

5.5 HIGH QUEEN AND ZEPPO REEF

- Location: Sirotkin Reef
- Materials: Steel Tugboat and 120' barge
- Maximum Depth: 190 feet
- Reef High Point: 175 feet
- Year Created: 2003
- Monitoring Date: 9/29/2011
- Total Cost: There was no cost to Martin County

5.5.1 History of the High Queen and Zeppo Reef

In Dec. 2002 a 57-foot tugboat known as the “High Queen”, a converted Navy LCM-6, sank at the St. Lucie Inlet in rough seas while towing an empty 120-foot long steel barge through the inlet which also sank. Fortunately all crewmembers survived without serious injuries and were rescued after being washed up upon the rocks of the north jetty. Both vessels floundered up against the north jetty’s large boulders and sank within hours.

Seas that day were in the 3-5 foot range, and rough seas continued for several days after the accident. Water depths immediately offshore of the north jetty are 8 – 18 feet, so that both sunken vessels protruded above the water surface for several months. The hulls began to break apart and in March and April of 2003 the salvage contractor utilized commercial divers to cut the hulls apart into smaller sections and raise the pieces up onto a salvage barge for disposal. Once cleaned of all hazardous materials and inappropriate components were removed; the material was sunk along with the salvage barge in 190 feet of water.

Although the cut up remnants of both the tugboat “High Queen” and the steel barge it had been towing were secured on top of the barge “Zeppo” with chains and cables, the “High Queen” and barge remnants on top of the “Zeppo” barge did not sink as one component as planned. During the flooding of the salvage barge, the barge lifted-up and rolled to one side just prior to sinking allowing the steel components of the other two vessels to break the hold-down cables and slide off the barge. Therefore there was a scattering of the materials on the bottom just to the east and around the whole barge. Part of the High Queen’s hull hit the seafloor first and the Zeppo landed partially on top of it and created a narrow angular space under the Zeppo’s hull providing an ideal habitat for large black and gag grouper to hide. On the south side of the Zeppo most of the steel remnants lie in a 10 ft high pile of interlocking pieces of twisted steel. This seems to have created a perfect hiding place for smaller fish to hide and escape larger predators’ advances. A chart showing the location of the High Queen and Zeppo reef is shown in Figure 14.



Figure 14. Chart view of the Sirotkin Reef site showing the High Queen and Zeppo location.

5.5.2 Structural Summary

An assessment of the artificial reef shows that both raked ends of the Zeppo are partially collapsed probably caused when it hit the seafloor. The intact hull of the Zeppo is upside down and cracks in the hull can be seen at each end. A pre-deployment inspection of the Zeppo revealed existing cracks in the hull. There is no way to determine which, if any, cracks are new, but as found with most barges used for artificial reef materials eventually the barge will begin to collapse as the side plates give way to the forces of the ocean environment. The photographs in Figure 15 show the general condition of the High Queen and Zeppo reef observed during the monitoring dive.

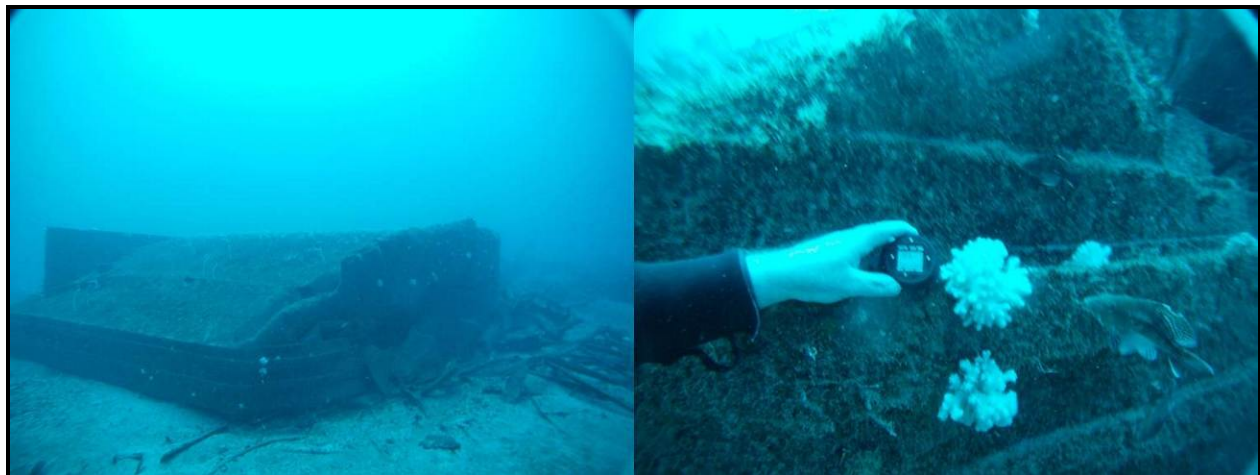


Figure 15. High Queen and Zeppo Artificial Reef 2011 photos.

5.5.3 Biological Survey Results

Five of the nine fish species documented at this site are considered important sport fish: warsaw grouper, greater amberjack, black sea bass, gag grouper, and king mackerel. The overall complexity of this artificial reef with its diverse assortment of surfaces, shapes, and voids makes it a truly unique deepwater artificial reef structure. Table 16 and Table 17 list the species/taxa, their relative abundance and size class (adult, intermediate, and juvenile) observed during the monitoring dive.

Table 16. High Queen and Zeppo Artificial Reef Fish Species Census.

Family/ Common Name	Species	2011	
		Abundance	Size
Carangidae			
Greater Amberjack	<i>Seriola dumerili</i>	M	A
Dasytidae			
Southern Stingray	<i>Dasyatis americana</i>	S	A
Pomacentridae			
Yellowtail reeffish	<i>Chromis enchrysurus</i>	M	A
Serranidae			
Bank sea bass	<i>Centropristis ocyurus</i>	M	J & A
Black sea bass	<i>Centropristis striata</i>	M	A
Roughtongue Sea bass	<i>Pseudogramma gregoryi</i>	M	J & A
Warsaw grouper	<i>Epinephelus nigritus</i>	S	A
Gag grouper	<i>Mycteroperca microlepis</i>	F(4)	A
Scombridae			
King mackerel	<i>Scomberomorus cavalla</i>	F	A
	Total	9	

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 17. High Queen and Zeppo Artificial Reef Benthic Species Census.

	Common Name	Scientific Name
Echinoderms	Rock Boring Urchin	<i>Echinometra lucunter</i>
	3 Rowed Sea Cucumber	<i>Isostichopus badiionotus</i>
	Common Arbacia Urchin	<i>Arbacia punctulata</i>
	Sea Star	Unidentified species
Cnidarians	Sea Anemones	<i>Aptasia sp.</i>
	Hydroids	Unidentified species
Ascidians	Overgrowing Tunicates	<i>Didemnidae</i>
	Giant Tunicates	<i>Polycarpa spongiabilis</i>
	Button Tunicates	<i>Distaplia corolla</i>

	Common Name	Scientific Name
Crustaceans	Yellowline Arrow Crab	<i>Stenorhynchus seticornis</i>
	Giant Hermit Crab	<i>Anomurans</i>
	Rough Box Crab	<i>Calappa gallus</i>
	Caribbean Spiny Lobster	<i>Panulirus argus</i>
Mollusca	Rock Snails	<i>Muricidae</i> (Unidentified Species)
	Octopus	Unidentified Species
	Cowery Shell	
Ectoprocta	Encrusting Bryozoans	Unidentified Species
Anthozoa	Gorgonians	
Porifera	Star Encrusting Sponge	<i>Halisarca sp.</i>
	Orange Encrusting Sponge	<i>Ulosa ruetzleri</i>