

5.11 Wickstrom Artificial Reef

- Location: Sirotkin Reef – NE Quadrant
- Materials: Steel Ship (Coastal Freighter)
- Maximum Depth: 193 ft (in scour trench)
- Max. Seafloor Depth: 189 ft (on seafloor next to ship on east side)
- Reef High Point: 130 ft (on top of bridge mast support column)
- Profile Height: 59 ft (from seafloor to top of bridge mast support column)
- Year Created: 2003
- Monitoring Date: 9/6/2010
- Total Cost: \$17,000 (Martin County)

5.11.1 History of the Wickstrom Artificial Reef

The Wickstrom was previously known as the Lady Lora, Tauros, and US Army FS 553. The ship is a 168-ft. long coastal freighter that had been sitting idle in the Miami River for about 4 years. The funding source for the creation of the reef was provided by Martin County in the amount of \$17,000. A cooperative union of many groups made the acquisition, transport, and deployment possible beginning in the spring of 2002. Some of the groups include: Martin County's Engineering Department, Florida Sportsman Magazine, Martin County Anglers Club (MCAC), Florida Oceanographic Society (FOS), McCulley Marine Services, Jones Shipyard, and the FOS Reef Research Dive Team.

The vessel was purchased from Jones shipyard in Miami, Florida with funds from Karl Wickstrom, the founder and chief editor of Florida Sportsman magazine, and the MCAC Reef Fund. Martin County's Board of County Commissioners' Artificial Reef Program funded the transport, administrative, deployment and annual monitoring costs of the project.

On Tuesday January 21, 2003 the "Wickstrom" was intentionally sunk in 188 feet of water in the northeast quadrant of the Sirotkin permitted artificial reef area. The ship was deployed resting perfectly upright located approximately 400 feet north of the previously sunk "Tree Barge". Figure 27 shows a chart with the location of the Wickstrom Artificial Reef.

This deepwater offshore site has become a very popular destination for many private and charter sport fishing captains as well as some commercial fishing businesses. However, because of the depth, technical training, experience, and equipment necessary to dive this site very few sport divers have visited the site.

In Sept. 2004 Martin County was hit by two major hurricanes (Frances, Category 2 & Jeanne, Category 3) followed by Hurricane Wilma in 2005; these hurricanes had great impacts on the Wickstrom, which are addressed, in the Structural Summary section below.

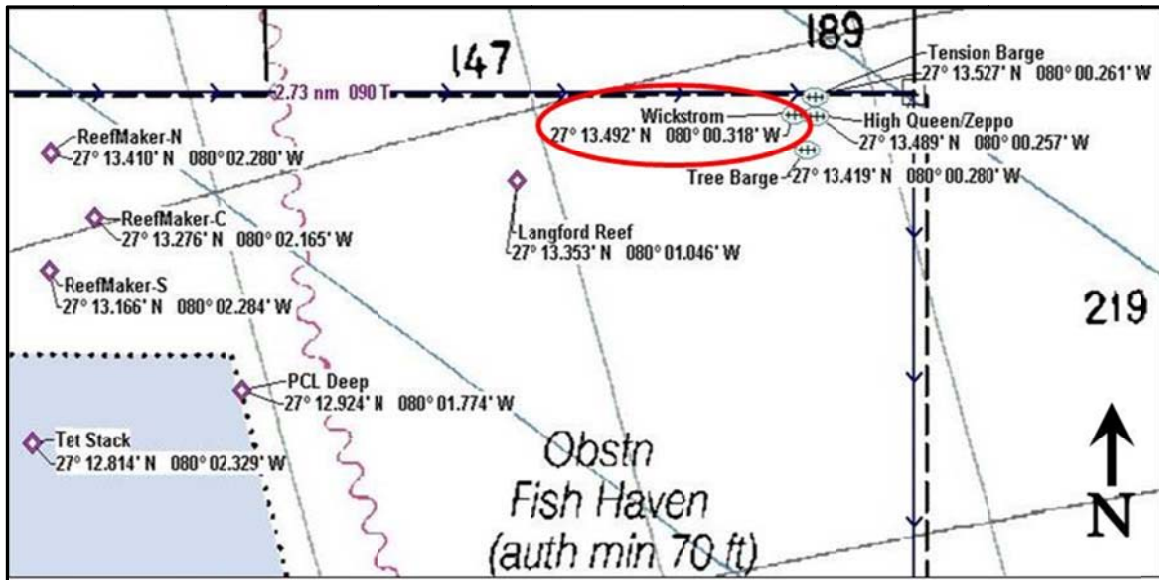


Figure 27. Chart view of Sirotkin Reef showing location of Wickstrom Artificial Reef.

5.11.2 Structural Summary

Until 2004 the changes mainly included a general increase in total biomass in, around and attached to the ship. In Sept. 2004 the Martin County area was impacted by two major hurricanes within a month's time (Frances Category 2 & Jeanne Category 3) both of which made landfall at the same spot on shore in South Hutchinson Island. The tracks of both hurricanes passed directly over the Wickstrom just prior to making landfall. Kerry Dillon of Sea Rover Services made the following post hurricane observations in the fall of 2004:

- The Wickstrom was broken in two sections just aft of the main superstructure.
- The two sections were separated by approx. 15 to 30 ft in a jagged separation
- The stern section shifted further to the east and now faces NE instead of north as when it was deployed
- The bow section is still facing slightly east of due south as it was when deployed
- The entire bow section hull has sawed itself into the seafloor below the sand and into the limestone substrate by 4 ft creating a smooth walled trench with limestone on one side and the steel hull plates on the other (See Figure 29, Left side)
- Cracks exist on other areas of the ship from either the initial deployment impact or the hurricanes or both
- The DGPS derived Lat/Long coordinates of the site have not changed at all
- The overall top depths of the ship is slightly deeper than when first deployed as a result of the settling into the seafloor

Since 2005 no further structural changes have been located during annual monitoring efforts. Figure 28 and Figure 29 display photographs taken during the 2010 monitoring survey showing the Wickstrom's superstructure, *Oculina* corals growing, large schools of fish surrounding the reef and the general conditions of the reef observed during the dive.



Figure 28. Wickstrom Artificial Reef photographs from 2010.

Identification of species in the photographs shown above in clockwise order from the upper-left photograph are (1) *oculina varicosa* coral, (2) greater amberjacks, (3) yellowline arrow crab and *oculina varicosa* coral on hull, (4) sea urchin and 8-legged sea star, (5) *oculina varicosa* coral on reefmaker unit, and (6) unidentified school of baitfish.

As mentioned above, Figure 29 shows the trench (left photo) carved into the bottom by the ship as a result of repetitive motion of the ship's hull on the bottom substrate. The photograph on the right shows 1000's of baitfish schooling around the smoke stack funnel of the Wickstrom.

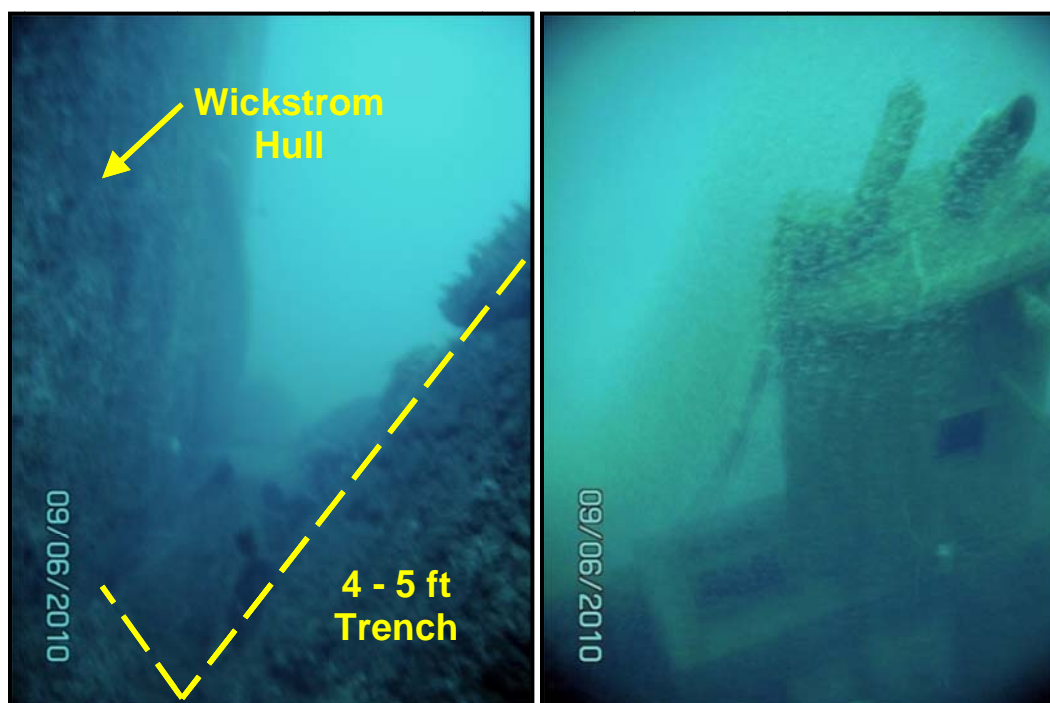


Figure 29. Wickstrom hull groove cut into the sea floor (Left), Wickstrom superstructure (Right).

5.11.3 Biological Survey Results

On this monitoring event only 11 fish species were identified. As experienced on previously monitored deepwater artificial reef sites, the specific fish census fluctuates greatly dependent on current, water temp, meteorological seasons, breeding seasons, and other factors. During other events in previous years many more species were seen. Baitfishes are another type of fish species that come and go to a specific site randomly. There have been other dives on the Wickstrom where 1000s of baitfish in large schools are seen darting all around the site and many fish feeding upon them. This day large baitfish schools were seen. Large Goliath Grouper of over 500 lbs. have been documented on this site many times before yet on this day none were seen.

Invertebrate biomass on the artificial reef has increased substantially in the last several years at this site. On deep sites this is an important first step in the food chain because it takes longer to establish than on shallower sites due to the limited amount of sunlight that reaches the deep-water surfaces. This sunlight is important for the photosynthesis process, which supports the large number of algae species. Even though it takes a few more years to establish, once established the growth continues to take hold of every surface on the metal ship. Even inside the ship where no or very little sunlight washes the surfaces benthic growth exists. The Federally protected deepwater stony coral species *Oculina varicosa* is now found on the outside of the hull's vertical surfaces as well as deep inside the ships engine room and other compartments. This species unlike most shallow water coral species does not need light to survive; rather it is a filter feeder. Over time it is hoped the entire wreck will become white with the beautiful coral branches of this important coral species. Table 26 below presents the finfish species documented and Table 27 presents the benthic species observed.

Table 26. Wickstrom Artificial Reef fish species census.

Family/ Common Name	Species	2010	
		Abundance	Size
Serranidae			
Black seabass	<i>Centropristis striata</i>	M	A
Bank seabass	<i>Centropristis ocyurus</i>	M	A
Yellowmouth grouper	<i>Mycteroperca interstitialis</i>	S	A
Roughtongue seabass	<i>Pronotogrammus martinicensis</i>	F	J & A
Scamp	<i>Mycteroperca phenax</i>	F	A
Black Grouper	<i>Mycteroperca bonaci</i>	F	A
Carangidae			
Amberjack	<i>Seriola dumerili</i>	A	A
Lutjanidae			
Red snapper	<i>Lutjanus campechanus</i>	F	A
Sparidae			
Sheepshead porgy	<i>Calamus penna</i>	M	A
Sciaenidae			
Cubby	<i>Equetus umbrosus</i>	F	A
Ephippidae			
Atlantic spadefish	<i>Chaetodipterus faber</i>	M	A
	Total	11	

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 27. Wickstrom Artificial Reef benthic species census.

	Common Name	Scientific Name
Echinoderms	Common Arbacia Urchin	<i>Arbacia punctulata</i>
	Variiegated Urchin	<i>Lytechinus variegatus</i>
	2 -spined Sea Star	<i>Astropecten duplicatus</i>
	8-legged Sea Star	Unidentified species
Cnidarians	Hydroids	Unidentified species
Scleractinia	Large ivory coral	<i>Oculina varicosa</i>
Ascidians	Tunicates	Many unidentified species
Crustaceans	Yellowline Arrow Crab	<i>Stenorhynchus seticornis</i>
	Sessile barnacles	<i>Balanus trigonus</i>
Other	Encrusting Bryozoans	Unidentified Species
	Encrusting Sponges	Many unidentified Species