

## 5.8 GRAND TETON ARTIFICIAL REEF

- Location: Ernst Reef
- Materials: Concrete, steel
- Maximum Depth: 65 feet
- Minimum Depth: 62 feet
- Reef High Point: 34 feet
- Year Created: 2007
- 2009 Monitoring Date: 09/26/2009 (by others)
- 2013 Monitoring Date: 09/03/2013
- Total Cost: \$23,221.25 (64.5% FWC grant 06112 & 35.5% Martin County)

### 5.8.1 History of the Grand Teton Reef

According to the County's MPR, on June 26 and 30, 2007, 728 tons of concrete culverts, bridge components, and other large forms were unloaded from an anchored barge to form the Grand Teton Reef. Refer to Figure 28 for the chart location.

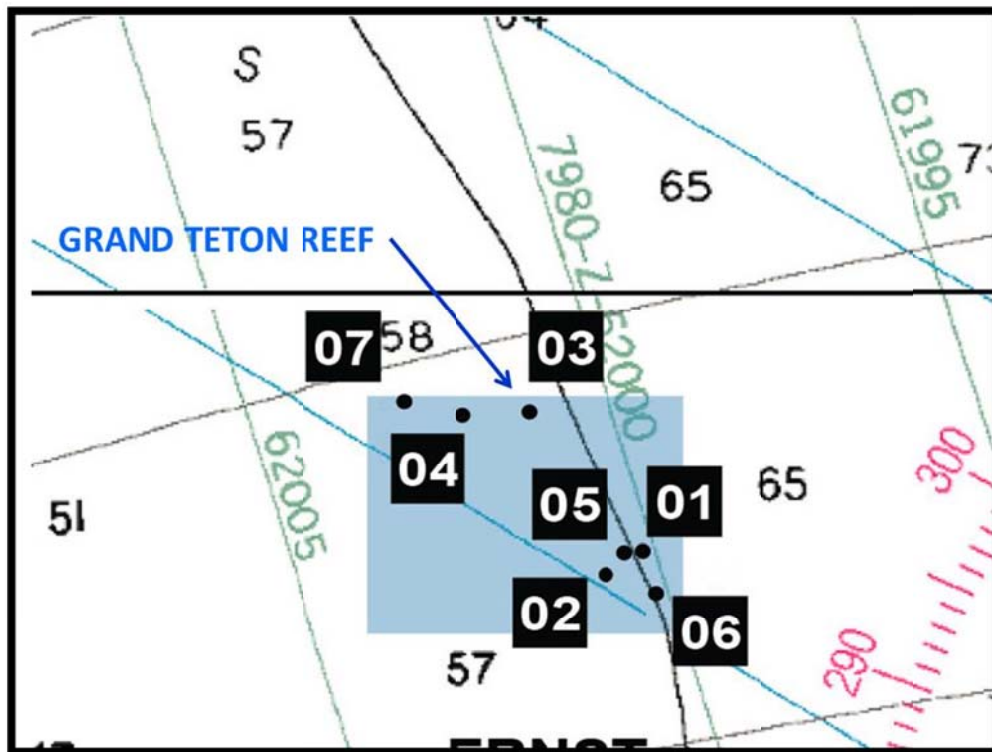


Figure 28. Chart of the Ernst Reef area showing the Grand Teton Reef location.

## 5.8.2 Structural Summary

The maximum depth at this artificial reef site is now 65 feet (the 2008 monitoring event documented at maximum depth of 62 feet deep, so some scouring has occurred) with a reef high point recorded of 34 feet deep (consistent with past monitoring efforts). The footprint of the site is generally round, but has an irregular margin and occupies about 0.5 acres of seafloor. The sheer volume and variety of materials placed at this site occupy a relatively small footprint. 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. Numerous concrete light posts were placed on this reef and several project upward from the reef pile prominently. 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 and steel pieces; however, there was evidence of some scouring.



Figure 29. Grand Teton Reef, Goliath Grouper, 2013.

Table 27. Summary of Grand Teton Depth Measurements, 2013

Direction	Perimeter Depth (ft)
North	65
East	63
South	62
West	64
Reef top Depth: 34	

### 5.8.3 Biological Survey Results

Fish surveys indicate an increase in species diversity since 2008, although 2009 was only the second year of monitoring since deployment. Seabasses and jacks represented the most numerous species in both 2008 and 2009, although grunts, wrasses and snappers were also common. Vast schools of adult and juvenile round scad were observed around and above the reef crest. Similarly, several lionfish were observed.

Invertebrate biomass on the artificial reef also appeared abundant. The most common species included sea urchins, hydroids, tube worms, sea anemones, encrusting sponges and sea cucumbers. Fire worms and various crabs were also observed. The fish and invertebrate species observed during the monitoring dive are listed below in Table 28 and Table 29.

**Table 28. Grand Teton Reef Fish Species Census.**

Family/Common Name	Species	2013	
		Abundance	Size
<b>Elasmobranchs</b>			
Nurse shark	<i>Ginglymostoma cirratum</i>	S	A
Southern stingray	<i>Dasyatis americana</i>	S	A
<b>Clupeidae</b>			
Spanish sardine	<i>Sardinella aurita</i>	A	A
<b>Syngnathidae</b>			
Pipefish	<i>Syngnathus</i> sp.	F	A
<b>Centropomidae</b>			
Snook	<i>Centropomus undecimalis</i>	M	A
<b>Serranidae</b>			
Bank seabass	<i>Centropristis ocyurus</i>	M	A,J
Belted sandfish	<i>Serranus subligarius</i>	A	A
Black seabass	<i>Centropristis striata</i>	F	A,J
Goliath grouper	<i>Epinephelus itajara</i>	F	A,J
Sand perch	<i>Diplectrum formosum</i>	M	A,J
Scamp	<i>Mycteroperca phenax</i>	F	J
<b>Grammistidae</b>			
Whitespotted soapfish	<i>Rypticus maculatus</i>	F	A
<b>Echeneididae</b>			
Sharksucker	<i>Echeneis naucrates</i>	S	A
<b>Carangidae</b>			
Blue runner	<i>Caranx chrysos</i>	F	A
Round scad	<i>Decapterus punctatus</i>	A	A
<b>Lutjanidae</b>			
Gray snapper	<i>Lutjanus griseus</i>	M	A
Lane snapper	<i>Lutjanus synagris</i>	M	A
Red snapper	<i>Lutjanus campechanus</i>	F	A,J
Yellowtail snapper	<i>Ocyurus chrysurus</i>	F	A
<b>Haemulidae</b>			
Pigfish	<i>Orthopristis chrysoptera</i>	M	A
Porkfish	<i>Anisotremus virginicus</i>	A	A

Family/Common Name	Species	2013	
		Abundance	Size
Tomtate	<i>Haemulon aurolineatum</i>	A	A,J
<b>Sparidae</b>			
Sheepshead	<i>Archosargus probatocephalus</i>	A	A
Sheepshead porgy	<i>Calamus penna</i>	M	A
<b>Sciaenidae</b>			
Cubbyu	<i>Equetus umbrosus</i>	A	A
<b>Mullidae</b>			
Spotted goatfish	<i>Pseudupeneus maculatus</i>	F	A
<b>Chaetodontidae</b>			
Reef butterflyfish	<i>Chaetodon sedentarius</i>	F	A
<b>Pomacanthidae</b>			
Blue angelfish	<i>Holocanthus bermudensis</i>	F	A
<b>Pomacentridae</b>			
Beaugregory	<i>Stegastes leucostictus</i>	F	A
Yellowtail reeffish	<i>Chromis enchrysurus</i>	M	A,J
<b>Labridae</b>			
Slippery dick	<i>Halichoeres bivittatus</i>	M	A
Spanish hogfish	<i>Bodianus rufus</i>	F	A
<b>Clinidae</b>			
Hairy blenny	<i>Labrisomus nuchipinnus</i>	M	A
<b>Acanthuridae</b>			
Gulf surgeonfish	<i>Acanthurus randalli</i>	F	A
<b>Scombridae</b>			
Little tunny	<i>Euthynnus alletteratus</i>	M	A
<b>Scorpaenidae</b>			
Lionfish	<i>Pterois sp.</i>	F	A
Spotted scorpionfish	<i>Scorpaena plumieri</i>	M	A
<b>Bothidae</b>			
Southern flounder	<i>Paralichthys lethostigma</i>	F	A
<b>Tetraodontidae</b>			
Bandtail puffer	<i>Sphoeroides spengleri</i>	M	A
Sharpnose puffer	<i>Canthigaster rostrata</i>	M	A,J
<b>TOTAL</b>		<b>40</b>	

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 29. Grand Teton Artificial Reef Benthic Species Census.**

	<b>Common Name</b>	<b>Scientific Name</b>
<b>Echinoderms</b>	Rock Boring Urchin	<i>Echinometra lucunter</i>
	3 Rowed Sea Cucumber	<i>Isostichopus badionotus</i>
<b>Cnidarians</b>	Sea Anemones	<i>Aptasia sp.</i>
	Hydroids	Unidentified species
	Algae Hydroids	<i>Thyroscyphus ramosus</i>
<b>Ascidians</b>	Overgrowing Mat Tunicates	<i>Trididemum solidum</i>
	Giant Tunicates	<i>Polycarpa spongiabilis</i>
	White Speck Tunicate	<i>Didemnum conchyliatum</i>
<b>Crustaceans</b>	Yellowline Arrow Crab	<i>Stenorhynchus seticornis</i>
	Giant Hermit Crab	<i>Petrochirus diogenes</i>
	Spiny lobster	<i>Panulirus argus</i>
<b>Mollusca</b>	Rock Snails	<i>Muricidae</i> (Unidentified Species)
<b>Ectoprocta</b>	Encrusting Bryozoans	Unidentified Species
<b>Polychaeta</b>	N/A	<i>Spiroridae</i>
<b>Porifera</b>	Star Encrusting Sponge	<i>Halisarca sp.</i>
	N/A	<i>Clathria sp.</i>

## 5.9 WEST 400 REEF

- Location: Ernst Reef
- Materials: Concrete
- Maximum Depth: 65 feet
- Minimum Depth: 62 feet (last recorded as the maximum depth in 2009)
- Reef High Point: 46 feet
- Year Created: 2007
- 2009 Monitoring Date: 09/26/2009 (by others)
- 2013 Monitoring Date: 09/05/2013
- Total Cost: \$23,221.25 (64.5% FWC grant 06112 & 35.5% Martin County)

### 5.9.1 History of the West 400 Reef

According to the MPR, on June 15, 2007, 474 tons of concrete culverts and other large forms of concrete were unloaded from an anchored barge to form the West 400 Reef. Figure 30 shows a chart with the location of the West 400 Reef.