

Table 19. Stony coral (Milleporina and Scleractinia) species richness in the Florida Keys National Marine Sanctuary and Biscayne National Park, as determined from four 15-m x 1-m belt transects at 235 sites during June-August 2007. Values are the mean $\pm$ 1 SE number of species per transect (15-m x 1-m) and total species per site (60 m²). 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	No. species per transect		No. species per site		
	Mean	SE	Total	Mean	SE
<i>Mid-channel patch reefs</i>					
Biscayne National Park					
445 - Northern Legare Anchorage	16.3	0.6	23		
441 - Bache Shoal	12.3	0.5	18		
440 - South of Bache Shoal	9.3	1.3	17		
438 - South of Bache Shoal	10.5	0.3	17		
437 - South of Legare Anchorage	12.3	0.9	19		
427 - Margot Fish Shoal	11.8	1.0	19		
421 - Margot Fish Shoal	11.5	0.9	20		
419 - Inshore of Ajax Reef	15.0	0.0	21		
413 - Inshore of Pacific Reef	12.5	0.3	19		
410 - Inshore of Pacific Reef	11.8	1.3	18		
408 - Offshore of Broad Creek	14.0	0.7	21		
406 - Offshore of Broad Creek	17.5	1.2	28		
Biscayne National Park Total (12)	12.9	0.7	35	20.0	0.9
Upper Florida Keys NMS					
4 - Basin Hill Shoals	13.5	1.0	18		
2 - Near Cannon Patch Reef	13.3	0.6	19		
3 - Near Cannon Patch Reef	9.5	0.9	13		
1 - Inshore of Molasses Reef	16.8	0.9	26		
Upper Florida Keys Total (4)	13.3	1.5	30	19.0	2.7
Middle Florida Keys NMS					
69 - Tavernier Rocks	7.3	1.1	13		
71 - Hen and Chickens SPA**	9.8	0.3	15		
70 - Hen and Chickens SPA**	9.8	1.1	15		
68 - East of Cheeca Rocks SPA	10.3	1.3	17		
72 - Cheeca Rocks SPA**	8.8	0.8	14		
73 - Cheeca Rocks SPA**	14.8	0.5	21		
66 - East Turtle Shoal	15.3	0.8	23		
254 - East Turtle Shoal	15.3	0.5	23		
Middle Florida Keys Total (8)	11.4	1.1	27	17.6	1.5
Lower Florida Keys NMS					
122 - North of Big Pine Shoal	14.0	1.2	19		
121 - North of Maryland Shoal	17.5	1.3	25		
120 - North of Maryland Shoal	13.8	1.3	23		
119 - North of Pelican Shoal	17.8	0.9	26		
118 - East of Western Sambo ER	14.5	1.0	21		
126 - Western Sambo ER**	16.8	0.9	25		
125 - Western Sambo ER**	15.5	0.7	25		
124 - Western Sambo ER**	15.5	1.4	21		
123 - Western Sambo ER**	11.8	0.5	18		
117 - NW of Sand Key SPA	11.0	0.7	15		
116 - North of Satan Shoal	13.8	0.3	21		
115 - North of Satan Shoal	10.5	0.3	15		
Lower Florida Keys Total (12)	14.4	0.7	34	21.2	1.1
Mid-channel Patch Reef Total (36)	13.1	0.5	38	19.8	0.7
<i>Offshore patch reefs</i>					
Biscayne National Park					

Site number/site location	No. species per transect		No. species per site		
	Mean	SE	Total	Mean	SE
471 - Northwest of Triumph Reef	11.0	0.4	16		
461 - NW of Long Reef	10.5	0.3	15		
460 - NW of Long Reef	14.5	0.7	21		
459 - NW of Pacific Reef	12.5	0.3	19		
458 - Inshore of Pacific Reef	8.0	0.9	14		
456 - Inshore of Pacific Reef	17.5	1.0	25		
454 - Northwest of Whistle Buoy	16.3	1.4	23		
Biscayne National Park Total (7)	12.9	1.3	35	19.0	1.6
Upper Florida Keys NMS					
16 - North of Carysfort Reef SPA	13.3	0.5	22		
15 - North of Carysfort Reef SPA	8.3	0.6	12		
14 - North of Carysfort Reef SPA	12.3	0.5	18		
47 - Carysfort Reef SPA**	11.0	0.7	20		
345 - Carysfort Reef SPA**	10.8	0.8	16		
46 - Carysfort Reef SPA**	10.3	1.0	15		
39 - Carysfort Reef SPA**	11.0	0.4	17		
37 - West of Carysfort Reef SPA	6.5	0.7	11		
13 - Inshore of Watson's Reef	7.0	0.7	12		
55 - Inshore of Watson's Reef	13.8	1.0	19		
358 - Inshore of Watson's Reef	18.0	1.4	29		
54 - Inshore of Watson's Reef	14.3	0.9	22		
347 - Inshore of Watson's Reef	11.8	0.8	19		
12 - Inshore of Watson's Reef	14.8	1.0	21		
9 - White Banks	11.5	1.0	19		
8 - Inshore of French Reef	9.0	0.7	12		
7 - Inshore of Molasses Reef	12.3	0.5	18		
6 - Inshore of Molasses Reef	12.8	1.2	22		
5 - Inshore of Pickles Reef	14.8	1.5	22		
Upper Florida Keys Total (19)	11.7	0.7	38	18.2	1.0
Middle Florida Keys NMS					
77 - Inshore of Conch Reef SPA	13.3	0.8	19		
76 - Inshore of Conch Reef SPA	13.0	1.6	18		
75 - Inshore of Conch Reef SPA	11.3	1.3	17		
74 - Inshore of Conch Reef SPA	11.3	0.6	18		
98 - Coffins Patch SPA**	12.3	0.9	20		
277 - Coffins Patch SPA**	10.5	1.0	15		
Middle Florida Keys Total (6)	11.9	0.5	23	17.8	0.7
Lower Florida Keys NMS					
133 - Looe Key Research Only**	10.5	0.9	17		
132 - Looe Key Research Only**	15.8	1.5	25		
131 - North of Looe Key SPA**	15.3	0.8	21		
130 - Maryland Shoal	16.0	0.4	23		
129 - North of Maryland Shoal	13.5	1.7	21		
165 - North of Maryland Shoal	16.5	0.7	26		
128 - NE of Eastern Sambo RO	13.3	0.8	20		
135 - Western Sambo ER**	17.0	1.4	26		
168 - Western Sambo ER**	19.3	0.6	26		
127 - West of Sand Key SPA	17.5	1.6	26		
Lower Florida Keys Total (10)	15.5	0.8	32	23.1	1.0
Offshore Patch Reef Total (42)	12.8	0.5	42	19.5	0.7
<i>Hard-bottom/rubble/sand matrix</i>					
Upper Florida Keys NMS					
40 - Carysfort Reef SPA**	9.5	0.3	14		
38 - West of Carysfort Reef SPA	10.8	0.8	16		
36 - West of Carysfort Reef SPA	8.3	0.9	12		
11 - NW of Dry Rocks SPA	5.5	0.5	10		

Site number/site location	No. species per transect		No. species per site		
	Mean	SE	Total	Mean	SE
Upper Florida Keys Total (4)	8.5	1.1	21	13.0	1.3
Hard-bottom Matrix Total (4)	8.5	1.1	21	13.0	1.3
<i>Low-relief hard-bottom (< 6 m)</i>					
Biscayne National Park					
475 - Fowey Rocks	7.8	0.6	12		
469 - South of Ajax Reef	7.3	0.8	11		
Biscayne National Park Total (2)	7.5	0.3	14	11.5	0.5
Upper Florida Keys NMS					
346 - Carysfort Reef SPA**	12.0	1.0	18		
35 - West of Carysfort Reef SPA	7.5	0.5	11		
34 - West of Carysfort Reef SPA	7.3	0.5	11		
33 - Inshore of Watson's Reef	7.3	0.5	10		
17 - Little Pickles Reef	7.0	0.4	11		
Upper Florida Keys Total (5)	8.2	1.0	21	12.2	1.5
Middle Florida Keys NMS					
269 - Conch Reef SPA**	8.5	0.7	14		
89 - Conch Reef SPA**	7.0	1.1	12		
88 - Little Conch Reef	7.5	0.5	13		
352 - Little Conch Reef	8.5	0.9	13		
97 - Davis Reef SPA**	8.8	0.3	14		
90 - Davis Reef SPA**	10.3	0.8	14		
86 - South of Windley Key	9.0	0.4	14		
103 - NE of Alligator Light	11.3	1.0	18		
82 - Alligator Reef SPA**	9.5	0.9	13		
81 - Alligator Reef SPA**	7.8	1.1	15		
350 - Tennessee Light	5.3	0.8	9		
85 - East of Coffins Patch SPA	9.5	0.3	13		
92 - Coffins Patch SPA**	8.0	0.7	12		
91 - Coffins Patch SPA**	9.0	1.1	13		
Middle Florida Keys Total (14)	8.6	0.4	28	13.4	0.5
Lower Florida Keys NMS					
161 - West of American Shoal	3.0	1.8	8		
140 - Maryland Shoal	7.0	0.9	13		
159 - North of Pelican Shoal	8.5	0.9	13		
158 - East of No Name Reef	8.3	1.0	14		
Lower Florida Keys Total (4)	6.7	1.3	17	12.0	1.4
Hard-bottom (< 6 m) Total (25)	8.1	0.4	28	12.8	0.5
<i>Inner line reef tract spur & groove</i>					
Upper Florida Keys NMS					
61 - Turtle Reef	11.8	0.8	18		
60 - Inshore of Elbow Reef SPA	8.5	0.5	14		
59 - Inshore of Elbow Reef SPA	9.8	0.9	16		
58 - Horseshoe Reef	8.0	1.5	14		
62 - Dry Rocks SPA**	4.8	0.3	8		
63 - Dry Rocks SPA**	5.0	0.7	10		
65 - Grecian Rocks SPA**	4.0	0.7	7		
64 - Grecian Rocks SPA**	5.0	0.9	12		
Upper Florida Keys Total (8)	7.1	1.0	26	12.4	1.4
Inner Line Spur & Groove Total (8)	7.1	1.0	26	12.4	1.4
<i>High-relief spur & groove</i>					
Biscayne National Park					
474 - Brewster Reef	10.3	0.5	15		
472 - Star Reef	6.0	0.7	11		
470 - Triumph Reef	8.5	1.0	12		

Site number/site location	No. species per transect		No. species per site		
	Mean	SE	Total	Mean	SE
467 - Long Reef	7.3	0.5	12		
466 - Ajax Reef	6.3	0.8	10		
465 - Ajax Reef	7.5	1.9	13		
464 - Pacific Reef	7.5	0.7	10		
Biscayne National Park Total (7)	7.6	0.5	20	11.9	0.7
Upper Florida Keys NMS					
26 - Carysfort Reef SPA**	7.8	0.8	12		
25 - Carysfort Reef SPA**	5.3	0.9	9		
218 - South Carysfort Reef SPA**	4.3	0.3	8		
217 - South Carysfort Reef SPA**	5.0	0.7	8		
24 - Maitland Grounding Site	5.5	0.3	9		
28 - Elbow Reef SPA**	7.0	0.4	9		
27 - Elbow Reef SPA**	6.8	0.8	10		
30 - French Reef SPA**	10.3	1.0	20		
29 - French Reef SPA**	10.8	1.2	18		
23 - SW of French Reef SPA	8.3	0.9	14		
357 - Sand Island	6.8	0.6	12		
356 - Sand Island	8.5	1.3	15		
32 - Molasses Reef SPA**	6.8	0.8	11		
31 - Molasses Reef SPA**	7.8	0.5	14		
19 - Pickles Reef	8.0	0.7	15		
20 - Pickles Reef	6.8	0.3	11		
18 - Pickles Reef	8.0	0.4	13		
Upper Florida Keys Total (17)	7.3	0.4	31	12.2	0.8
Middle Florida Keys NMS					
79 - Delta Shoal	9.0	1.4	14		
78 - Delta Shoal	8.8	1.4	14		
84 - Sombrero Key SPA**	9.8	1.1	17		
83 - Sombrero Key SPA**	9.3	0.5	16		
Middle Florida Keys Total (4)	9.2	0.2	23	15.3	0.8
Lower Florida Keys NMS					
148 - Looe Key SPA**	3.0	1.9	8		
147 - Looe Key SPA**	4.8	2.8	12		
145 - American Shoal	3.3	1.9	9		
146 - American Shoal	4.8	2.8	10		
144 - Maryland Shoal	4.8	0.5	7		
141 - Maryland Shoal	11.3	1.6	16		
143 - Maryland Shoal	11.5	0.5	17		
139 - Pelican Shoal	8.5	0.7	14		
138 - No Name Reef	8.0	1.2	13		
137 - No Name Reef	11.0	0.8	21		
150 - Eastern Sambo RO**	6.0	1.1	10		
149 - Eastern Sambo RO**	6.5	0.9	11		
348 - Middle Sambo Reef	6.8	0.5	10		
309 - Middle Sambo Reef	7.8	0.5	12		
152 - Western Sambo ER**	6.5	1.2	13		
151 - Western Sambo ER**	4.8	1.0	9		
136 - East of Eastern Dry Rocks SPA	7.5	0.5	15		
154 - Eastern Dry Rocks SPA**	8.0	1.2	15		
153 - Eastern Dry Rocks SPA**	5.0	0.6	9		
156 - Rock Key SPA**	6.5	0.7	13		
155 - Rock Key SPA**	5.0	0.4	9		
325 - Sand Key SPA**	5.3	0.6	9		
157 - Sand Key SPA**	6.5	1.3	11		
Lower Florida Keys Total (23)	6.6	0.5	31	11.9	0.7
High-relief Spur & Groove Total (51)	7.2	0.3	34	12.3	0.4

Site number/site location	No. species per transect		No. species per site		
	Mean	SE	Total	Mean	SE
<i>Low-relief hard-bottom (6-15 m)</i>					
Upper Florida Keys NMS					
53 - Carysfort Reef SPA**	7.0	0.4	10		
240 - Carysfort Reef SPA**	9.5	0.3	14		
57 - Inshore of Watson's Reef	7.8	1.7	14		
45 - Offshore of Dry Rocks SPA	8.0	0.6	12		
22 - SW of French Reef SPA	10.8	0.3	16		
21 - SW of French Reef SPA	14.3	0.5	20		
Upper Florida Keys Total (6)	9.5	1.1	24	14.3	1.4
Middle Florida Keys NMS					
353 - Conch Reef SPA**	11.3	1.3	17		
105 - Conch Reef SPA**	9.3	0.3	16		
104 - NE of Alligator Light	4.0	0.7	7		
351 - South of Indian Key	9.3	0.3	14		
101 - South of Lower Matecumbe	11.0	0.4	17		
111 - West of Sombrero Key	12.3	0.6	17		
Middle Florida Keys Total (6)	9.5	1.2	26	14.7	1.6
Lower Florida Keys NMS					
180 - South of Bahia Honda Key	7.3	0.5	11		
173 - Maryland Shoal	9.0	0.4	14		
177 - NE of Satan Shoal	9.3	0.6	14		
Lower Florida Keys Total (3)	8.2	0.5	18	13.0	1.0
Hard-bottom (6-15 m) Total (15)	9.3	0.6	30	14.2	0.8
<i>Patchy hard-bottom (6-15 m)</i>					
Upper Florida Keys NMS					
56 - Inshore of Watson's Reef	8.0	1.0	13		
44 - Dixie Shoal	8.0	0.7	13		
43 - Dixie Shoal	9.8	1.0	15		
42 - Dixie Shoal	10.3	0.6	13		
Upper Florida Keys Total (4)	9.0	0.6	19	13.5	0.5
Middle Florida Keys NMS					
96 - South of Windley Key	9.8	0.6	14		
114 - South of Lower Matecumbe	4.5	0.7	8		
94 - South of Duck Key	8.5	0.3	14		
93 - South of Duck Key	13.8	1.2	22		
Middle Florida Keys Total (4)	9.1	1.9	23	14.5	2.9
Lower Florida Keys NMS					
338 - South of Bahia Honda Key	12.8	1.4	20		
179 - West of American Shoal	6.5	3.8	18		
160 - North of Pelican Shoal	8.5	0.3	14		
164 - West of Pelican Shoal	8.8	0.8	12		
178 - West of Pelican Shoal	10.3	0.6	17		
166 - Eastern Sambo RO**	7.3	0.8	13		
332 - Eastern Sambo RO**	3.5	1.0	7		
334 - Western Sambo ER**	9.8	1.0	17		
167 - Western Sambo ER**	9.5	0.5	14		
163 - West of Western Sambo ER	13.3	1.1	22		
335 - Sand Key SPA**	14.0	0.9	22		
169 - Sand Key SPA**	9.0	0.8	18		
162 - West of Western Dry Rocks	11.8	0.9	15		
Lower Florida Keys Total (13)	9.6	0.8	34	16.1	1.2
Patchy Hard-bottom Total (21)	9.4	0.6	35	15.3	0.9
<i>Low-relief spur & groove (6-15 m)</i>					
Upper Florida Keys NMS					
52 - Carysfort Reef SPA**	7.5	0.7	12		

Site number/site location	No. species per transect		No. species per site		
	Mean	SE	Total	Mean	SE
241 - Carysfort Reef SPA**	9.5	1.3	15		
51 - Offshore of Dry Rocks SPA	10.5	0.9	16		
50 - Offshore of Dry Rocks SPA	8.0	0.4	11		
49 - Little Pickles Reef	10.3	0.3	16		
48 - Little Pickles Reef	11.0	1.1	17		
Upper Florida Keys Total (6)	9.5	0.6	24	14.5	1.0
Middle Florida Keys NMS					
355 - NE of Conch Reef	17.0	1.5	26		
282 - Conch Reef SPA**	10.0	1.2	15		
354 - Conch Reef SPA**	16.8	0.3	25		
107 - Conch Reef RO**	12.3	0.3	20		
106 - Conch Reef RO**	13.3	0.8	20		
276 - Davis Reef SPA**	10.0	0.7	14		
80 - Davis Reef SPA**	8.8	0.3	14		
102 - South of Lower Matecumbe	13.8	0.3	23		
109 - Tennessee Reef RO**	13.3	1.6	23		
108 - Tennessee Reef RO**	13.8	0.9	21		
113 - NE of Tennessee Light	8.8	1.8	17		
349 - South of Conch Key	6.5	0.5	10		
100 - South of Conch Key	9.5	0.5	15		
99 - East of Delta Shoal	8.5	0.3	13		
110 - Sombrero Key SPA**	12.3	1.0	17		
287 - Sombrero Key SPA**	10.5	0.7	17		
Middle Florida Keys Total (16)	11.6	0.8	34	17.9	1.1
Lower Florida Keys NMS					
337 - South of Bahia Honda Key	12.3	0.8	18		
174 - Looe Key SPA**	5.0	0.8	8		
339 - Looe Key SPA**	6.8	0.6	10		
142 - American Shoal	5.8	3.3	14		
172 - East of Eastern Sambo RO	11.8	0.9	18		
340 - Eastern Sambo RO**	8.8	0.3	13		
175 - Eastern Sambo RO**	12.3	1.7	20		
171 - Middle Sambo Reef	12.5	0.9	19		
170 - Middle Sambo Reef	9.3	1.0	17		
341 - Western Sambo ER**	9.0	0.8	15		
176 - Western Sambo ER**	12.3	1.0	20		
Lower Florida Keys Total (11)	9.6	0.9	30	15.6	1.2
Low-relief Spur & Groove Total (33)	10.5	0.5	40	16.5	0.7