

Family/ Common Name	Species	2009	
		Abundance	Size
Centropomidae			
Common snook	<i>Centropomus undecimalis</i>	S	A
Serranidae			
Bank seabass	<i>Centropristis ocyurus</i>	F	A
Belted sandfish	<i>Serranus subligarius</i>	F	A
Black seabass	<i>Centropristis striata</i>	M	A,J
Gag grouper	<i>Mycteroperca microlepis</i>	S	J
Goliath grouper	<i>Epinephelus itajara</i>	S	A
Apogonidae			
Twospot cardinalfish	<i>Apogon pseudomaculatus</i>	F	A
Carangidae			
Amberjack	<i>Seriola dumerili</i>	M	A,J
Blue runner	<i>Caranx chrysos</i>	A	A
Round scad	<i>Decapterus punctatus</i>	A	A
Lutjanidae			
Gray snapper	<i>Lutjanus griseus</i>	F	A
Lane snapper	<i>Lutjanus synagris</i>	F	J,A
Haemulidae			
Black margate	<i>Anisotremus surinamensis</i>	F	A
Tomtate	<i>Haemulon aurolineatum</i>	A	A,J
Sparidae			
Sheepshead	<i>Archosargus probatocephalus</i>	F	A
Sheepshead porgy	<i>Calamus penna</i>	F	A
Sciaenidae			
Cubby	<i>Equetus umbrosus</i>	F	A,J
Chaetodontidae			
Reef butterflyfish	<i>Chaetodon sedentarius</i>	F	A
Pomacanthidae			
Blue angelfish	<i>Holocanthus bermudensis</i>	S	A
French angelfish	<i>Pomacanthus paru</i>	S	A
Pomacentridae			
Yellowtail reeffish	<i>Chromis enchrysurus</i>	M	A,J
Labridae			
Slippery dick	<i>Halichoeres bivittatus</i>	M	J
Scorpaenidae			
Spotted scorpionfish	<i>Scorpaena plumeiri</i>	F	A
Tetraodontidae			
Bandtail puffer	<i>Sphoeroides spengleri</i>	F	A
Sharpnose puffer	<i>Canthigaster rostrata</i>	F	A
	Total	24	

Abundance Key: S=single, F=few (2-10), M=many (11-100), A=abundant (>100)
 Size Key: A=adult, J=juvenile, A/J=intermediate

Table 20. Jack MacDonald Artificial Reef fish species census.

3.16 Shirley Artificial Reef

- Location: South County Reef
- Materials: Concrete, steel

- Maximum Depth: 66 feet
- Reef High Point: 61 feet
- Year Created: 2007
- Monitoring Date: 10/8/2009

3.16.1 History of Shirley Artificial Reef

Nearly 2,000 tons of large concrete and steel construction waste was delivered to Harbour Pointe Park in Ft. Pierce in 2007 and early 2008 and stockpiled prior to deployment offshore of Martin County. In June 2008, it was loaded on barges and shipped to the South County Artificial Reef area. A total of 249 tons of these materials were dropped in the southwest corner of the reef area from the anchored barge to form the Shirley Artificial Reef.

3.16.2 Structural Summary

The maximum depth at this artificial reef site is about 66 feet with a maximum relief of about 5 feet. The footprint of the site is generally round with an irregular margin and occupies about 0.4 acres of seafloor. The deployment barge was securely moored at two points when the reef materials were dropped and the large concrete components settled in a single pile, although a few pieces settled to the bottom a short distance from the reef pile. Several large culvert sections provide cavernous recesses that are used extensively by large and small fish alike. The seafloor at this site is comprised of a shell/coarse sand mixture and appears to provide a solid base for the heavy concrete pieces, as scouring is not significant. Figure 31 shows a chart with the location of the Shirley Reef.



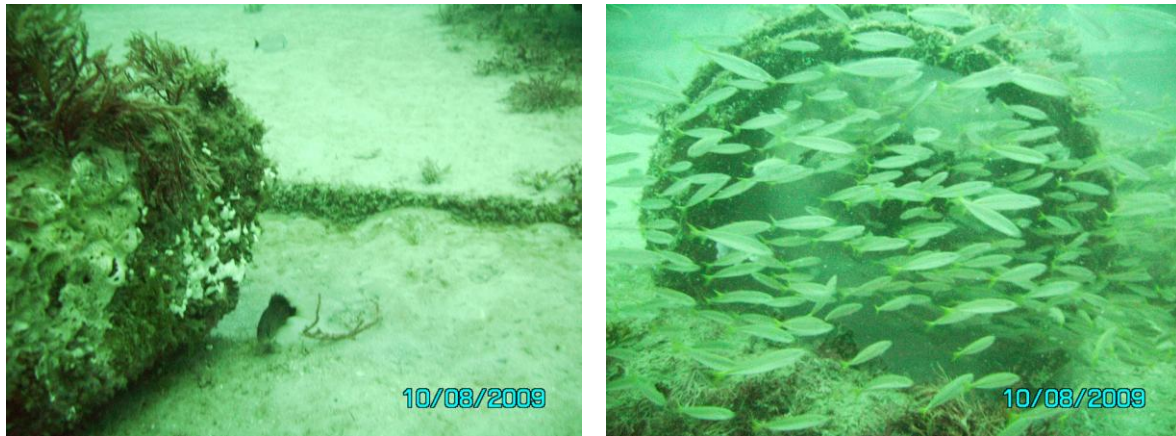


Figure 33. Shirley Artificial Reef 2009 photographs. Note the juvenile snowy grouper in the lower left photo.

3.16.3 Biological Survey Results

Fish surveys indicate a particularly diverse assemblage of fishes, although 2009 was only the first year of monitoring since deployment. Jacks, seabasses and wrasses represented the most numerous species of fishes. As at most of the South County Reef sites, vast schools of adult and juvenile round scad were abundant around and above the reef crest, while the demersal species showed an affinity for the reef itself and the numerous crevices and refugia. Plants and invertebrates observed on the artificial reef included red, brown and green algae, hydroids, sea anemones, sea urchins, barnacles, sea cucumbers, arrow crabs, hermit crabs and encrusting sponges. Table 21 presents the fish species observed during 2009.

Family/ Common Name	Species	2009	
		Abundance	Size
Serranidae			
Belted sandfish	<i>Serranus subligarius</i>	M	A,J
Black seabass	<i>Centropristis striata</i>	M	A,J
Goliath grouper	<i>Epinephelus itajara</i>	F	A
Snowy grouper	<i>Epinephelus niveatus</i>	S	J
Apogonidae			
Flamefish	<i>Apogon maculatus</i>	F	A
Twospot cardinalfish	<i>Apogon pseudomaculatus</i>	F	A
Echeneididae			
Sharksucker	<i>Echeneis naucrates</i>	S	A
Carangidae			
Almaco jack	<i>Seriola rivoliana</i>	F	A/J
Amberjack	<i>Seriola dumerili</i>	F	J
Bar jack	<i>Caranx ruber</i>	S	J
Blue runner	<i>Caranx chrysos</i>	M	A
Rainbow runner	<i>Elegatis bipinnulata</i>	F	A
Redtail scad	<i>Decapterus tabl</i>	M	A
Round scad	<i>Decapterus punctatus</i>	A	A,J

Family/ Common Name	Species	2009	
		Abundance	Size
Lutjanidae			
Gray snapper	<i>Lutjanus griseus</i>	M	A
Lane snapper	<i>Lutjanus synagris</i>	M	A,J
Yellowtail snapper	<i>Ocyurus chrysurus</i>	F	A,J
Haemulidae			
Black margate	<i>Anisotremus surinamensis</i>	F	A
Tomtate	<i>Haemulon aurolineatum</i>	A	A,J
Sparidae			
Sheepshead	<i>Archosargus probatocephalus</i>	M	A
Sheepshead porgy	<i>Calamus penna</i>	M	A
Sciaenidae			
Cubbyu	<i>Equetus umbrosus</i>	F	A
Pomacanthidae			
Blue angelfish	<i>Holocanthus bermudensis</i>	F	A,J
French angelfish	<i>Pomacanthus paru</i>	S	A
Pomacentridae			
Beaugregory	<i>Pomacentrus leucostictus</i>	M	A,J
Blue chromis	<i>Chromis cyaneus</i>	F	A
Yellowtail reeffish	<i>Chromis enchrysurus</i>	M	A,J
Labridae			
Bluehead	<i>Thalassoma bifasciatum</i>	S	A
Slippery dick	<i>Halichoeres bivittatus</i>	M	A,J
Spanish hogfish	<i>Bodianus rufus</i>	F	A
Spotfin hogfish	<i>Bodianus pulchellus</i>	F	A
Scaridae			
Stoplight parrotfish	<i>Sparisoma viride</i>	S	J
Acanthuridae			
Doctorfish	<i>Acanthurus chirurgus</i>	F	A,J
Scorpaenidae			
Spotted scorpionfish	<i>Scorpaena plumeiri</i>	F	A
Tetraodontidae			
Bandtail puffer	<i>Sphoeroides spengleri</i>	F	A
Sharpnose puffer	<i>Canthigaster rostrata</i>	S	A
	Total	36	

Abundance Key: S=single, F=few (2-10), M=many (11-100), A=abundant (>100)
 Size Key: A=adult, J=juvenile, A/J=intermediate

Table 21. Shirley Artificial Reef fish species census.

3.17 The Heap Artificial Reef

- Location: South County Reef
- Materials: Concrete
- Maximum Depth: 68 feet
- Reef High Point: 63 feet