pm$ 0.31	16.7 $\pm$ 3.2
13 - Carysfort Reef SPA**	41	2.56 $\pm$ 1.56	20.2 $\pm$ 2.5	7	0.44 $\pm$ 0.19	7.7 $\pm$ 1.4
10 - North of Dry Rocks SPA	9	0.56 $\pm$ 0.06	7.4 $\pm$ 0.7	15	0.94 $\pm$ 0.19	17.5 $\pm$ 2.5
9 - SW of Grecian Rocks SPA	25	1.56 $\pm$ 0.31	19.4 $\pm$ 3.1	9	0.56 $\pm$ 0.19	14.8 $\pm$ 3.4
8 - Inshore of French Reef SPA	135	8.44 $\pm$ 1.19	27.8 $\pm$ 1.7	33	2.06 $\pm$ 1.19	14.9 $\pm$ 1.3
7 - Inshore of Pickles Reef	22	1.38 $\pm$ 0.00	6.9 $\pm$ 1.0	17	1.06 $\pm$ 0.31	20.6 $\pm$ 2.3
Upper Florida Keys Total (9)	375	2.60 $\pm$ 0.99	15.0 $\pm$ 3.0	101	0.70 $\pm$ 0.20	14.7 $\pm$ 1.3
Middle Florida Keys NMS						
65 - North of Davis Reef SPA	11	0.69 $\pm$ 0.31	3.5 $\pm$ 0.5	23	1.44 $\pm$ 0.19	11.9 $\pm$ 1.5
64 - North of Davis Reef SPA	44	2.75 $\pm$ 0.38	22.0 $\pm$ 1.8	8	0.50 $\pm$ 0.38	9.9 $\pm$ 3.1
63 - North of Davis Reef SPA	34	2.13 $\pm$ 0.25	17.1 $\pm$ 2.0	25	1.56 $\pm$ 0.69	13.2 $\pm$ 1.5
62 - North of Davis Reef SPA	21	1.31 $\pm$ 1.06	14.2 $\pm$ 2.2	56	3.50 $\pm$ 0.38	11.7 $\pm$ 1.0

Site number/site location	<i>Gorgonia ventalina</i>			<i>Muricea spp.</i>		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
88 - Coffins Patch SPA**	47	2.94 ± 0.19	32.2 ± 2.3	18	1.13 ± 0.38	16.7 ± 2.3
89 - Coffins Patch SPA**	39	2.44 ± 0.69	30.3 ± 2.2	25	1.56 ± 0.06	18.0 ± 1.9
Middle Florida Keys Total (6)	196	2.04 ± 0.36	19.9 ± 4.4	155	1.61 ± 0.41	13.6 ± 1.3
Lower Florida Keys NMS						
109 - East of Looe Key RO	48	3.00 ± 0.63	34.2 ± 2.6	29	1.81 ± 0.19	21.3 ± 1.8
110 - Looe Key Research Only**	20	1.25 ± 0.25	43.0 ± 4.6	17	1.06 ± 0.44	23.8 ± 2.6
111 - Looe Key Research Only**	45	2.81 ± 0.56	27.9 ± 2.6	27	1.69 ± 0.31	22.6 ± 2.0
107 - North of Pelican Shoal	18	1.13 ± 0.13	18.3 ± 3.9	75	4.69 ± 0.31	11.6 ± 1.0
112 - Western Sambo ER**	30	1.88 ± 0.25	35.2 ± 2.9	20	1.25 ± 0.88	25.6 ± 2.3
113 - Western Sambo ER**	3	0.19 ± 0.19	8.7 ± 2.3	55	3.44 ± 0.56	22.8 ± 1.8
106 - NE of E. Dry Rocks SPA	32	2.00 ± 0.00	19.3 ± 3.8	23	1.44 ± 0.19	18.3 ± 2.4
133 - NE of E. Dry Rocks SPA	10	0.63 ± 0.25	33.9 ± 5.7	16	1.00 ± 0.13	23.6 ± 3.5
Lower Florida Keys Total (8)	206	1.61 ± 0.35	27.6 ± 4.0	262	2.05 ± 0.47	21.2 ± 1.6
Offshore Patch Reef Total (23)	777	2.11 ± 0.41	20.6 ± 2.3	518	1.41 ± 0.24	16.7 ± 1.1
<i>Inner line reef tract spur & groove</i>						
Upper Florida Keys NMS						
32 - Turtle Rocks	24	1.50 ± 0.50	6.7 ± 0.9	7	0.44 ± 0.06	10.6 ± 3.0
31 - Inshore of Elbow Reef SPA	23	1.44 ± 0.81	4.7 ± 0.5	0	0 ± 0	0 ± 0
30 - North Dry Rocks	38	2.38 ± 0.75	22.2 ± 3.5	1	0.06 ± 0.06	14.0
34 - Dry Rocks SPA**	130	8.13 ± 0.00	17.5 ± 1.0	0	0 ± 0	0 ± 0
33 - Dry Rocks SPA**	216	13.5 ± 0.38	12.2 ± 0.7	2	0.13 ± 0.13	11.5 ± 0.5
36 - Grecian Rocks SPA**	87	5.44 ± 0.81	17.3 ± 15.9	4	0.25 ± 0.00	14.0 ± 6.0
35 - Grecian Rocks SPA**	97	6.06 ± 2.31	14.1 ± 1.6	1	0.06 ± 0.06	6.0
Upper Florida Keys Total (7)	615	5.49 ± 1.64	13.5 ± 2.4	15	0.13 ± 0.06	11.2 ± 1.5
Inner Line Spur & Groove Total (7)	615	5.49 ± 1.64	13.5 ± 2.4	15	0.13 ± 0.06	11.2 ± 1.5
<i>High-relief spur & groove</i>						
Upper Florida Keys NMS						
23 - Carysfort Reef SPA**	153	9.56 ± 1.44	20.4 ± 1.3	3	0.19 ± 0.19	13.0 ± 2.1
22 - Carysfort Reef SPA**	142	8.88 ± 2.63	18.0 ± 1.2	3	0.19 ± 0.06	27.0 ± 4.0
21 - Maitland grounding site	67	4.19 ± 1.56	19.7 ± 1.7	3	0.19 ± 0.19	29.0 ± 2.3
24 - Elbow Reef SPA**	88	5.50 ± 1.88	14.8 ± 1.2	4	0.25 ± 0.25	7.5 ± 0.9
223 - Elbow Reef SPA**	53	3.31 ± 0.81	22.4 ± 2.7	1	0.06 ± 0.06	7.0
19 - North of French Reef SPA	227	14.19 ± 0.94	20.2 ± 1.1	13	0.81 ± 0.19	12.5 ± 2.9
25 - French Reef SPA**	18	1.13 ± 0.00	11.1 ± 1.9	0	0 ± 0	0 ± 0
26 - French Reef SPA**	7	0.44 ± 0.31	5.7 ± 1.7	0	0 ± 0	0 ± 0
20 - Sand Island	35	2.19 ± 0.94	6.9 ± 0.9	1	0.06 ± 0.06	24.0
18 - Sand Island	74	4.63 ± 0.13	10.7 ± 1.2	2	0.13 ± 0.13	6.0 ± 0.0
28 - Molasses Reef SPA**	118	7.38 ± 4.63	27.5 ± 1.4	0	0 ± 0	0 ± 0
27 - Molasses Reef SPA**	56	3.50 ± 0.63	19.7 ± 2.2	0	0 ± 0	0 ± 0
17 - Pickles Reef	82	5.13 ± 0.88	11.1 ± 1.5	4	0.25 ± 0.00	13.3 ± 3.1
16 - Pickles Reef	24	1.50 ± 0.38	28.5 ± 3.9	0	0 ± 0	0 ± 0
15 - Pickles Reef	58	3.63 ± 2.75	4.0 ± 0.8	3	0.19 ± 0.19	13.7 ± 3.7
Upper Florida Keys Total (15)	1,202	5.01 ± 0.95	16.0 ± 2.0	37	0.15 ± 0.05	15.3 ± 2.7
Middle Florida Keys NMS						
67 - Delta Shoal	74	4.63 ± 0.13	14.7 ± 1.3	6	0.38 ± 0.13	17.5 ± 4.7
66 - Delta Shoal	39	2.44 ± 0.31	11.9 ± 1.9	27	1.69 ± 1.44	16.2 ± 1.5
69 - Sombrero Key SPA**	63	3.94 ± 1.19	17.2 ± 2.1	1	0.06 ± 0.06	21.0
266 - Sombrero Key SPA**	46	2.88 ± 0.38	25.7 ± 1.9	1	0.06 ± 0.06	15.0
Middle Florida Keys Total (4)	222	3.47 ± 0.50	17.4 ± 3.0	35	0.55 ± 0.39	17.4 ± 1.3
Lower Florida Keys NMS						
124 - Looe Key SPA**	15	0.94 ± 0.31	17.5 ± 2.9	0	0 ± 0	0 ± 0
123 - Looe Key SPA**	8	0.50 ± 0.13	7.0 ± 2.0	0	0 ± 0	0 ± 0
120 - American Shoal	66	4.13 ± 1.38	21.6 ± 2.2	11	0.69 ± 0.56	11.3 ± 2.1
122 - American Shoal	25	1.56 ± 0.69	9.4 ± 2.5	83	5.19 ± 0.44	13.8 ± 0.8
119 - Maryland Shoal	4	0.25 ± 0.25	15.0 ± 3.4	0	0 ± 0	0 ± 0
121 - Maryland Shoal	10	0.63 ± 0.63	23.3 ± 4.3	0	0 ± 0	0 ± 0

Site number/site location	<i>Gorgonia ventalina</i>			<i>Muricea</i> spp.		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
118 - Pelican Shoal	22	1.38 ± 0.88	170 ± 4.7	7	0.44 ± 0.19	11.9 ± 2.5
117 - Pelican Shoal	60	3.75 ± 0.25	13.6 ± 2.0	5	0.31 ± 0.19	14.4 ± 4.0
116 - No Name Reef	20	1.25 ± 0.25	14.7 ± 3.6	1	0.06 ± 0.06	30.0
322 - Eastern Sambo RO**	37	2.31 ± 0.44	10.5 ± 2.0	0	0 ± 0	0 ± 0
125 - Eastern Sambo RO**	52	3.25 ± 1.50	12.0 ± 1.5	7	0.44 ± 0.44	11.7 ± 2.3
127 - Western Sambo ER**	99	6.19 ± 2.19	10.2 ± 1.0	10	0.63 ± 0.13	9.3 ± 1.8
126 - Western Sambo ER**	51	3.19 ± 0.69	12.1 ± 1.4	4	0.25 ± 0.13	7.3 ± 1.1
115 - East of E. Dry Rocks SPA	27	1.69 ± 0.44	12.8 ± 2.8	0	0 ± 0	0 ± 0
129 - Eastern Dry Rocks SPA**	33	2.06 ± 1.31	13.6 ± 2.8	2	0.13 ± 0	25.5 ± 3.5
128 - Eastern Dry Rocks**	47	2.94 ± 0.56	9.8 ± 1.3	6	0.38 ± 0	8.5 ± 2.2
327 - Rock Key SPA**	75	4.69 ± 2.31	11.3 ± 1.3	1	0.06 ± 0.06	6.0
130 - Rock Key SPA**	81	5.06 ± 3.94	6.8 ± 0.8	1	0.06 ± 0.06	7.0
131 - Sand Key SPA**	60	3.75 ± 2.38	14.4 ± 1.7	4	0.25 ± 0.25	12.0 ± 7.0
328 - Sand Key SPA**	47	2.94 ± 0.19	14.7 ± 2.0	0	0 ± 0	0 ± 0
114 - Western Dry Rocks	33	2.06 ± 0.31	15.5 ± 2.1	0	0 ± 0	0 ± 0
Lower Florida Keys Total (21)	872	2.60 ± 0.35	13.5 ± 0.9	142	0.42 ± 0.24	13.0 ± 2.0
High-relief Spur & Groove Total (40)	2,296	3.59 ± 0.44	14.8 ± 0.9	214	0.33 ± 0.13	14.5 ± 1.4

Fore-reef (6-15 m)

Upper Florida Keys NMS

42 - South of BNP boundary	5	0.31 ± 0.06	3.8 ± 0.6	19	1.19 ± 0.56	17.9 ± 1.6
52 - Carysfort Reef SPA**	5	0.31 ± 0.19	5.0 ± 0.5	6	0.38 ± 0.25	9.2 ± 0.5
51 - Carysfort Reef SPA**	5	0.31 ± 0.06	9.8 ± 3.8	5	0.31 ± 0.06	12.2 ± 1.9
50 - SW of Carysfort Reef SPA	5	0.31 ± 0.06	7.8 ± 1.9	1	0.06 ± 0.06	13.0
40 - SW of Carysfort Reef SPA	1	0.06 ± 0.06	6.0	10	0.63 ± 0.38	14.4 ± 3.3
39 - North of Elbow Reef SPA	2	0.13 ± 0.00	9.0 ± 3.0	0	0 ± 0	0 ± 0
245 - Elbow Reef SPA**	21	1.31 ± 0.56	5.1 ± 0.5	0	0 ± 0	0 ± 0
46 - Elbow Reef SPA**	18	1.31 ± 0.25	4.3 ± 0.6	2	0.13 ± 0.13	11.0 ± 2.0
38 - SW of Elbow Reef SPA	6	0.38 ± 0.13	4.2 ± 0.5	10	0.63 ± 0.13	19.3 ± 2.6
49 - South of Elbow Reef SPA	3	0.19 ± 0.06	3.3 ± 0.7	1	0.06 ± 0.06	2.0
37 - Dixie Shoal	3	0.19 ± 0.19	2.3 ± 0.3	11	0.69 ± 0.44	6.5 ± 1.7
48 - Dixie Shoal	8	0.50 ± 0.13	4.6 ± 0.5	10	0.63 ± 0.00	7.7 ± 1.6
47 - SW of Molasses Reef SPA	16	1.00 ± 0.75	3.3 ± 0.2	5	0.31 ± 0.31	13.2 ± 3.0
Upper Florida Keys Total (13)	98	0.47 ± 0.11	5.3 ± 0.6	80	0.38 ± 0.10	11.5 ± 1.5

Middle Florida Keys NMS

81 - Conch Reef SPA**	2	0.13 ± 0.13	4.0 ± 0.0	14	0.88 ± 0.50	20.6 ± 2.2
80 - Conch Reef SPA**	0	0 ± 0	0 ± 0	4	0.25 ± 0.13	23.5 ± 6.3
82 - Conch Reef RO**	3	0.19 ± 0.19	6.0 ± 2.0	1	0.06 ± 0.06	13.0
279 - Conch Reef RO**	7	0.44 ± 0.31	4.7 ± 0.4	4	0.25 ± 0.13	7.0 ± 1.8
84 - Davis Reef SPA**	3	0.19 ± 0.19	4.0 ± 0.6	8	0.50 ± 0.25	7.3 ± 1.6
83 - Davis Reef SPA**	4	0.25 ± 0.00	2.8 ± 0.5	8	0.50 ± 0.25	14.1 ± 2.7
79 - SW of Crocker Reef	26	1.63 ± 0.50	8.6 ± 1.7	1	0.06 ± 0.06	13.0
78 - SW of Crocker Reef	15	0.94 ± 0.19	4.7 ± 0.4	5	0.31 ± 0.06	11.4 ± 2.7
85 - Alligator Reef SPA**	6	0.38 ± 0.25	2.7 ± 0.2	51	3.19 ± 0.06	17.4 ± 1.1
68 - Alligator Reef SPA**	7	0.44 ± 0.19	3.4 ± 0.4	31	1.94 ± 0.69	10.8 ± 0.9
77 - SW of Alligator Reef SPA	19	1.19 ± 0.06	8.3 ± 2.4	3	0.19 ± 0.06	12.3 ± 3.4
87 - Tennessee Reef RO**	10	0.63 ± 0.25	12.3 ± 2.8	16	1.00 ± 0.25	18.8 ± 3.1
86 - Tennessee Reef RO**	30	1.88 ± 0.38	18.7 ± 3.0	19	1.19 ± 0.06	12.1 ± 1.8
76 - NE of Tennessee Light	18	1.13 ± 0.25	17.9 ± 3.7	12	0.75 ± 0.00	20.1 ± 3.5
75 - East of Coffins Patch SPA	1	0.06 ± 0.06	7.0	0	0 ± 0	0 ± 0
293 - Sombrero Key SPA**	13	0.81 ± 0.06	5.3 ± 1.2	14	0.88 ± 0.25	12.9 ± 1.3
96 - Sombrero Key SPA**	5	0.31 ± 0.06	4.2 ± 0.7	34	2.13 ± 0.13	18.2 ± 1.4
73 - West of Sombrero Key SPA	10	0.63 ± 0.00	7.5 ± 2.5	6	0.38 ± 0.00	17.3 ± 3.8
71 - South of Moser Channel	10	0.63 ± 0.38	7.6 ± 1.8	11	0.69 ± 0.56	14.3 ± 1.5
72 - South of Moser Channel	21	1.31 ± 0.94	4.7 ± 0.4	7	0.44 ± 0.19	12.9 ± 3.3
70 - South of Moser Channel	3	0.19 ± 0.06	11.7 ± 8.2	11	0.69 ± 0.19	13.7 ± 2.7
90 - South of Moser Channel	2	0.13 ± 0.00	3.0 ± 1.0	0	0 ± 0	0 ± 0
Middle Florida Keys Total (22)	215	0.61 ± 0.11	7.1 ± 1.0	260	0.74 ± 0.17	14.5 ± 1.0

Lower Florida Keys NMS

Site number/site location	<i>Gorgonia ventalina</i>			<i>Muricea</i> spp.		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
136 - South of Bahia Honda Key	0	0 ± 0	0 ± 0	6	0.38 ± 0.25	17.3 ± 4.7
138 - Looe Key SPA**	13	0.81 ± 0.31	8.9 ± 1.9	29	1.81 ± 0.44	10.8 ± 1.4
137 - Looe Key SPA**	14	0.88 ± 0.50	7.2 ± 2.3	14	0.88 ± 0.25	11.8 ± 1.5
135 - American Shoal	12	0.75 ± 0.25	4.7 ± 0.5	15	0.94 ± 0.19	9.6 ± 1.2
134 - American Shoal	37	2.31 ± 0.56	3.6 ± 0.2	78	4.88 ± 0.38	10.7 ± 0.7
139 - American Shoal	46	2.88 ± 0.75	3.7 ± 0.3	74	4.63 ± 0.88	11.9 ± 0.7
336 - American Shoal	55	3.44 ± 0.69	4.5 ± 0.2	46	2.88 ± 0.75	9.3 ± 0.9
141 - American Shoal	13	0.81 ± 0.44	3.5 ± 0.7	39	2.44 ± 1.06	8.6 ± 0.8
140 - East of Eastern Sambo RO	4	0.25 ± 0.25	4.5 ± 0.3	14	0.88 ± 0.88	10.2 ± 1.2
143 - Eastern Sambo RO**	28	1.75 ± 0.50	3.3 ± 0.2	62	3.88 ± 0.50	11.1 ± 0.8
132 - Eastern Sambo RO**	10	0.63 ± 0.25	4.2 ± 0.8	11	0.69 ± 0.06	12.6 ± 1.3
346 - Middle Sambo Reef	29	1.81 ± 0.69	3.6 ± 0.4	43	2.69 ± 0.06	10.7 ± 0.9
149 - Middle Sambo Reef	36	2.25 ± 0.63	5.1 ± 0.4	26	1.63 ± 1.25	8.7 ± 0.6
347 - Western Sambo ER**	3	0.19 ± 0.06	5.0 ± 0.6	10	0.63 ± 0.38	8.7 ± 0.9
150 - Western Sambo ER**	18	1.13 ± 0.88	3.9 ± 0.4	25	1.56 ± 0.69	7.8 ± 0.8
142 - Western Sambo ER**	11	0.69 ± 0.06	7.6 ± 1.9	8	0.50 ± 0.38	13.3 ± 2.7
Lower Florida Keys Total (16)	329	1.29 ± 0.25	4.9 ± 0.4	500	1.95 ± 0.37	10.8 ± 0.6
Fore-reef Total (51)	642	0.79 ± 0.11	5.9 ± 0.5	840	1.03 ± 0.16	12.6 ± 0.6

Table 10. Numbers of colonies (N), mean $\pm$ 1 SE colony densities (no. per m²), and mean $\pm$ 1 SE colony heights for *Muriceopsis flavida* and *Plexaura* gorgonians in the Florida Keys National Marine Sanctuary, as determined from surveys of two 8-m x 1-m transects per site at 145 locations during June-September 2008. Sites are arranged by habitat from northeast to southwest and asterisked locations (**) are Sanctuary Preservation Areas (SPA), Ecological Reserves (ER), or Research Only Areas (RO).

Site number/site location	<i>Muriceopsis flavida</i>			<i>Plexaura</i> spp.		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
<i>Mid-channel patch reefs</i>						
Upper Florida Keys NMS						
6 - Basin Hill Shoals	27	1.69 $\pm$ 0.19	31.3 $\pm$ 3.0	19	1.19 $\pm$ 0.56	22.1 $\pm$ 4.4
5 - Basin Hill Shoals	8	0.50 $\pm$ 0.00	37.3 $\pm$ 7.6	8	0.50 $\pm$ 0.00	18.0 $\pm$ 3.7
4 - Inshore of Grecian Rocks SPA	1	0.06 $\pm$ 0.06	20.0	62	3.88 $\pm$ 0.25	22.5 $\pm$ 1.9
3 - South of Cannon Patch Reef	1	0.06 $\pm$ 0.06	25.	45	2.81 $\pm$ 0.69	32.9 $\pm$ 3.1
2 - Mosquito Bank	0	0 $\pm$ 0	0 $\pm$ 0	58	3.63 $\pm$ 0.25	44.5 $\pm$ 2.7
1 - Inshore of Molasses Reef	23	1.44 $\pm$ 1.19	15.6 $\pm$ 1.9	9	0.56 $\pm$ 0.31	43.9 $\pm$ 9.9
Upper Florida Keys Total (6)	60	0.63 $\pm$ 0.31	25.8 $\pm$ 3.9	201	2.09 $\pm$ 0.63	30.7 $\pm$ 4.7
Middle Florida Keys NMS						
56 - Tavernier Rocks	0	0 $\pm$ 0	0 $\pm$ 0	3	0.19 $\pm$ 0.06	34.0 $\pm$ 11.5
55 - Tavernier Rocks	0	0 $\pm$ 0	0 $\pm$ 0	0	0 $\pm$ 0	0 $\pm$ 0
59 - Hen and Chickens SPA**	0	0 $\pm$ 0	0 $\pm$ 0	4	0.25 $\pm$ 0.00	27.5 $\pm$ 10.7
58 - Hen and Chickens SPA**	0	0 $\pm$ 0	0 $\pm$ 0	7	0.44 $\pm$ 0.06	42.1 $\pm$ 11.1
61 - Cheeca Rocks SPA**	0	0 $\pm$ 0	0 $\pm$ 0	1	0.06 $\pm$ 0.06	67.0
60 - Cheeca Rocks SPA**	0	0 $\pm$ 0	0 $\pm$ 0	0	0 $\pm$ 0	0 $\pm$ 0
57 - NE of Cheeca Rocks SPA	0	0 $\pm$ 0	0 $\pm$ 0	1	0.06 $\pm$ 0.06	55.0
54 - South of Duck Key	0.06	0.06 $\pm$ 0.06	26.0	12	0.75 $\pm$ 0.38	37.4 $\pm$ 6.4
53 - South of Ohio Key	0	0 $\pm$ 0	0 $\pm$ 0	15	0.94 $\pm$ 0.31	26.3 $\pm$ 5.6
Middle Florida Keys Total (9)	1	0.01 $\pm$ 0.01	26.0	43	0.30 $\pm$ 0.11	41.3 $\pm$ 5.6
Lower Florida Keys NMS						
103 - North of Looe Key RO	0	0 $\pm$ 0	0 $\pm$ 0	3	0.19 $\pm$ 0.06	8.3 $\pm$ 3.0
102 - North of Maryland Shoal	0	0 $\pm$ 0	0 $\pm$ 0	110	6.88 $\pm$ 0.00	31.1 $\pm$ 1.7
101 - North of Maryland Shoal	0	0 $\pm$ 0	0 $\pm$ 0	23	1.44 $\pm$ 0.06	13.5 $\pm$ 2.4
100 - North of Eastern Sambo RO	0	0 $\pm$ 0	0 $\pm$ 0	77	4.81 $\pm$ 0.69	18.2 $\pm$ 1.8
105 - Western Sambo ER**	1	0.06 $\pm$ 0.06	20.0	79	4.94 $\pm$ 0.06	31.9 $\pm$ 2.0
104 - Western Sambo ER**	15	0.94 $\pm$ 0.31	24.9 $\pm$ 2.5	98	6.13 $\pm$ 2.38	29.1 $\pm$ 1.6
99 - West of Western Sambo ER	4	0.25 $\pm$ 0.00	17.5 $\pm$ 10.9	41	2.56 $\pm$ 0.56	19.5 $\pm$ 2.2
98 - Middle Ground	6	0.38 $\pm$ 0.13	18.7 $\pm$ 3.3	85	5.31 $\pm$ 2.19	24.3 $\pm$ 1.7
97 - Middle Ground	8	0.50 $\pm$ 0.00	20.1 $\pm$ 3.3	83	5.19 $\pm$ 2.06	17.4 $\pm$ 1.4
Lower Florida Keys Total (9)	34	0.24 $\pm$ 0.11	20.2 $\pm$ 1.3	599	4.16 $\pm$ 0.75	21.5 $\pm$ 2.7
Mid-channel Patch Reef Total (24)	95	0.25 $\pm$ 0.10	23.3 $\pm$ 2.4	843	2.20 $\pm$ 0.48	30.3 $\pm$ 3.0
<i>Offshore patch reefs</i>						
Upper Florida Keys NMS						
12 - South of BNP boundary	9	0.56 $\pm$ 0.19	15.4 $\pm$ 4.3	24	1.50 $\pm$ 0.50	10.7 $\pm$ 1.5
41 - North of Carysfort Reef SPA	12	0.75 $\pm$ 0.13	25.5 $\pm$ 4.0	13	0.81 $\pm$ 0.19	23.7 $\pm$ 7.0
11 - North of Carysfort Reef SPA	3	0.19 $\pm$ 0.06	6.3 $\pm$ 1.9	25	1.56 $\pm$ 0.56	21.4 $\pm$ 3.0
14 - Carysfort Reef SPA**	12	0.75 $\pm$ 0.63	11.3 $\pm$ 1.2	20	1.25 $\pm$ 0.25	35.0 $\pm$ 5.3
13 - Carysfort Reef SPA**	19	1.19 $\pm$ 0.31	18.1 $\pm$ 3.7	8	0.50 $\pm$ 0.25	35.6 $\pm$ 7.4
10 - North of Dry Rocks SPA	5	0.31 $\pm$ 0.19	13.4 $\pm$ 7.3	6	0.38 $\pm$ 0.00	20.3 $\pm$ 5.9
9 - SW of Grecian Rocks SPA	9	0.56 $\pm$ 0.44	10.9 $\pm$ 2.8	16	1.00 $\pm$ 0.38	25.9 $\pm$ 4.5
8 - Inshore of French Reef SPA	34	2.13 $\pm$ 1.25	15.6 $\pm$ 1.7	29	1.81 $\pm$ 1.56	17.3 $\pm$ 2.4
7 - Inshore of Pickles Reef	3	0.19 $\pm$ 0.06	2.7 $\pm$ 0.3	10	0.63 $\pm$ 0.38	20.6 $\pm$ 5.5
Upper Florida Keys Total (9)	106	0.74 $\pm$ 0.20	13.2 $\pm$ 2.2	151	1.05 $\pm$ 0.17	23.4 $\pm$ 2.7
Middle Florida Keys NMS						
65 - North of Davis Reef SPA	14	0 $\pm$ 0	0 $\pm$ 0	6.6	0.88 $\pm$ 0.25	25.4 $\pm$ 6.6
64 - North of Davis Reef SPA	17	1.19 $\pm$ 0.31	14.8 $\pm$ 3.4	4.1	1.06 $\pm$ 0.69	28.5 $\pm$ 4.1
63 - North of Davis Reef SPA	28	1.06 $\pm$ 0.19	10.2 $\pm$ 1.5	3.3	1.75 $\pm$ 0.38	21.0 $\pm$ 3.3
62 - North of Davis Reef SPA	62	0.81 $\pm$ 0.06	8.0 $\pm$ 1.6	2.1	3.88 $\pm$ 1.88	16.7 $\pm$ 2.1
89 - Coffins Patch SPA**	17	0.06 $\pm$ 0.06	16.0	4.1	1.06 $\pm$ 0.44	21.6 $\pm$ 4.1

Site number/site location	<i>Muriceopsis flavida</i>			<i>Plexaura</i> spp.		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
88 - Coffins Patch SPA**	9	0.56 ± 0.06	18.3 ± 4.3	18	1.13 ± 0.38	19.9 ± 4.3
Middle Florida Keys Total (6)	59	0.61 ± 0.20	13.5 ± 1.9	156	1.63 ± 0.47	22.2 ± 1.7
Lower Florida Keys NMS						
109 - East of Looe Key RO	2	0.13 ± 0.13	5.5 ± 0.5	37	2.31 ± 0.06	25.2 ± 2.2
110 - Looe Key Research Only**	2	0.13 ± 0.00	24.0 ± 9.0	65	4.06 ± 0.56	29.2 ± 2.4
111 - Looe Key Research Only**	14	0.88 ± 0.13	21.0 ± 2.7	45	2.81 ± 0.56	23.0 ± 2.3
107 - North of Pelican Shoal	12	0.75 ± 0.50	14.3 ± 2.5	48	3.00 ± 1.38	11.8 ± 1.5
112 - Western Sambo ER**	4	0.25 ± 0.00	27.3 ± 5.5	48	3.00 ± 0.75	29.1 ± 2.1
113 - Western Sambo ER**	22	1.38 ± 0.00	18.1 ± 2.3	34	2.13 ± 0.13	22.4 ± 1.8
106 - NE of E. Dry Rocks SPA	6	0.38 ± 0.00	13.3 ± 3.9	78	4.88 ± 2.25	24.4 ± 1.9
133 - NE of E. Dry Rocks SPA	8	0.50 ± 0.38	32.6 ± 4.5	27	1.69 ± 0.19	25.0 ± 2.4
Lower Florida Keys Total (8)	70	0.55 ± 0.15	19.5 ± 3.0	382	2.98 ± 0.37	23.8 ± 1.9
Offshore Patch Reef Total (23)	235	0.64 ± 0.11	15.6 ± 1.6	689	1.87 ± 0.25	23.2 ± 1.3
<i>Inner line reef tract spur & groove</i>						
Upper Florida Keys NMS						
32 - Turtle Rocks	0	0 ± 0	0 ± 0	93	5.81 ± 1.56	20.1 ± 1.5
31 - Inshore of Elbow Reef SPA	11	0.69 ± 0.31	31.3 ± 5.4	17	1.06 ± 0.44	14.6 ± 2.9
30 - North Dry Rocks	10	0.63 ± 0.25	15.8 ± 2.9	12	0.75 ± 0.50	22.1 ± 4.5
34 - Dry Rocks SPA**	43	2.69 ± 1.69	11.7 ± 1.5	4	0.25 ± 0.13	29.0 ± 12.2
33 - Dry Rocks SPA**	80	5.00 ± 1.00	12.2 ± 1.0	4	0.25 ± 0.00	27.8 ± 18.1
36 - Grecian Rocks SPA**	53	3.31 ± 0.69	8.7 ± 5.0	2	0.13 ± 0.13	17.5 ± 13.4
35 - Grecian Rocks SPA**	36	2.25 ± 1.75	9.1 ± 1.5	8	0.50 ± 0.25	29.8 ± 8.6
Upper Florida Keys Total (7)	233	2.08 ± 0.67	14.8 ± 3.5	140	1.25 ± 0.77	23.0 ± 2.3
Inner Line Spur & Groove Total (7)	233	2.08 ± 0.67	14.8 ± 3.5	140	1.25 ± 0.77	23.0 ± 2.3
<i>High-relief spur & groove</i>						
Upper Florida Keys NMS						
23 - Carysfort Reef SPA**	5	0.31 ± 0.31	15.6 ± 1.1	3	0.19 ± 0.06	20.7 ± 4.7
22 - Carysfort Reef SPA**	6	0.38 ± 0.13	16.2 ± 3.6	8	0.50 ± 0.25	34.1 ± 8.7
21 - Maitland grounding site	1	0.06 ± 0.06	33.0	4	0.25 ± 0.13	45.0 ± 9.4
24 - Elbow Reef SPA**	1	0.06 ± 0.06	16.0 ± 0	4	0.25 ± 0.25	23.8 ± 10.9
223 - Elbow Reef SPA**	3	0.19 ± 0.19	8.7 ± 1.8	0	0 ± 0	0 ± 0
19 - North of French Reef SPA	2	0.13 ± 0.13	23.0 ± 2.0	4	0.25 ± 0.13	30.5 ± 5.9
25 - French Reef SPA**	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
26 - French Reef SPA**	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
20 - Sand Island	0	0 ± 0	0 ± 0	1	0.06 ± 0.06	3.0
18 - Sand Island	2	0.13 ± 0.00	10.0 ± 1.0	3	0.19 ± 0.06	19.7 ± 8.4
28 - Molasses Reef SPA**	0	0 ± 0	0 ± 0	5	0.31 ± 0.31	42.2 ± 10.2
27 - Molasses Reef SPA**	0	0 ± 0	0 ± 0	2	0.13 ± 0.00	27.0 ± 19.0
17 - Pickles Reef	1	0.06 ± 0.06	22.0	3	0.19 ± 0.19	17.0 ± 5.0
16 - Pickles Reef	0	0 ± 0	0 ± 0	7	0.44 ± 0.06	14.4 ± 6.1
15 - Pickles Reef	3	0.19 ± 0.19	16.0 ± 4.0	0	0 ± 0	0 ± 0
Upper Florida Keys Total (15)	24	0.10 ± 0.03	17.8 ± 2.5	44	0.18 ± 0.04	25.2 ± 3.7
Middle Florida Keys NMS						
67 - Delta Shoal	1	0.06 ± 0.06	12.0	1	0.06 ± 0.06	39.0
66 - Delta Shoal	8	0.50 ± 0.00	10.5 ± 4.0	4	0.25 ± 0.13	26.5 ± 8.0
69 - Sombrero Key SPA**	3	0.19 ± 0.19	2.7 ± 0.3	1	0.06 ± 0.06	35.0
266 - Sombrero Key SPA**	3	0.19 ± 0.19	8.3 ± 2.2	1	0.06 ± 0.06	7.0
Middle Florida Keys Total (4)	15	0.23 ± 0.09	8.4 ± 2.0	7	0.11 ± 0.05	26.9 ± 7.1
Lower Florida Keys NMS						
124 - Looe Key SPA**	0	0 ± 0	0 ± 0	7.4	0.31 ± 0.06	40.2 ± 7.4
123 - Looe Key SPA**	0	0 ± 0	0 ± 0	11.7	0.25 ± 0.00	57.3 ± 11.7
120 - American Shoal	0	0 ± 0	0 ± 0	9.1	0.25 ± 0.13	24.5 ± 9.1
122 - American Shoal	17	1.06 ± 0.06	15.6 ± 3.2	2.9	2.31 ± 0.06	20.3 ± 2.9
119 - Maryland Shoal	0	0 ± 0	0 ± 0	5.6	0.75 ± 0.25	27.7 ± 5.6
121 - Maryland Shoal	0	0 ± 0	0 ± 0	1.2	0.19 ± 0.06	22.3 ± 1.2
118 - Pelican Shoal	1	0.06 ± 0.06	2.0	0.5	0.13 ± 0.13	8.5 ± 0.5
117 - Pelican Shoal	1	0.06 ± 0.06	7.0	2.1	0.81 ± 0.44	10.3 ± 2.1

Site number/site location	<i>Muriceopsis flavida</i>			<i>Plexaura</i> spp.		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
116 - No Name Reef	0	0 ± 0	0 ± 0	5	0.31 ± 0.06	16.4 ± 5.9
322 - Eastern Sambo RO**	0	0 ± 0	0 ± 0	11	0.69 ± 0.06	18.8 ± 5.0
125 - Eastern Sambo RO**	2	0.13 ± 0.13	13.5 ± 4.5	4	0.25 ± 0.13	6.5 ± 2.3
127 - Western Sambo ER**	0	0 ± 0	0 ± 0	6	0.38 ± 0.25	5.8 ± 2.5
126 - Western Sambo ER**	0	0 ± 0	0 ± 0	4	0.25 ± 0.25	1.0 ± 0.0
115 - East of E. Dry Rocks SPA	0	0 ± 0	0 ± 0	4	0.25 ± 0.00	25.3 ± 13.8
129 - Eastern Dry Rocks SPA**	0	0 ± 0	0 ± 0	5	0.31 ± 0.06	11.4 ± 4.9
128 - Eastern Dry Rocks**	0	0 ± 0	0 ± 0	3	0.19 ± 0.19	1.7 ± 0.3
327 - Rock Key SPA**	0	0 ± 0	0 ± 0	10	0.63 ± 0.00	13.2 ± 4.3
130 - Rock Key SPA**	0	0 ± 0	0 ± 0	10	0.63 ± 0.25	11.2 ± 3.8
131 - Sand Key SPA**	0	0 ± 0	0 ± 0	6	0.38 ± 0.25	6.5 ± 2.1
328 - Sand Key SPA**	0	0 ± 0	0 ± 0	2	0.13 ± 0.13	16.5 ± 15.5
114 - Western Dry Rocks	0	0 ± 0	0 ± 0	2	0.13 ± 0.13	22.5 ± 19.5
Lower Florida Keys Total (21)	21	0.06 ± 0.05	9.5 ± 3.1	152	0.45 ± 0.10	17.5 ± 2.9
High-relief Spur & Groove Total (40)	60	0.09 ± 0.03	13.7 ± 1.9	203	0.32 ± 0.06	20.9 ± 2.2
<i>Fore-reef (6-15 m)</i>						
Upper Florida Keys NMS						
42 - South of BNP boundary	27	1.69 ± 1.19	27.1 ± 2.7	6	0.38 ± 0.25	29.0 ± 10.7
52 - Carysfort Reef SPA**	2	0.13 ± 0.13	11.5 ± 2.5	5	0.31 ± 0.31	14.4 ± 6.5
51 - Carysfort Reef SPA**	1	0.06 ± 0.06	4.0	0	0 ± 0	0 ± 0
50 - SW of Carysfort Reef SPA	0	0 ± 0	0 ± 0	2	0.13 ± 0.00	50.5 ± 7.5
40 - SW of Carysfort Reef SPA	33	2.06 ± 0.44	21.8 ± 2.0	13	0.81 ± 0.56	21.5 ± 2.4
39 - North of Elbow Reef SPA	0	0 ± 0	0 ± 0	1	0.06 ± 0.06	2.0
245 - Elbow Reef SPA**	1	0.06 ± 0.06	4.0	1	0.06 ± 0.06	2.0
46 - Elbow Reef SPA**	4	0.25 ± 0.25	5.5 ± 0.9	6	0.38 ± 0.13	19.2 ± 8.4
38 - SW of Elbow Reef SPA	7	0.44 ± 0.06	23.1 ± 4.2	4	0.25 ± 0.13	13.8 ± 6.6
49 - South of Elbow Reef SPA	1	0.06 ± 0.06	15.0	0	0 ± 0	0 ± 0
37 - Dixie Shoal	0	0 ± 0	0 ± 0	6	0.38 ± 0.00	18.2 ± 6.4
48 - Dixie Shoal	7	0.44 ± 0.31	5.1 ± 1.5	6	0.38 ± 0.13	9.2 ± 1.9
47 - SW of Molasses Reef SPA	0	0 ± 0	0 ± 0	3	0.19 ± 0.19	7.7 ± 2.0
Upper Florida Keys Total (13)	83	0.40 ± 0.19	13.0 ± 3.0	53	0.25 ± 0.06	17.0 ± 4.2
Middle Florida Keys NMS						
81 - Conch Reef SPA**	0	0 ± 0	0 ± 0	1	0.06 ± 0.06	48.0
80 - Conch Reef SPA**	4	0.25 ± 0.25	22.0 ± 4.1	0	0 ± 0	0 ± 0
82 - Conch Reef RO**	0	0 ± 0	0 ± 0	2	0.13 ± 0.00	28.0 ± 6/0
279 - Conch Reef RO**	6	0.38 ± 0.13	20.0 ± 5.1	2	0.13 ± 0.13	5.5 ± 0.5
84 - Davis Reef SPA**	1	0.06 ± 0.06	5.0	2	0.13 ± 0.13	41.5 ± 40.5
83 - Davis Reef SPA**	4	0.25 ± 0.13	19.3 ± 15.3	0	0 ± 0	0 ± 0
79 - SW of Crocker Reef	1	0.06 ± 0.06	6.0	0	0 ± 0	0 ± 0
78 - SW of Crocker Reef	0	0 ± 0	0 ± 0	3	0.19 ± 0.06	21.3 ± 16.3
85 - Alligator Reef SPA**	6	0.38 ± 0.25	14.7 ± 4.7	6	0.38 ± 0.00	23.0 ± 4.6
68 - Alligator Reef SPA**	10	0.63 ± 0.00	14.0 ± 5.3	8	0.50 ± 0.38	17.4 ± 3.6
77 - SW of Alligator Reef SPA	3	0.19 ± 0.06	15.0 ± 6.2	2	0.13 ± 0.13	26.5 ± 4.5
87 - Tennessee Reef RO**	5	0.31 ± 0.06	28.2 ± 5.5	4	0.25 ± 0.13	24.5 ± 11.5
86 - Tennessee Reef RO**	12	0.75 ± 0.38	3.5 ± 0.6	3	0.19 ± 0.06	11.3 ± 3.8
76 - NE of Tennessee Light	3	0.19 ± 0.19	9.0 ± 1.7	3	0.19 ± 0.19	45.3 ± 3.5
75 - East of Coffins Patch SPA	0	0 ± 0	0 ± 0	1	0.06 ± 0.06	23.0
293 - Sombrero Key SPA**	1	0.06 ± 0.06	13.0	7	0.44 ± 0.31	15.6 ± 5.1
96 - Sombrero Key SPA**	7	0.44 ± 0.31	22.3 ± 8.7	3	0.19 ± 0.06	9.0 ± 5.1
73 - West of Sombrero Key SPA	4	0.25 ± 0.25	31.5 ± 11.9	4	0.25 ± 0.25	28.0 ± 3.9
71 - South of Moser Channel	1	0.06 ± 0.06	3.0	6	0.38 ± 0.38	10.0 ± 3.4
72 - South of Moser Channel	0	0 ± 0	0 ± 0	5	0.31 ± 0.31	17.2 ± 6.9
70 - South of Moser Channel	3	0.19 ± 0.19	28.7 ± 4.4	6	0.38 ± 0.38	43.8 ± 13.7
90 - South of Moser Channel	0	0 ± 0	0 ± 0	4	0.25 ± 0.25	22.8 ± 10.3
Middle Florida Keys Total (22)	71	0.20 ± 0.05	15.9 ± 2.3	72	0.20 ± 0.03	24.3 ± 2.9
Lower Florida Keys NMS						
136 - South of Bahia Honda Key	1	0.06 ± 0.06	9.0	4	0.25 ± 0.13	19.0 ± 8.6

Site number/site location	<i>Muriceopsis flavida</i>			<i>Plexaura</i> spp.		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
138 - South of Bahia Honda Key	4	0.25 ± 0.25	18.5 ± 6.8	7.4	0.63 ± 0.13	36.9 ± 7.4
137 - South of Bahia Honda Key	10	0.63 ± 0.13	16.8 ± 3.4	1.6	0.31 ± 0.06	9.2 ± 1.6
135 - West of Looe Key SPA	2	0.13 ± 0.13	14.0 ± 2.0	4.2	0.63 ± 0.13	20.6 ± 4.2
134 - West of Pelican Shoal	6	0.38 ± 0.25	5.2 ± 1.2	1.7	3.25 ± 1.25	8.9 ± 1.7
139 - Eastern Sambo RO**	1	0.06 ± 0.06	9.0	1.5	2.44 ± 0.19	7.0 ± 1.5
336 - Eastern Sambo RO**	3	0.19 ± 0.06	5.0 ± 0.6	3.2	1.00 ± 0.38	8.1 ± 3.2
141 - Western Sambo ER**	0	0 ± 0	0 ± 0	4.8	0.63 ± 0.50	11.9 ± 4.8
140 - Western Sambo ER**	8	0.50 ± 0.50	16.9 ± 5.4	10.7	0.25 ± 0.25	20.3 ± 10.7
143 - West of Western Sambo	15	0.94 ± 0.44	16.0 ± 3.3	3.4	1.75 ± 0.25	12.9 ± 3.4
132 - East of E. Dry Rocks SPA	1	0.06 ± 0.06	42.0	2.9	0.88 ± 0.00	16.3 ± 2.9
346 - Rock Key SPA**	1	0.06 ± 0.06	6.0	2.7	1.63 ± 0.63	15.6 ± 2.7
149 - Rock Key SPA**	1	0.06 ± 0.06	4.0	4.0	0.13 ± 0.00	13.0 ± 4.0
347 - Sand Key SPA**	1	0.06 ± 0.06	3.0	2.4	0.75 ± 0.50	11.8 ± 2.4
150 - Sand Key SPA**	4	0.25 ± 0.00	6.8 ± 1.8	2.8	0.75 ± 0.63	10.3 ± 2.8
142 - SW of Sand Key SPA	1	0.06 ± 0.06	5.0	4.9	0.19 ± 0.06	14.3 ± 4.9
Lower Florida Keys Total (16)	59	0.23 ± 0.06	11.8 ± 2.6	247	0.96 ± 0.22	14.7 ± 1.8
Fore-reef Total (51)	213	0.26 ± 0.06	13.7 ± 1.5	372	0.46 ± 0.09	19.2 ± 1.8

Table 11. Numbers of colonies (N), mean $\pm$ 1 SE colony densities (no. per m²), and mean $\pm$ 1 SE colony heights for *Plexaurella* and *Pseudoplexaura* gorgonians in the Florida Keys National Marine Sanctuary, as determined from surveys of two 8-m x 1-m transects per site at 145 locations during June-September 2008. Sites are arranged by habitat from northeast to southwest and asterisked locations (**) are Sanctuary Preservation Areas (SPA), Ecological Reserves (ER), or Research Only Areas (RO).

Site number/site location	<i>Plexaurella</i> spp.			<i>Pseudoplexaura</i> spp.		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
<i>Mid-channel patch reefs</i>						
Upper Florida Keys NMS						
6 - Basin Hill Shoals	21	1.31 $\pm$ 0.06	18.6 $\pm$ 2.8	47	2.94 $\pm$ 0.94	18.0 $\pm$ 2.4
5 - Basin Hill Shoals	5	0.31 $\pm$ 0.19	29.6 $\pm$ 8.2	51	3.19 $\pm$ 0.31	38.0 $\pm$ 3.5
4 - Inshore of Grecian Rocks SPA	15	0.94 $\pm$ 0.19	44.5 $\pm$ 6.0	64	4.00 $\pm$ 0.63	34.8 $\pm$ 4.3
3 - South of Cannon Patch Reef	3	0.19 $\pm$ 0.06	12.3 $\pm$ 6.6	83	5.19 $\pm$ 2.44	21.5 $\pm$ 2.0
2 - Mosquito Bank	7	0.44 $\pm$ 0.06	40.4 $\pm$ 5.1	27	1.69 $\pm$ 0.19	33.9 $\pm$ 4.1
1 - Inshore of Molasses Reef	4	0.25 $\pm$ 0.25	18.0 $\pm$ 5.7	5	0.31 $\pm$ 0.31	8.2 $\pm$ 1.1
Upper Florida Keys Total (6)	55	0.57 $\pm$ 0.18	27.3 $\pm$ 5.4	277	2.89 $\pm$ 0.70	25.7 $\pm$ 4.8
Middle Florida Keys NMS						
56 - Tavernier Rocks	0	0 $\pm$ 0	0 $\pm$ 0	3	0.19 $\pm$ 0.19	34.0 $\pm$ 4.0
55 - Tavernier Rocks	0	0 $\pm$ 0	0 $\pm$ 0	1	0.06 $\pm$ 0.06	111.0
59 - Hen and Chickens SPA**	0	0 $\pm$ 0	0 $\pm$ 0	12	0.75 $\pm$ 0.00	56.6 $\pm$ 10.4
58 - Hen and Chickens SPA**	0	0 $\pm$ 0	0 $\pm$ 0	18	1.13 $\pm$ 0.50	58.6 $\pm$ 9.7
61 - Cheeca Rocks SPA**	0	0 $\pm$ 0	0 $\pm$ 0	4	0.25 $\pm$ 0.25	75.0 $\pm$ 9.6
60 - Cheeca Rocks SPA**	0	0 $\pm$ 0	0 $\pm$ 0	1	0.06 $\pm$ 0.06	14.0
57 - NE of Cheeca Rocks SPA	0	0 $\pm$ 0	0 $\pm$ 0	8	0.50 $\pm$ 0.25	62.1 $\pm$ 8.7
54 - South of Duck Key	10	0.63 $\pm$ 0.13	36.3 $\pm$ 6.6	17	1.06 $\pm$ 0.19	45.5 $\pm$ 7.1
53 - South of Ohio Key	2	0.13 $\pm$ 0.13	36.0 $\pm$ 7.0	31	1.94 $\pm$ 0.31	39.9 $\pm$ 4.3
Middle Florida Keys Total (9)	12	0.08 $\pm$ 0.07	36.2 $\pm$ 0.1	95	0.66 $\pm$ 0.21	55.2 $\pm$ 9.2
Lower Florida Keys NMS						
103 - North of Looe Key RO	0	0 $\pm$ 0	0 $\pm$ 0	0	0 $\pm$ 0	0 $\pm$ 0
102 - North of Maryland Shoal	6	0.38 $\pm$ 0.13	25.0 $\pm$ 6.3	106	6.63 $\pm$ 1.50	34.6 $\pm$ 2.4
101 - North of Maryland Shoal	1	0.06 $\pm$ 0.06	5.0 $\pm$ 0	8	0.50 $\pm$ 0.25	10.8 $\pm$ 2.2
100 - North of Eastern Sambo RO	9	0.56 $\pm$ 0.06	16.9 $\pm$ 2.6	36	2.25 $\pm$ 0.63	18.5 $\pm$ 2.4
105 - Western Sambo ER**	6	0.38 $\pm$ 0.25	25.7 $\pm$ 3.7	51	3.19 $\pm$ 0.81	54.1 $\pm$ 4.5
104 - Western Sambo ER**	13	0.81 $\pm$ 0.06	29.3 $\pm$ 3.9	76	4.75 $\pm$ 1.00	35.9 $\pm$ 2.4
99 - West of Western Sambo ER	1	0.06 $\pm$ 0.06	39.0 $\pm$ 0	34	2.13 $\pm$ 0.38	25.7 $\pm$ 3.0
98 - Middle Ground	16	1.00 $\pm$ 0.25	31.3 $\pm$ 5.5	75	4.69 $\pm$ 1.56	16.9 $\pm$ 0.8
97 - Middle Ground	5	0.31 $\pm$ 0.06	9.0 $\pm$ 2.3	52	3.25 $\pm$ 1.13	18.5 $\pm$ 2.1
Lower Florida Keys Total (9)	57	0.40 $\pm$ 0.12	22.6 $\pm$ 3.8	438	3.04 $\pm$ 0.70	26.9 $\pm$ 4.7
Mid-channel Patch Reef Total (24)	124	0.32 $\pm$ 0.08	26.1 $\pm$ 3.2	810	2.11 $\pm$ 0.40	37.7 $\pm$ 5.2
<i>Offshore patch reefs</i>						
Upper Florida Keys NMS						
12 - South of BNP boundary	2	0.13 $\pm$ 0.00	6.7 $\pm$ 1.0	15	0.94 $\pm$ 0.06	11.1 $\pm$ 2.4
41 - North of Carysfort Reef SPA	11	0.69 $\pm$ 0.06	20.4 $\pm$ 3.4	1	0.06 $\pm$ 0.06	14.0 $\pm$ 0
11 - North of Carysfort Reef SPA	3	0.19 $\pm$ 0.06	11.3 $\pm$ 8.8	13	0.81 $\pm$ 0.44	16.3 $\pm$ 4.2
14 - Carysfort Reef SPA**	1	0.06 $\pm$ 0.06	30.0 $\pm$ 0	0	0 $\pm$ 0	0 $\pm$ 0
13 - Carysfort Reef SPA**	3	0.19 $\pm$ 0.06	18.0 $\pm$ 3.6	1	0.06 $\pm$ 0.06	5.0 $\pm$ 0
10 - North of Dry Rocks SPA	22	1.38 $\pm$ 0.63	6.5 $\pm$ 0.9	0	0 $\pm$ 0	0 $\pm$ 0
9 - SW of Grecian Rocks SPA	6	0.38 $\pm$ 0.25	16.5 $\pm$ 4.3	9	0.56 $\pm$ 0.44	8.8 $\pm$ 1.4
8 - Inshore of French Reef SPA	1	0.06 $\pm$ 0.06	8.0 $\pm$ 0	8	0.50 $\pm$ 0.13	11.4 $\pm$ 2.4
7 - Inshore of Pickles Reef	31	1.94 $\pm$ 0.69	8.5 $\pm$ 1.0	4	0.25 $\pm$ 0.13	7.3 $\pm$ 1.3
Upper Florida Keys Total (9)	80	0.56 $\pm$ 0.22	14.0 $\pm$ 2.6	51	0.35 $\pm$ 0.12	10.5 $\pm$ 1.5
Middle Florida Keys NMS						
65 - North of Davis Reef SPA	15	0.94 $\pm$ 0.19	6.4 $\pm$ 1.8	13	0.81 $\pm$ 0.44	2.7 $\pm$ 0.6
64 - North of Davis Reef SPA	32	2.00 $\pm$ 1.25	10.1 $\pm$ 2.2	13	0.81 $\pm$ 0.44	8.4 $\pm$ 2.0
63 - North of Davis Reef SPA	80	05.0 $\pm$ 1.00	12.5 $\pm$ 1.0	12	0.75 $\pm$ 0.00	7.4 $\pm$ 1.1
62 - North of Davis Reef SPA	181	11.31 $\pm$ 0.06	9.0 $\pm$ 0.4	9	0.56 $\pm$ 0.06	8.0 $\pm$ 1.7
89 - Coffins Patch SPA**	10	0.63 $\pm$ 0.13	10.1 $\pm$ 2.1	9	0.56 $\pm$ 0.31	11.4 $\pm$ 2.1

Site number/site location	<i>Plexaurella</i> spp.			<i>Pseudoplexaura</i> spp.		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
88 - Coffins Patch SPA**	10	0.63 ± 0.25	18.5 ± 6.8	3	0.19 ± 0.06	17.0 ± 8.5
Middle Florida Keys Total (6)	328	3.42 ± 1.72	11.1 ± 1.7	59	0.61 ± 0.10	9.2 ± 1.9
Lower Florida Keys NMS						
109 - East of Looe Key RO	7	0.44 ± 0.19	28.1 ± 5.2	43	2.69 ± 0.19	40.0 ± 3.7
110 - Looe Key Research Only**	5	0.31 ± 0.06	33.0 ± 6.0	40	2.50 ± 1.13	47.5 ± 4.9
111 - Looe Key Research Only**	6	0.38 ± 0.25	28.2 ± 0	37	2.31 ± 0.19	29.9 ± 4.3
107 - North of Pelican Shoal	8	0.50 ± 0.00	7.9 ± 2.3	28	1.75 ± 0.25	18.1 ± 3.7
112 - Western Sambo ER**	4	0.25 ± 0.00	30.5 ± 8.0	26	1.63 ± 1.00	22.3 ± 2.8
113 - Western Sambo ER**	15	0.94 ± 0.44	25.5 ± 4.4	27	1.69 ± 1.06	27.6 ± 3.9
106 - NE of E. Dry Rocks SPA	7	0.44 ± 0.31	26.3 ± 5.2	59	3.69 ± 0.44	30.5 ± 2.9
133 - NE of E. Dry Rocks SPA	1	0.06 ± 0.06	48.0	20	1.25 ± 0.13	39.7 ± 6.6
Lower Florida Keys Total (8)	53	0.41 ± 0.09	28.4 ± 3.9	280	2.19 ± 0.28	32.0 ± 3.5
Offshore Patch Reef Total (23)	461	1.25 ± 0.51	18.3 ± 2.3	390	1.06 ± 0.21	18.3 ± 2.8
<i>Inner line reef tract spur & groove</i>						
Upper Florida Keys NMS						
32 - Turtle Rocks	11	0.69 ± 0.44	22.5 ± 6.3	57	3.56 ± 0.06	7.5 ± 0.6
31 - Inshore of Elbow Reef SPA	7	0.44 ± 0.31	21.9 ± 3.2	4	0.25 ± 0.25	6.5 ± 3.2
30 - North Dry Rocks	1	0.06 ± 0.06	27.0	1	0.06 ± 0.06	18.0
34 - Dry Rocks SPA**	1	0.06 ± 0.06	9.0	1	0.06 ± 0.06	3.0
33 - Dry Rocks SPA**	5	0.31 ± 0.06	11.6 ± 3.9	4	0.25 ± 0.25	5.8 ± 2.5
36 - Grecian Rocks SPA**	2	0.13 ± 0.00	15.0 ± 5.7	2	0.13 ± 0.00	11.5 ± 6.4
35 - Grecian Rocks SPA**	1	0.06 ± 0.06	13.0	2	0.13 ± 0.13	8.5 ± 4.5
Upper Florida Keys Total (7)	28	0.25 ± 0.09	17.1 ± 2.5	71	0.63 ± 0.49	8.7 ± 1.8
Inner Line Spur & Groove Total (7)	28	0.25 ± 0.09	17.1 ± 2.5	71	0.63 ± 0.49	8.7 ± 1.8
<i>High-relief spur & groove</i>						
Upper Florida Keys NMS						
23 - Carysfort Reef SPA**	1	0.06 ± 0.06	42.0	0	0 ± 0	0 ± 0
22 - Carysfort Reef SPA**	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
21 - Maitland grounding site	0	0 ± 0	0 ± 0	1	0.06 ± 0.06	11.0
24 - Elbow Reef SPA**	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
223 - Elbow Reef SPA**	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
19 - North of French Reef SPA	1	0.06 ± 0.06	1.0	1	0.06 ± 0.06	3.0
25 - French Reef SPA**	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
26 - French Reef SPA**	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
20 - Sand Island	1	0.06 ± 0.06	6.0	1	0.06 ± 0.06	3.0
18 - Sand Island	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
28 - Molasses Reef SPA**	0	0 ± 0	0 ± 0	1	0.06 ± 0.06	6.0
27 - Molasses Reef SPA**	0	0 ± 0	0 ± 0	1	0.06 ± 0.06	14.0
17 - Pickles Reef	2	0.13 ± 0.00	12.0 ± 10.0	6	0.38 ± 0.13	21.2 ± 8.5
16 - Pickles Reef	1	0.06 ± 0.06	4.0	0	0 ± 0	0 ± 0
15 - Pickles Reef	0	0 ± 0	0 ± 0	8	0.50 ± 0.25	4.5 ± 1.4
Upper Florida Keys Total (15)	6	0.03 ± 0.01	13.0 ± 7.5	19	0.08 ± 0.04	9.0 ± 2.6
Middle Florida Keys NMS						
67 - Delta Shoal	0	0 ± 0	0 ± 0	3	0.19 ± 0.06	14.0 ± 3.0
66 - Delta Shoal	2	0.13 ± 0.13	4.5 ± 1.5	22	1.38 ± 0.88	8.6 ± 1.0
69 - Sombrero Key SPA**	1	0.06 ± 0.06	5.0	4	0.25 ± 0.00	20.3 ± 3.6
266 - Sombrero Key SPA**	0	0 ± 0	0 ± 0	3	0.19 ± 0.19	12.3 ± 0.3
Middle Florida Keys Total (4)	3	0.05 ± 0.03	4.8 ± 0.3	32	0.50 ± 0.29	13.8 ± 2.4
Lower Florida Keys NMS						
124 - Looe Key SPA**	0	0 ± 0	0 ± 0	8	0.50 ± 0.38	25.3 ± 3.9
123 - Looe Key SPA**	0	0 ± 0	0 ± 0	9	0.56 ± 0.31	25.1 ± 8.5
120 - American Shoal	1	0.06 ± 0.06	5.0	3	0.19 ± 0.06	31.0 ± 15.8
122 - American Shoal	33	2.06 ± 0.81	17.1 ± 2.5	39	2.44 ± 0.94	7.5 ± 0.9
119 - Maryland Shoal	0	0 ± 0	0 ± 0	2	0.13 ± 0.00	16.5 ± 0.5
121 - Maryland Shoal	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
118 - Pelican Shoal	3	0.19 ± 0.19	9.0 ± 2.9	3	0.19 ± 0.19	18.0 ± 4.6
117 - Pelican Shoal	0	0 ± 0	0 ± 0	8	0.19 ± 0.06	26.3 ± 15.9

Site number/site location	<i>Plexaurella</i> spp.			<i>Pseudoplexaura</i> spp.		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
116 - No Name Reef	0	0 ± 0	0 ± 0	7	0.44 ± 0.06	12.9 ± 3.4
322 - Eastern Sambo RO**	0	0 ± 0	0 ± 0	2	0.13 ± 0.00	44.0 ± 20.0
125 - Eastern Sambo RO**	0	0 ± 0	0 ± 0	5	0.31 ± 0.31	11.8 ± 4.8
127 - Western Sambo ER**	0	0 ± 0	0 ± 0	2	0.13 ± 0.13	7.5 ± 2.5
126 - Western Sambo ER**	1	0.06 ± 0.06	44.0	5	0.31 ± 0.06	11.8 ± 5.3
115 - East of E. Dry Rocks SPA	0	0 ± 0	0 ± 0	3	0.19 ± 0.19	7.0 ± 3.1
129 - Eastern Dry Rocks SPA**	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
128 - Eastern Dry Rocks**	1	0.06 ± 0.06	13.0	7	0.44 ± 0.44	12.7 ± 3.8
327 - Rock Key SPA**	0	0 ± 0	0 ± 0	1	0.06 ± 0.06	8.0
130 - Rock Key SPA**	0	0 ± 0	0 ± 0	1	0.06 ± 0.06	5.0
131 - Sand Key SPA**	0	0 ± 0	0 ± 0	1	0.06 ± 0.06	26.0
328 - Sand Key SPA**	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
114 - Western Dry Rocks	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
Lower Florida Keys Total (21)	39	0.12 ± 0.10	17.6 ± 6.9	101	0.30 ± 0.11	17.4 ± 2.6
High-relief Spur & Groove Total (40)	48	0.08 ± 0.05	13.6 ± 4.2	152	0.24 ± 0.07	14.8 ± 1.8
<i>Fore-reef (6-15 m)</i>						
Upper Florida Keys NMS						
42 - South of BNP boundary	4	0.25 ± 0.00	24.5 ± 7.6	2	0.13 ± 0.13	6.5 ± 2.5
52 - Carysfort Reef SPA**	1	0.06 ± 0.06	3.0	0	0 ± 0	0 ± 0
51 - Carysfort Reef SPA**	4	0.25 ± 0.13	2.5 ± 0.6	0	0 ± 0	0 ± 0
50 - SW of Carysfort Reef SPA	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
40 - SW of Carysfort Reef SPA	17	1.06 ± 0.06	25.7 ± 4.0	1	0.06 ± 0.06	6.0 ± 0
39 - North of Elbow Reef SPA	4	0.25 ± 0.13	29.0 ± 0	3	0.19 ± 0.06	9.3 ± 1.2
245 - Elbow Reef SPA**	1	0.06 ± 0.06	57.0	0	0 ± 0	0 ± 0
46 - Elbow Reef SPA**	2	0.13 ± 0.00	5.5 ± 1.5	4	0.25 ± 0.13	4.0 ± 1.5
38 - SW of Elbow Reef SPA	22	1.38 ± 0.50	30.5 ± 4.2	0	0 ± 0	0 ± 0
49 - South of Elbow Reef SPA	0	0 ± 0	0 ± 0	4	0.25 ± 0.13	7.3 ± 1.0
37 - Dixie Shoal	4	0.25 ± 0.13	20.5 ± 8.6	3	0.19 ± 0.06	4.7 ± 1.5
48 - Dixie Shoal	10	0.63 ± 0.00	35.1 ± 6.1	3	0.19 ± 0.19	3.0 ± 1.0
47 - SW of Molasses Reef SPA	10	0.63 ± 0.38	19.2 ± 4.7	8	0.50 ± 0.00	4.4 ± 0.6
Upper Florida Keys Total (13)	79	0.38 ± 0.12	23.0 ± 4.8	28	0.13 ± 0.04	5.6 ± 0.7
Middle Florida Keys NMS						
81 - Conch Reef SPA**	10	0.63 ± 0.13	15.5 ± 4.6	3	0.19 ± 0.06	5.3 ± 0.7
80 - Conch Reef SPA**	9	0.56 ± 0.19	16.8 ± 4.3	2	0.13 ± 0.00	7.5 ± 1.5
82 - Conch Reef RO**	0	0 ± 0	0 ± 0	3	0.19 ± 0.19	5.0 ± 1.5
279 - Conch Reef RO**	4	0.25 ± 0.00	31.0 ± 6.2	1	0.06 ± 0.06	6.0
84 - Davis Reef SPA**	5	0.31 ± 0.06	34.6 ± 6.5	12	0.75 ± 0.13	4.8 ± 1.6
83 - Davis Reef SPA**	5	0.31 ± 0.06	25.8 ± 6.1	9	0.56 ± 0.06	3.6 ± 0.6
79 - SW of Crocker Reef	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
78 - SW of Crocker Reef	5	0.31 ± 0.06	25.8 ± 6.2	5	0.31 ± 0.19	4.6 ± 1.1
85 - Alligator Reef SPA**	17	1.06 ± 0.19	20.2 ± 5.2	14	0.88 ± 0.25	9.1 ± 1.0
68 - Alligator Reef SPA**	14	0.88 ± 0.38	42.1 ± 8.1	17	1.06 ± 0.06	7.9 ± 1.1
77 - SW of Alligator Reef SPA	6	0.38 ± 0.13	29.3 ± 5.7	0	0 ± 0	0 ± 0
87 - Tennessee Reef RO**	6	0.38 ± 0.13	23.3 ± 6.9	1	0.06 ± 0.06	1.0
86 - Tennessee Reef RO**	7	0.44 ± 0.06	31.4 ± 9.8	1	0.06 ± 0.06	4.0
76 - NE of Tennessee Light	7	0.44 ± 0.19	19.3 ± 7.5	1	0.06 ± 0.06	80.0
75 - East of Coffins Patch SPA	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
293 - Sombrero Key SPA**	3	0.19 ± 0.19	15.3 ± 5.4	6	0.38 ± 0.25	5.5 ± 1.0
96 - Sombrero Key SPA**	11	0.69 ± 0.44	12.0 ± 2.9	11	0.69 ± 0.31	8.5 ± 1.4
73 - West of Sombrero Key SPA	19	1.19 ± 0.06	26.5 ± 3.9	6	0.38 ± 0.13	8.8 ± 2.2
71 - South of Moser Channel	6	0.38 ± 0.13	9.8 ± 2.4	0	0 ± 0	0 ± 0
72 - South of Moser Channel	21	1.31 ± 0.44	12.5 ± 1.9	6	0.38 ± 0.25	5.3 ± 0.7
70 - South of Moser Channel	21	1.31 ± 0.19	17.4 ± 2.6	9	0.56 ± 0.31	8.4 ± 1.9
90 - South of Moser Channel	9	0.56 ± 0.31	37.4 ± 8.2	1	0.06 ± 0.06	5.0
Middle Florida Keys Total (22)	185	0.53 ± 0.09	23.5 ± 2.1	108	0.31 ± 0.07	10.0 ± 4.1
Lower Florida Keys NMS						
136 - South of Bahia Honda Key	3	0.19 ± 0.06	31.3 ± 10.2	9	0.56 ± 0.06	10.6 ± 4.9

Site number/site location	<i>Plexaurella</i> spp.			<i>Pseudoplexaura</i> spp.		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
138 - South of Bahia Honda Key	20	1.25 ± 0.50	39.5 ± 5.4	7	0.44 ± 0.19	13.3 ± 2.6
137 - South of Bahia Honda Key	5	0.31 ± 0.06	12.0 ± 4.6	9	0.56 ± 0.06	4.4 ± 0.5
135 - West of Looe Key SPA	4	0.25 ± 0.13	13.8 ± 4.2	6	0.38 ± 0.13	11.2 ± 4.0
134 - West of Pelican Shoal	22	1.38 ± 0.75	25.1 ± 4.3	41	2.56 ± 0.19	4.2 ± 0.3
139 - Eastern Sambo RO**	14	0.88 ± 0.38	18.9 ± 4.3	33	2.06 ± 0.31	6.0 ± 0.5
336 - Eastern Sambo RO**	3	0.19 ± 0.06	17.0 ± 4.9	7	0.44 ± 0.19	6.4 ± 1.1
141 - Western Sambo ER**	4	0.25 ± 0.25	34.5 ± 19.2	10	0.63 ± 0.25	6.2 ± 2.4
140 - Western Sambo ER**	3	0.19 ± 0.19	57.0 ± 5.0	3	0.19 ± 0.19	10.3 ± 2.0
143 - West of Western Sambo	3	0.19 ± 0.06	7.7 ± 0.9	24	1.50 ± 1.00	7.0 ± 1.9
132 - East of E. Dry Rocks SPA	2	0.13 ± 0.13	47.0 ± 18.0	2	0.13 ± 0.00	7.0 ± 3.0
346 - Rock Key SPA**	1	0.06 ± 0.06	11.0	6	0.38 ± 0.13	5.5 ± 1.0
149 - Rock Key SPA**	1	0.06 ± 0.06	2.0	7	0.44 ± 0.44	4.1 ± 0.6
347 - Sand Key SPA**	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
150 - Sand Key SPA**	6	0.38 ± 0.13	43.5 ± 9.6	7	0.44 ± 0.06	6.0 ± 0.5
142 - SW of Sand Key SPA	0	0 ± 0	0 ± 0	1	0.06 ± 0.06	11.0
Lower Florida Keys Total (16)	91	0.36 ± 0.11	25.7 ± 4.5	172	0.67 ± 0.18	7.6 ± 0.8
Fore-reef Total (51)	355	0.44 ± 0.06	24.1 ± 2.0	308	0.38 ± 0.07	8.3 ± 1.8

Table 12. Numbers of colonies (N), mean $\pm$ 1 SE colony densities (no. per m²), and mean $\pm$ 1 SE colony heights for *Pseudopterogorgia* and *Pterogorgia* gorgonians in the Florida Keys National Marine Sanctuary, as determined from surveys of two 8-m x 1-m transects per site at 145 locations during June-September 2008. Sites are arranged by habitat from northeast to southwest and asterisked locations (**) are Sanctuary Preservation Areas (SPA), Ecological Reserves (ER), or Research Only Areas (RO).

Site number/site location	<i>Pseudopterogorgia</i> spp.			<i>Pterogorgia</i> spp.		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
<i>Mid-channel patch reefs</i>						
Upper Florida Keys NMS						
6 - Basin Hill Shoals	1.9	5.19 $\pm$ 1.44	18.7 $\pm$ 1.9	1	0.06 $\pm$ 0.06	18.0
5 - Basin Hill Shoals	1.1	8.75 $\pm$ 0.50	19.7 $\pm$ 1.1	0	0 $\pm$ 0	0 $\pm$ 0
4 - Inshore of Grecian Rocks SPA	1.6	5.31 $\pm$ 1.44	22.5 $\pm$ 1.6	0	0 $\pm$ 0	0 $\pm$ 0
3 - South of Cannon Patch Reef	1.4	5.81 $\pm$ 2.56	17.8 $\pm$ 1.4	0	0 $\pm$ 0	0 $\pm$ 0
2 - Mosquito Bank	3.5	1.31 $\pm$ 1.31	22.4 $\pm$ 3.5	0	0 $\pm$ 0	0 $\pm$ 0
1 - Inshore of Molasses Reef	1.0	10.19 $\pm$ 7.06	16.1 $\pm$ 1.0	0	0 $\pm$ 0	0 $\pm$ 0
Upper Florida Keys Total (6)	585	6.09 $\pm$ 1.27	19.5 $\pm$ 1.0	1	0.01 $\pm$ 0.01	18.0
Middle Florida Keys NMS						
56 - Tavernier Rocks	3	0.19 $\pm$ 0.19	21.7 $\pm$ 9.4	1	0.06 $\pm$ 0.06	13.0
55 - Tavernier Rocks	2	0.13 $\pm$ 0.13	52.0 $\pm$ 37.0	0	0 $\pm$ 0	0 $\pm$ 0
59 - Hen and Chickens SPA**	18	1.13 $\pm$ 0.75	27.8 $\pm$ 3.6	0	0 $\pm$ 0	0 $\pm$ 0
58 - Hen and Chickens SPA**	30	1.88 $\pm$ 0.75	30.3 $\pm$ 2.6	0	0 $\pm$ 0	0 $\pm$ 0
61 - Cheeca Rocks SPA**	0	0 $\pm$ 0	0 $\pm$ 0	0	0 $\pm$ 0	0 $\pm$ 0
60 - Cheeca Rocks SPA**	1	0.06 $\pm$ 0.06	51.0	0	0 $\pm$ 0	0 $\pm$ 0
57 - NE of Cheeca Rocks SPA	2	0.13 $\pm$ 0.13	51.5 $\pm$ 1.5	0	0 $\pm$ 0	0 $\pm$ 0
54 - South of Duck Key	54	3.38 $\pm$ 0.13	31.7 $\pm$ 2.4	0	0 $\pm$ 0	0 $\pm$ 0
53 - South of Ohio Key	63	3.94 $\pm$ 0.31	32.2 $\pm$ 2.5	0	0 $\pm$ 0	0 $\pm$ 0
Middle Florida Keys Total (9)	173	1.20 $\pm$ 0.51	37.3 $\pm$ 4.3	1	0.01 $\pm$ 0.01	13.0
Lower Florida Keys NMS						
103 - North of Looe Key RO	9	0.56 $\pm$ 0.56	7.1 $\pm$ 1.5	3.0	0.06 $\pm$ 0.06	3.0
102 - North of Maryland Shoal	79	4.94 $\pm$ 0.56	35.6 $\pm$ 7.7		0 $\pm$ 0	0 $\pm$ 0
101 - North of Maryland Shoal	111	6.94 $\pm$ 1.69	15.1 $\pm$ 0.8	12.0	0.06 $\pm$ 0.06	12.0
100 - North of Eastern Sambo RO	191	11.94 $\pm$ 3.06	13.6 $\pm$ 0.8		0 $\pm$ 0	0 $\pm$ 0
105 - Western Sambo ER**	46	2.88 $\pm$ 0.75	38.5 $\pm$ 2.1		0 $\pm$ 0	0 $\pm$ 0
104 - Western Sambo ER**	57	3.56 $\pm$ 1.44	25.8 $\pm$ 1.9		0 $\pm$ 0	0 $\pm$ 0
99 - West of Western Sambo ER	22	1.38 $\pm$ 0.63	30.8 $\pm$ 4.0		0 $\pm$ 0	0 $\pm$ 0
98 - Middle Ground	107	6.69 $\pm$ 1.69	23.0 $\pm$ 1.4	10.0	0.06 $\pm$ 0.06	10.0
97 - Middle Ground	150	9.38 $\pm$ 3.63	22.5 $\pm$ 1.0		0 $\pm$ 0	0 $\pm$ 0
Lower Florida Keys Total (9)	772	5.36 $\pm$ 1.25	23.6 $\pm$ 3.5	3	0.02 $\pm$ 0.01	8.3 $\pm$ 2.4
Mid-channel Patch Reef Total (24)	1,530	3.98 $\pm$ 0.74	27.3 $\pm$ 2.6	5	0.01 $\pm$ 0.01	11.2 $\pm$ 2.4
<i>Offshore patch reefs</i>						
Upper Florida Keys NMS						
12 - South of BNP boundary	605	37.81 $\pm$ 9.31	13.1 $\pm$ 0.3	28	1.75 $\pm$ 0.88	10.4 $\pm$ 0.7
41 - North of Carysfort Reef SPA	79	4.94 $\pm$ 0.31	16.6 $\pm$ 1.2	0	0 $\pm$ 0	0 $\pm$ 0
11 - North of Carysfort Reef SPA	51	3.19 $\pm$ 0.06	25.7 $\pm$ 2.2	2	0.13 $\pm$ 0.13	10.5 $\pm$ 0.5
14 - Carysfort Reef SPA**	385	24.06 $\pm$ 4.06	13.9 $\pm$ 0.5	0	0 $\pm$ 0	0 $\pm$ 0
13 - Carysfort Reef SPA**	355	22.19 $\pm$ 7.81	13.3 $\pm$ 0.5	1	0.06 $\pm$ 0.06	4.0
10 - North of Dry Rocks SPA	53	3.31 $\pm$ 0.31	23.2 $\pm$ 2.0	25	1.56 $\pm$ 0.44	7.4 $\pm$ 0.6
9 - SW of Grecian Rocks SPA	53	3.31 $\pm$ 1.94	22.2 $\pm$ 2.3	4	0.25 $\pm$ 0.25	8.3 $\pm$ 2.1
8 - Inshore of French Reef SPA	108	6.75 $\pm$ 3.38	18.5 $\pm$ 1.4	6	0.38 $\pm$ 0.38	8.0 $\pm$ 1.0
7 - Inshore of Pickles Reef	67	4.19 $\pm$ 0.56	13.1 $\pm$ 1.1	3	0.19 $\pm$ 0.06	6.7 $\pm$ 1.2
Upper Florida Keys Total (9)	1,756	12.19 $\pm$ 4.22	17.7 $\pm$ 1.6	69	0.48 $\pm$ 0.23	7.9 $\pm$ 0.8
Middle Florida Keys NMS						
65 - North of Davis Reef SPA	182	11.38 $\pm$ 1.28	13.9 $\pm$ 0.8		0 $\pm$ 0	0 $\pm$ 0
64 - North of Davis Reef SPA	87	5.44 $\pm$ 1.31	16.5 $\pm$ 1.5	2.5	0.13 $\pm$ 0.13	17.5 $\pm$ 2.5
63 - North of Davis Reef SPA	85	5.31 $\pm$ 0.19	16.3 $\pm$ 1.3	1.7	0.25 $\pm$ 0.25	9.3 $\pm$ 1.7
62 - North of Davis Reef SPA	149	9.31 $\pm$ 0.44	17.4 $\pm$ 1.3	2.5	0.38 $\pm$ 0.00	9.0 $\pm$ 2.5
89 - Coffins Patch SPA**	55	3.44 $\pm$ 0.81	26.9 $\pm$ 2.3	0.5	0.13 $\pm$ 0.13	13.5 $\pm$ 0.5

Site number/site location	<i>Pseudopteroqorgia</i> spp.			<i>Pterogorgia</i> spp.		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
88 - Coffins Patch SPA**	120	7.50 ± 0.50	22.7 ± 1.4	1	0.06 ± 0.06	10.0
Middle Florida Keys Total (6)	678	7.06 ± 1.19	18.9 ± 2.0	15	0.16 ± 0.06	11.9 ± 1.6
Lower Florida Keys NMS						
109 - East of Looe Key RO	48	3.00 ± 0.25	28.3 ± 2.2	3	0.19 ± 0.19	16.7 ± 4.1
110 - Looe Key Research Only**	57	3.56 ± 0.44	30.4 ± 2.6	0	0 ± 0	0 ± 0
111 - Looe Key Research Only**	56	3.50 ± 2.38	26.5 ± 2.3	0	0 ± 0	0 ± 0
107 - North of Pelican Shoal	86	5.38 ± 2.00	15.9 ± 1.3	11	0.69 ± 0.69	13.2 ± 2.4
112 - Western Sambo ER**	41	2.56 ± 0.81	28.7 ± 2.6	0	0 ± 0	0 ± 0
113 - Western Sambo ER**	48	3.00 ± 0.75	27.2 ± 2.5	0	0 ± 0	0 ± 0
106 - NE of E. Dry Rocks SPA	60	3.75 ± 1.50	27.8 ± 2.0	0	0 ± 0	0 ± 0
133 - NE of E. Dry Rocks SPA	23	1.44 ± 0.31	30.3 ± 2.5	0	0 ± 0	0 ± 0
Lower Florida Keys Total (8)	419	3.27 ± 0.40	26.9 ± 1.6	14	0.11 ± 0.09	14.9 ± 1.7
Offshore Patch Reef Total (23)	2,853	7.75 ± 1.82	21.2 ± 1.3	98	0.27 ± 0.10	10.3 ± 1.0
<i>Inner line reef tract spur & groove</i>						
Upper Florida Keys NMS						
32 - Turtle Rocks	91	5.69 ± 0.06	11.3 ± 0.9	0	0 ± 0	0 ± 0
31 - Inshore of Elbow Reef SPA	197	12.31 ± 2.31	16.8 ± 1.0	0	0 ± 0	0 ± 0
30 - North Dry Rocks	148	9.25 ± 6.63	21.2 ± 1.3	5	0.31 ± 0.31	6.6 ± 1.2
34 - Dry Rocks SPA**	92	5.75 ± 3.00	13.3 ± 0.9	0	0 ± 0	0 ± 0
33 - Dry Rocks SPA**	163	10.19 ± 3.19	11.5 ± 0.7	0	0 ± 0	0 ± 0
36 - Grecian Rocks SPA**	123	7.69 ± 1.69	15.2 ± 12.5	0	0 ± 0	0 ± 0
35 - Grecian Rocks SPA**	42	2.63 ± 0.75	16.8 ± 2.2	1	0.06 ± 0.06	11.0
Upper Florida Keys Total (7)	856	7.64 ± 1.23	15.2 ± 1.3	6	0.05 ± 0.04	8.8 ± 2.2
Inner Line Spur & Groove Total (7)	856	7.64 ± 1.23	15.2 ± 1.3	6	0.05 ± 0.04	8.8 ± 2.2
<i>High-relief spur & groove</i>						
Upper Florida Keys NMS						
23 - Carysfort Reef SPA**	335	20.94 ± 7.56	13.7 ± 0.5	0	0 ± 0	0 ± 0
22 - Carysfort Reef SPA**	267	16.69 ± 4.81	11.7 ± 0.5	0	0 ± 0	0 ± 0
21 - Maitland grounding site	118	7.38 ± 6.00	16.2 ± 1.0	11	0.69 ± 0.44	6.0 ± 0.7
24 - Elbow Reef SPA**	149	9.31 ± 5.94	12.3 ± 0.7	0	0 ± 0	0 ± 0
223 - Elbow Reef SPA**	152	9.50 ± 5.13	15.1 ± 0.8	0	0 ± 0	0 ± 0
19 - North of French Reef SPA	53	3.31 ± 0.69	13.0 ± 1.3	89	5.56 ± 2.19	6.7 ± 0.3
25 - French Reef SPA**	19	1.19 ± 0.31	16.5 ± 2.9	0	0 ± 0	0 ± 0
26 - French Reef SPA**	138	8.63 ± 8.25	13.1 ± 0.9	0	0 ± 0	0 ± 0
20 - Sand Island	77	4.81 ± 2.31	18.4 ± 1.4	15	0.94 ± 0.94	6.2 ± 1.3
18 - Sand Island	138	8.63 ± 1.00	19.7 ± 1.1	0	0 ± 0	0 ± 0
28 - Molasses Reef SPA**	75	4.69 ± 2.44	11.6 ± 0.9	0	0 ± 0	0 ± 0
27 - Molasses Reef SPA**	262	16.38 ± 1.88	12.8 ± 0.6	3	0.19 ± 0.19	5.0 ± 1.2
17 - Pickles Reef	51	3.19 ± 1.56	18.3 ± 2.1	59	3.69 ± 3.19	6.4 ± 0.4
16 - Pickles Reef	4	0.25 ± 0.25	18.0 ± 8.3	3	0.19 ± 0.19	4.0 ± 0.6
15 - Pickles Reef	139	8.69 ± 1.81	16.8 ± 1.0	22	1.38 ± 0.00	7.7 ± 0.8
Upper Florida Keys Total (15)	1,977	8.24 ± 1.53	15.1 ± 0.7	202	0.84 ± 0.42	6.0 ± 0.5
Middle Florida Keys NMS						
67 - Delta Shoal	19	1.19 ± 0.06	16.6 ± 2.2	0	0 ± 0	0 ± 0
66 - Delta Shoal	110	6.88 ± 3.25	19.3 ± 1.4	1.44	1.44 ± 1.44	9.7 ± 1.0
69 - Sombrero Key SPA**	15	0.94 ± 0.31	25.5 ± 4.3	0	0 ± 0	0 ± 0
266 - Sombrero Key SPA**	17	1.06 ± 0.56	18.2 ± 2.1	0	0 ± 0	0 ± 0
Middle Florida Keys Total (4)	161	2.52 ± 1.45	19.9 ± 1.9	23	0.36 ± 0.36	9.7
Lower Florida Keys NMS						
124 - Looe Key SPA**	51	3.19 ± 0.44	15.2 ± 1.6	0	0 ± 0	0 ± 0
123 - Looe Key SPA**	77	4.81 ± 0.06	14.3 ± 1.3	0	0 ± 0	0 ± 0
120 - American Shoal	21	1.31 ± 1.06	18.9 ± 2.6	0	0 ± 0	0 ± 0
122 - American Shoal	145	9.06 ± 1.94	14.0 ± 0.8	0.81	0.81 ± 0.19	8.5 ± 1.3
119 - Maryland Shoal	0	0 ± 0	0 ± 0	0	0 ± 0	0 ± 0
121 - Maryland Shoal	2	0.13 ± 0.13	19.0 ± 10.0	0	0 ± 0	0 ± 0
118 - Pelican Shoal	12	0.75 ± 0.75	19.3 ± 2.5	0.06	0.06 ± 0.06	5.0
117 - Pelican Shoal	25	1.56 ± 0.44	15.5 ± 1.4	0	0 ± 0	0 ± 0

Site number/site location	<i>Pseudopteroqorgia</i> spp.			<i>Pterogorgia</i> spp.		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
116 - No Name Reef	34	2.13 ± 1.75	19.3 ± 1.9	0	0 ± 0	0 ± 0
322 - Eastern Sambo RO**	51	3.19 ± 2.19	19.5 ± 1.7	0	0 ± 0	0 ± 0
125 - Eastern Sambo RO**	46	2.88 ± 0.38	18.2 ± 1.9	14	0.88 ± 0.88	8.8 ± 0.9
127 - Western Sambo ER**	95	5.94 ± 1.94	12.7 ± 0.9	2	0.13 ± 0.13	9.5 ± 5.5
126 - Western Sambo ER**	60	3.75 ± 0.50	16.0 ± 1.3	0	0 ± 0	0 ± 0
115 - East of E. Dry Rocks SPA	33	2.06 ± 0.19	22.9 ± 2.9	0	0 ± 0	0 ± 0
129 - Eastern Dry Rocks SPA**	9	0.56 ± 0.44	17.2 ± 3.6	0	0 ± 0	0 ± 0
128 - Eastern Dry Rocks**	7	0.44 ± 0.06	11.9 ± 1.3	0	0 ± 0	0 ± 0
327 - Rock Key SPA**	43	2.69 ± 0.69	18.0 ± 1.7	0	0 ± 0	0 ± 0
130 - Rock Key SPA**	22	1.38 ± 1.38	13.6 ± 0.9	13	0.81 ± 0.81	7.0 ± 0.8
131 - Sand Key SPA**	35	2.19 ± 0.06	16.3 ± 1.8	0	0 ± 0	0 ± 0
328 - Sand Key SPA**	13	0.81 ± 0.56	16.9 ± 2.0	0	0 ± 0	0 ± 0
114 - Western Dry Rocks	57	3.56 ± 1.06	13.5 ± 0.7	0	0 ± 0	0 ± 0
Lower Florida Keys Total (21)	838	2.49 ± 0.47	16.6 ± 0.6	43	0.13 ± 0.06	7.7 ± 0.8
High-relief Spur & Groove Total (40)	2,976	4.65 ± 0.77	16.4 ± 0.5	268	0.42 ± 0.17	7.0 ± 0.5
<i>Fore-reef (6-15 m)</i>						
Upper Florida Keys NMS						
42 - South of BNP boundary	91	5.69 ± 0.06	18.8 ± 1.3	27	1.69 ± 1.19	8.9 ± 0.7
52 - Carysfort Reef SPA**	188	11.75 ± 3.00	13.4 ± 0.6	2	0.13 ± 0.00	5.0 ± 0.0
51 - Carysfort Reef SPA**	169	10.56 ± 1.31	15.1 ± 0.7	1	0.06 ± 0.06	4.0
50 - SW of Carysfort Reef SPA	100	6.25 ± 1.00	22.8 ± 1.3	0	0 ± 0	0 ± 0
40 - SW of Carysfort Reef SPA	79	4.94 ± 1.44	18.5 ± 1.2	0	0 ± 0	0 ± 0
39 - North of Elbow Reef SPA	132	8.25 ± 0.25	13.1 ± 0.7	45	2.81 ± 0.81	6.9 ± 0.4
245 - Elbow Reef SPA**	204	12.75 ± 2.25	10.0 ± 0.6	4	0.25 ± 0.13	8.3 ± 1.8
46 - Elbow Reef SPA**	296	18.50 ± 4.88	11.1 ± 0.5	5	0.31 ± 0.31	5.8 ± 0.9
38 - SW of Elbow Reef SPA	43	2.69 ± 0.19	18.8 ± 2.0	11	0.69 ± 0.19	42.1 ± 4.9
49 - South of Elbow Reef SPA	140	8.75 ± 4.38	11.7 ± 0.7	0	0 ± 0	0 ± 0
37 - Dixie Shoal	171	10.69 ± 3.06	13.7 ± 0.7	0	0 ± 0	0 ± 0
48 - Dixie Shoal	256	16.00 ± 0.63	11.5 ± 0.5	1	0.06 ± 0.06	9.0
47 - SW of Molasses Reef SPA	243	15.19 ± 3.69	12.3 ± 0.6	0	0 ± 0	0 ± 0
Upper Florida Keys Total (13)	2,112	10.15 ± 1.30	14.7 ± 1.1	96	0.46 ± 0.24	11.2 ± 4.5
Middle Florida Keys NMS						
81 - Conch Reef SPA**	66	4.13 ± 0.38	17.4 ± 1.6	0	0 ± 0	0 ± 0
80 - Conch Reef SPA**	38	2.38 ± 1.38	18.8 ± 2.1	27	1.69 ± 0.31	13.6 ± 3.6
82 - Conch Reef RO**	192	12.00 ± 3.13	15.0 ± 1.0	0	0 ± 0	0 ± 0
279 - Conch Reef RO**	152	9.50 ± 0.88	15.5 ± 0.9	11	0.69 ± 0.44	6.5 ± 0.5
84 - Davis Reef SPA**	135	8.44 ± 0.06	14.6 ± 1.1	0	0 ± 0	0 ± 0
83 - Davis Reef SPA**	150	9.38 ± 2.25	16.5 ± 1.5	0	0 ± 0	0 ± 0
79 - SW of Crocker Reef	93	5.81 ± 1.19	19.2 ± 1.4	0	0 ± 0	0 ± 0
78 - SW of Crocker Reef	166	10.38 ± 0.63	15.4 ± 0.9	2	0.13 ± 0.13	5.5 ± 2.5
85 - Alligator Reef SPA**	157	9.81 ± 1.56	17.6 ± 1.0	11	0.69 ± 0.19	9.7 ± 2.9
68 - Alligator Reef SPA**	202	12.63 ± 1.25	15.9 ± 0.6	0	0 ± 0	0 ± 0
77 - SW of Alligator Reef SPA	148	9.25 ± 1.50	18.1 ± 1.0	0	0 ± 0	0 ± 0
87 - Tennessee Reef RO**	75	4.69 ± 0.44	24.6 ± 2.1	1	0.06 ± 0.06	7.0
86 - Tennessee Reef RO**	81	5.06 ± 0.19	19.5 ± 1.8	0	0 ± 0	0 ± 0
76 - NE of Tennessee Light	120	7.50 ± 1.63	25.1 ± 1.5	0	0 ± 0	0 ± 0
75 - East of Coffins Patch SPA	96	6.00 ± 1.63	30.3 ± 1.3	0	0 ± 0	0 ± 0
293 - Sombrero Key SPA**	164	10.25 ± 0.00	19.9 ± 0.9	0	0 ± 0	0 ± 0
96 - Sombrero Key SPA**	188	11.75 ± 1.13	15.5 ± 1.1	2	0.13 ± 0.13	10.0 ± 1.0
73 - West of Sombrero Key SPA	195	12.19 ± 1.69	17.0 ± 1.0	0	0 ± 0	0 ± 0
71 - South of Moser Channel	151	9.44 ± 3.94	11.9 ± 0.7	0	0 ± 0	0 ± 0
72 - South of Moser Channel	158	9.88 ± 0.25	16.1 ± 1.0	0	0 ± 0	0 ± 0
70 - South of Moser Channel	158	9.88 ± 3.63	12.9 ± 0.8	0	0 ± 0	0 ± 0
90 - South of Moser Channel	86	5.38 ± 0.63	12.5 ± 1.3	0	0 ± 0	0 ± 0
Middle Florida Keys Total (22)	2,971	8.44 ± 0.62	17.7 ± 0.9	54	0.15 ± 0.08	8.7 ± 1.2
Lower Florida Keys NMS						
136 - South of Bahia Honda Key	128	8.00 ± 2.50	12.6 ± 1.1	0	0 ± 0	0 ± 0

Site number/site location	<i>Pseudopteroqorgia</i> spp.			<i>Pterogorgia</i> spp.		
	N	No./m ²	Height (cm)	N	No./m ²	Height (cm)
138 - South of Bahia Honda Key	111	6.94 ± 1.31	20.4 ± 1.4	0	0 ± 0	0 ± 0
137 - South of Bahia Honda Key	170	10.63 ± 0.25	17.4 ± 0.9	0	0 ± 0	0 ± 0
135 - West of Looe Key SPA	69	4.31 ± 0.19	19.8 ± 1.5	0	0 ± 0	0 ± 0
134 - West of Pelican Shoal	320	20.00 ± 3.50	10.5 ± 0.4	18	1.13 ± 1.13	11.2 ± 1.5
139 - Eastern Sambo RO**	247	15.44 ± 0.56	12.7 ± 0.6	0	0 ± 0	0 ± 0
336 - Eastern Sambo RO**	174	10.88 ± 1.50	14.3 ± 0.8	0	0 ± 0	0 ± 0
141 - Western Sambo ER**	220	13.75 ± 2.00	12.5 ± 0.6	1	0.06 ± 0.06	5.0
140 - Western Sambo ER**	89	5.56 ± 5.56	16.7 ± 0.8	0	0 ± 0	0 ± 0
143 - West of Western Sambo	227	14.19 ± 3.19	9.8 ± 0.4	14	0.88 ± 0.25	11.1 ± 1.3
132 - East of E. Dry Rocks SPA	102	6.38 ± 0.25	14.0 ± 1.0	0	0 ± 0	0 ± 0
346 - Rock Key SPA**	293	18.31 ± 4.69	16.5 ± 0.7	0	0 ± 0	0 ± 0
149 - Rock Key SPA**	164	10.25 ± 1.75	14.4 ± 0.7	0	0 ± 0	0 ± 0
347 - Sand Key SPA**	246	15.38 ± 3.50	15.8 ± 0.7	0	0 ± 0	0 ± 0
150 - Sand Key SPA**	152	9.50 ± 1.25	15.5 ± 0.9	0	0 ± 0	0 ± 0
142 - SW of Sand Key SPA	83	5.19 ± 1.56	24.3 ± 1.6	2	0.13 ± 0.13	9.5 ± 0.5
Lower Florida Keys Total (16)	2,795	10.92 ± 1.21	15.4 ± 0.9	35	0.14 ± 0.09	9.2 ± 1.5
Fore-reef Total (51)	7,878	9.65 ± 0.58	16.2 ± 0.6	185	0.23 ± 0.08	10.0 ± 2.0