St. Johns County Capo Reef (North and South)

2022 Reef Observations and Report

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St. Augustine, FL 32084

Contract #: 22-GAS-KIS-16164

U. S. Army Corps of Engineers permit: 199803994 (IB-BL)

Figure 1 - Underwater Image Captured by Joe Kistel at Capo Reef North on 5-19-22

Introduction:

On 6-1-22 and 6-22-22 two reef sites known as Capo Reef North and Capo Reef South were located within the old St. Johns County (SJC) artificial reef permit zone (199803994 IB-BL), and investigated with five scuba divers. Divers explored the underwater reef habitat, made observations visually and with specialized underwater camera equipment, and removed underwater debris hazards encountered. Underwater visibility conditions were ideal, allowing an abundance of marine life to be observed as well as the general layout of reef structures. The reefs appeared to be functioning as intended. The concrete structures placed in the ocean to create the Capo Reef habitat were completely encrusted with marine growth. This growth appears to be supporting a great diversity and abundance of ocean life.

Reef Site Background:

Based on historic references obtained, it appears the Capo reefs was deployed in June of the year 2000. Two loads of miscellaneous concrete structures, including box junctions and culverts, were deployed apparently on the same day (June 29).

Reef Site Location:

The Capo reefs are within the old St. Johns County artificial reef permit zone 199803994 (IB-BL). The reef site is located approximately 31 statute miles from the mouth of the St. Augustine Inlet at an eastward heading of 97°. Historic permit documentation suggests the 199803994 (IB-BL) permit zone was open from 1998 through 2003.

Figure 2: The Capo Reefs are Approximately 31 miles From the St. Aug Inlet

The 199803994 (IB-BL) permit zone is a rough square boundary box with sides approximately 1 mile in length. The corner point locations are below…

NW= 29˚ 51.380'N
080˚ 46.500'W
NE= 29˚ 51.380'N
080˚ 45.500'W
SW= 29˚ 50.220'N
080˚ 46.500'W
SE= 29˚ 50.220'N
080˚ 45.500'W

The Capo reef sites reside in the more northwardly side of the expired permit boundary box. The image below shows the Capo Reef locations our divers investigated in reference to the 199803994 (IB-BL) permit boundary corners.

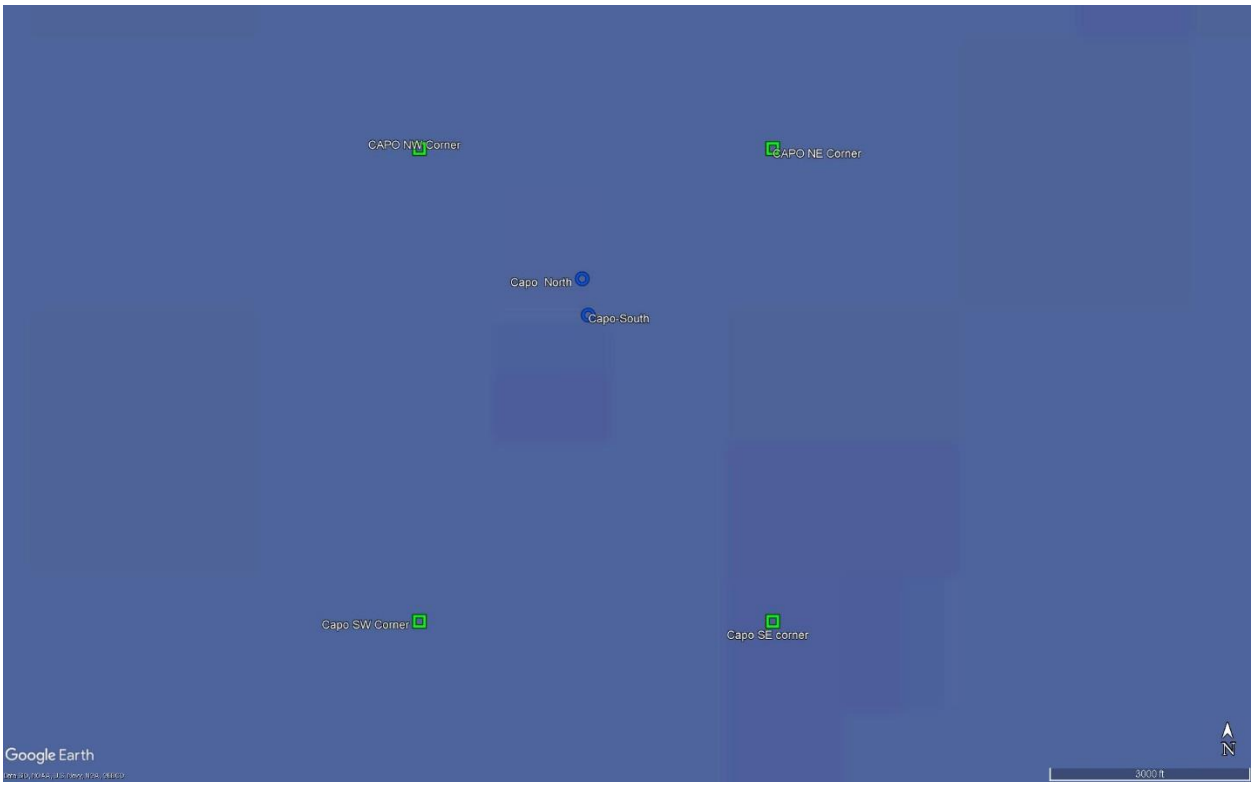


Figure 3: Zoomed in View with Locations of Capo Reefs Where Divers Investigated on 6-1-22 and 6-22-22

During our site investigations the project vessel was secured in fixed position using a double anchorage procedure. A heavy mooring anchor weight was deployed, with an attached line and float, over the intended specific dive location. A traditional anchor was then set upstream of the dive site. The vessel was then aloud to drift back to the mooring float. At this point the anchor rope was secured to the bow and the mooring line secured to the side of the dive vessel. The mooring weight was deployed at the GPS coordinates…

Capo North:
29˚ 51.060'N
080˚ 46.039'W

Capo South:
29˚ 50.971'N
080˚ 46.022'W

The coordinates above are where divers entered the water to commence the underwater dive operations, and will be considered the main reef coordinates for the sake of this report.

Reef Condition:

Figure 4 Underwater View of Encrusted Concrete Structures at Capo North During the Dive Investigation 6-1-22

Figure 5 Blue Angel Fish and Concrete Reef Structures at Capo South 6-22-22

Underwater visibility conditions were ideal during the dive expeditions at the Capo Reefs. Divers reported more than 35 feet of diver sight visibility. Divers were able to make observations of marine life and reef structures, capture video and still imagery, and remove entanglement hazards.

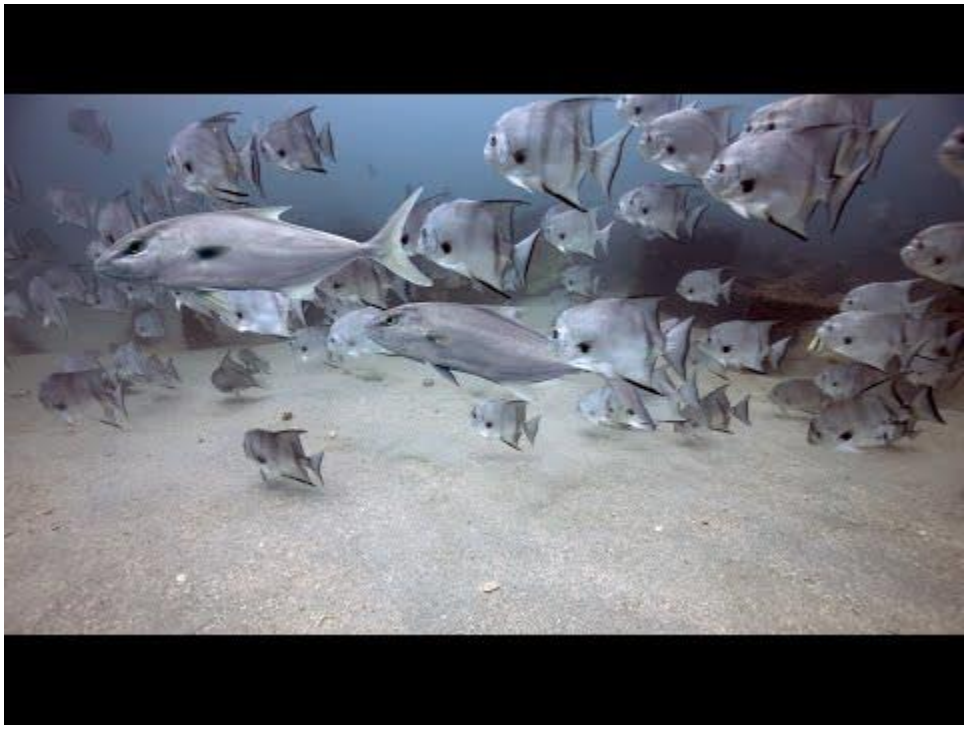
A variety of fish species were present and the sunken concrete structures were completely grown over with marine life. Every inch of concrete surface was hidden under coral, sponge, algae and other encrusting life forms that would not exist in the absence of a solid foundation.

The overall reef observed looked well and appeared to be serving as intended. A great diversity of marine life is benefitting from the placement of these concrete structures. Signs of use by fishermen were present. Anchor rope, snagged monofilament line, and other fishing tackle and debris was found throughout the reef footprint covered. Much of this was removed and will be discussed later in this report.

Foundationally, it appears the concrete structures are fixed in a stable orientation. Concrete pieces are lying on the seafloor somewhat sporadically. Some pieces are congregated together slightly stacked, while others are independently scattered about. The sea floor seemed relatively stable however the sand bottom was somewhat soft. It appears evident that the sand shifts here regularly, likely do to biological activity such as snapper (and other fish) excavations. Major storm activity may cause sand shifts as well. Some of the structures are partially buried due to this sand shifting. The depth recorded was between 97 and 99 feet deep at Capo North and 96 through 98 feet deep at Capo South.

The videos below show a detailed underwater look of the Capo reefs, their inhabitants, and some of the marine debris removal efforts… (Best viewed in HD which may need to be selected in video player settings)

Capo North: 6-1-22

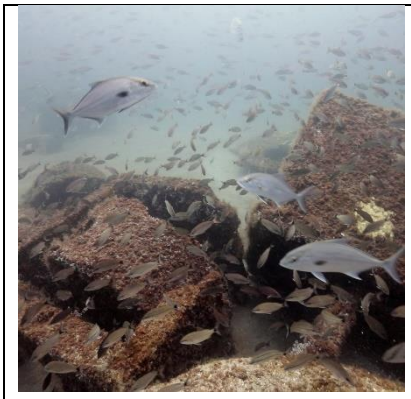
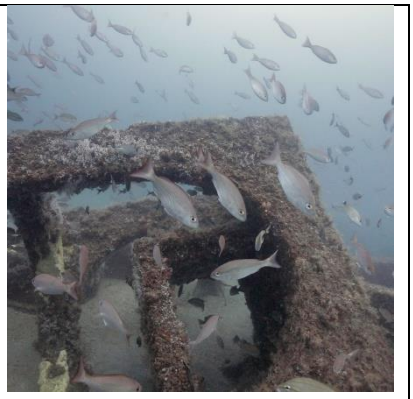
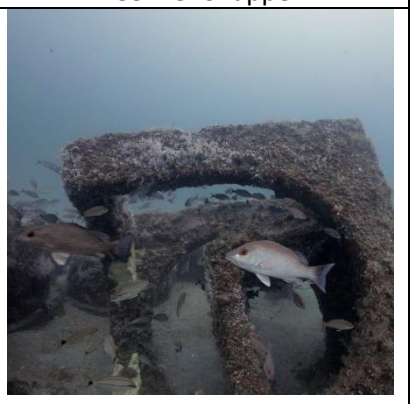
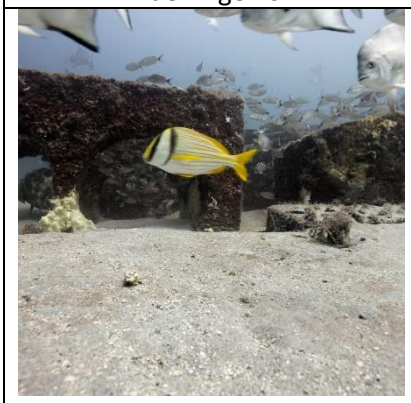


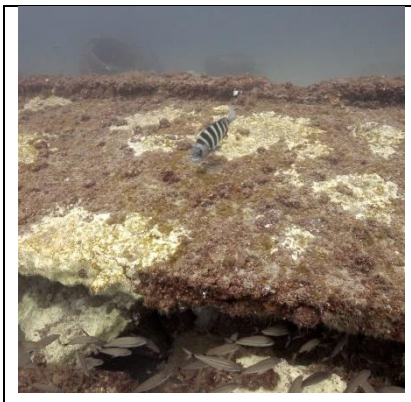
Capo South: 6-22-22

Fish Observed:

Below are tables composed of images of some the fish and marine life observed while documenting the Capo Reefs. These images are screen frame captures from video collected during our expedition dives.

Capo North:

 Almaco Jack	 Amberjack	 Beeliner Snapper
 Blue Angelfish	 Goliath Grouper	 Mangrove Snapper
 Porkfish	 Red Snapper	 Shark (Bull?) and Cobia



Sheepshead

Southern Ray

Spadefish

Spotfin Butterflyfish

Tomtate

Fish Abundance:

Using video footage collected during the Capo Reef North investigation dives, a general idea of fish abundance was computed. Below are the fish encountered and their relative quantities visually observed.

Fish	Quantity
Almaco	30-50
Amberjack	30-50
Atlantic Blue Tang	1-5
Beaugregory Damsel	1-5
Beeliner -Vermillion	>500
Blenny	1-5
Blue Angelfish	20-30
Bluehead Wrasse	1-5
Bull Shark?	1
Great Barracuda	6-10
Cobia	1-5
Goliath Grouper	6-10
Gray Angelfish	1-5
Lionfish	6-10

Mangrove Snapper	30-50
Porkfish	11-20
Pufferfish (Bandtail)	1-5
Queen Angelfish	1-5
Red Snapper	6-10
Sheepshead	11-20
Spadefish	>1000
Spotfin Butterfly	6-10
Spotfin Hogfish	1-5
Soapfish	1-5
Southern Ray	6-10
Tomtate	>1000

Capo South:


Amberjack


Damsel


Blue Angelfish

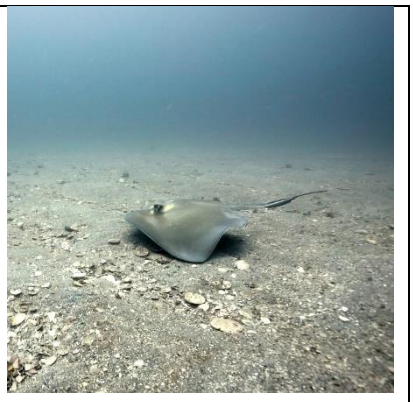

Goliath Grouper


Lookdown


Mangrove Snapper

Porkfish

Sheepshead



Southern Ray

Spadefish

Spotfin Butterflyfish

Tomtate

Fish Abundance:

Using video footage collected during the Capo Reef South investigation dives, a general idea of fish abundance was computed. Below are the fish encountered and their relative quantities visually observed.

Fish	Quantity
Almaco	11-20
Amberjack	51-100
Great Barracuda	11-20
Vermillion Snapper	200-500
Blue Angelfish	11-20
Bluehead Wrasse	1-5
Shark (Bull?)	2
Beaugregory Damsel	6-10
Goliath Grouper	6-10
Lane Snapper	1-5
Lionfish	1-5
Lookdown	11-20
Mangrove Snapper	51-100
Porgy	1-5
Porkfish	21-50

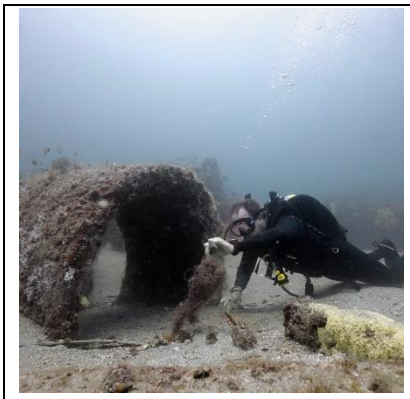
Pufferfish (Bandtail)	1-5
Queen Angelfish	1-5
Sheepshead	1-5
Spadefish	>1000
Spotfin Butterfly	6-10
Soapfish	1-5
Southern Ray	6-10
Townsend Angelfish	1-5
Tomtate	>1000

Note: The fish count data provided above was collected within visibility limits at the portions of the reef area observed. Only animals visually observed could be identified, and there are several variables that could have impacted the observation of species present. In addition, some species may be occasionally present during different seasons and our observations were made during summer expeditions. This information is not likely an accurate description of all the fish species present and/or their respective quantities. The data should however provide a general representation of the Capo Reef biome.

Underwater Debris Removal:

The Capo Reefs are located a further distance from the St. Augustine Inlet then the other reefs monitored during this project. Even so they have likely received moderate fishing use since the deployments in the year 2000. This was evident by items encountered down below. Fishing line was observed and some of the monofilament had attached fishing tackle including lead weights and hooks. Several sections of rope were found and recovered. A lost fishing pole and what is assumed to be a discarded military canister was retrieved.

Pictures of some of the item's divers removed from the Capo Reefs below…


Monofilament Cluster


Fishing Gear and Canister


Military Jettison Housing

Figure 6. Debris and Entanglement hazards Removed from Capo Reef North 6-1-22

Figure 7. Items Removed from Capo Reef South 6-22-22

Note: It is thought that some debris and entanglement items on the Capo reefs are buried and entrapped due to the shifting sands the reef experiences. Monofilament was often found around the base edges of structures and many base edges were buried. It is feasible to think that when these edges were exposed they also entrapped line, and then the line was buried as the structure edges became covered with sand. We also observed what looked like blades of grass sticking up out of the sand in some areas. These were pieces of exposed fishing line with marine growth covering them. When we pulled on these lines we found longer sections of line, and often tackle, buried in the sand. We made similar observations during our Standish reef investigation as well.

Reef Use, Interest, and Survey:

A survey was designed to help better understand the use the combined Capo Reefs receives and to gauge interest in potential future use. The survey was provided to local fishing and scuba diving organizations as well as regional fishermen and scuba divers via a social media ad campaign.

The results of the survey showing the number of selected responses to each question is below...

Total Surveys Completed = 109

1. Have you visited the Capo Reef at any point to fish or scuba dive?
No = 25
Yes, to Both Fish & Dive = 16
Yes, to Fish = 64
Yes, to Dive = 4

2. How many times have you visited the Capo Reef in the past 2 years?
0 =27
1-5 times = 36
6-10 times = 20
11+ times = 26

3. Do you plan to visit the Capo Reef in the future?
Yes, to Fish = 67
Yes, to Dive = 6
Yes, to Both Fish & Dive = 26
No = 10

4. Would you utilize the area if a new artificial reef was created near the Capo Reef?
Yes, to Fish =69
Yes, to Dive =5
Yes, to Both Fish & Dive = 28
No = 7

The results above suggest the majority of survey takers are familiar with, and utilize, the Capo Reef sites. The prominent survey takers appeared to be fishermen, however scuba divers made up a substantial percentage of participants as well. Out of 109 survey takers, only 7 responded negatively suggesting they would not utilize the reef area if it was expanded. Furthermore, many of the survey participants that said that they had never been to the Capo site before, stated they would visit the site if new reef materials were placed in the future. 94% of survey participants stated they would utilize the Capo Reef area if additional artificial reef habitat was created.

Summary/Opinion:

The Capo reef is an artificial reef site regularly utilized by fishermen and scuba divers. The concrete structures intentionally placed in the ocean to create marine habitat are functioning as intended. Each structure is covered in marine growth and a diversity fish species are present. Fishermen and scuba divers visit this reef to experience this marine life.

The Capo Reef sites reside in the expired artificial reef 199803994 (IB-BL) permit boundaries. Should the permit be re-opened, with its same geographical perimeter, it would leave ample space for future reef deployment considerations. The entire area is approximately 1 square mile or 640 acres.

Note:

The original permit, 199803994 (IB-BL), states a vertical clearance of 85 feet must be maintained. This would only allow for 15 feet of reef material structure height off the sea floor and negate any vessel deployment possibilities. It is encouraged that if a new permit is sought after that this variable be revised to 50 feet of clearance. This is a common clearance for other offshore artificial reef permitted areas in the northeast Florida region. Additional permit verbiage, stating the deployment of metal vessels is allowed would also be encouraged.