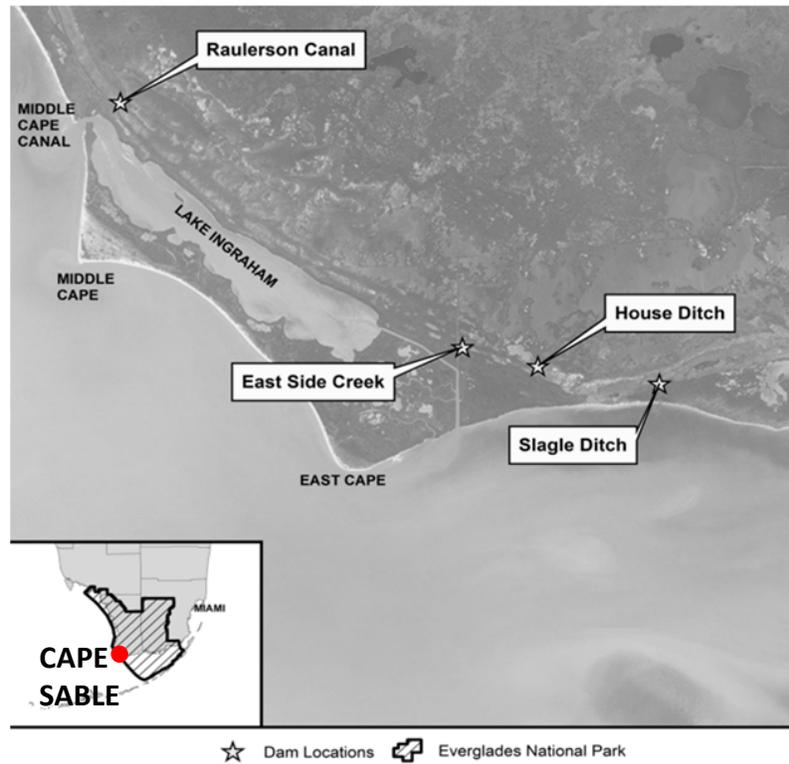


BENTHIC SURVEY OF SEAGRASS ABUNDANCE FOR THE CAPE SABLE PLUG RESTORATION PROJECT



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Introduction

In support of the environmental assessment of the Everglades National Park Cape Sable Canals Plug Restoration Project, a benthic survey for the presence and abundance of seagrass was made at locations expected to be impacted by the proposed activity. The sampling sites were located within, or at the mouths of, several man-made canals. The proposed project intends to repair or replace plug structures in the canals to control saltwater intrusion into the marshes north of the Cape Sable marl ridge. This action may have immediate impacts and long-term effects on water quality downstream and upstream of any construction.

The objective of this benthic survey is to document presence of living marine seagrass on submerged lands downstream of plug sites. The sampling locations are near the following coordinates:

House's Ditch Site: Mouth of canal to open bay with mangroves on each shore; benthos composed of mud silt in shallow areas and sand or gravel sediment in the central deep channel. The channel was more than 2.5 m deep and the mud flats 0.5 to 1.5 m deep.

Coordinates:

25° 07.714N

81° 03.021W

Slagle's Ditch Site: Mouth of canal to open bay with mangroves on each shore; benthos composed of mud silt in shallow areas and sandy shell in the central deep channel. The channel was more than 2.5 m deep and the mud flats 0.5 to 1.5 m deep.

Coordinates:

25° 07.782N

81° 01.567W

Raulerson Canal Site: Deep channel with fast moving water. The channel was more than 2.5 m deep. Canal was scoured hard bottom, and was lined with mangroves on each shore.

Coordinates:

25° 11.254 N

25° 11.253N

81° 08.094W

81° 08.027W

East Side Creek Site: Deep channel with fast moving water. The channel was more than 3.0 m deep. Canal bottom was mud silt and shell. Canal was lined with mangroves on each shore.

Coordinates:

25° 08.257N

25° 08.217N

81° 03.842W

81° 03.868W

Methods

Assessment of seagrass in the selected areas was done by two methods; random point sampling within a grid matrix and point sampling of light attenuation measures. At House Ditch and Slagle Ditch, visual inspection for presence or absence of seagrass was performed at points within a defined area. At Raulerson Canal and East Side Creek, a LiCor-1000 light meter was used to determine whether water conditions are capable of supporting the presence of seagrass.

RESULTS

Survey Area: House Ditch and Slagle Ditch Sites

Points were sampled at randomly selected locations with interval spacing of approximately 5 m within each site (n = 10). Bottom areas of 1 m² were inspected using snorkel gear.

The area consisted of a canal mouth into open bay with mangrove shoreline and a central 2.5 m deep channel. Canal and bay waters at this site were milky brown and opaque and visibility less than 0.15 m from surface to bottom. Benthos was composed of a mud and sand mixture in shallows with sandy shell in the deeper channel area of high flow. No living seagrass was found at either site. Some dead *Halodule wrightii* seagrass leaf blades were part of the detritus and debris on the bottom. *Gracilaria sp.* (red macro-alga) was drifting loose on the substrate in the shallower areas.

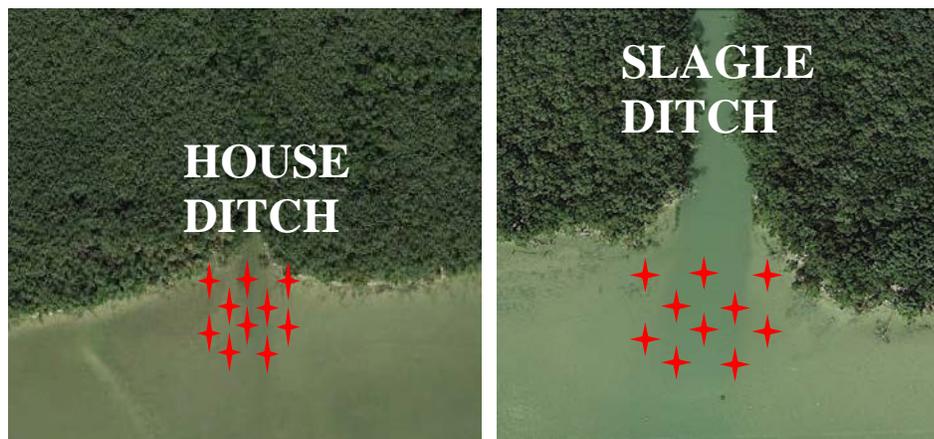


Figure 1. Sample sites at House Ditch and Slagle Ditch.

Survey Area: Raulerson Canal and East Side Creek Sites

Points were sampled at selected locations within each site (n = 2).

Canal waters at this site were milky brown and opaque with visibility less than 0.15 m at the surface (measured by Secchi disk). Water flow rate was high. Crocodiles are commonly present in the canals. Water quality parameters were measured with a handheld YSI probe, and can be seen in Table 1. Penetration of light to 2 m depth was reduced by 92% to 98% of irradiance

measured just below the surface of the water (0.2 m). The attenuation coefficients ranged from 2.7 to 3.3, which can be compared to attenuation of open Florida Bay water of 0.5.



Figure 1. Sample sites at Raulerson Canal and East Side Canal. Inset shows site characteristics.

Table 1. Physical parameters and light measurement at Raulerson and East Side Canals. Irradiance in microEinsteins (μE) was measured at 0.2 m and 2.0 m beneath the water surface. Percent transmission of the light to a point above the bottom was calculated. Light attenuation was calculated.

Site	Dissolved Oxygen (DO) %Saturation	DO mg/L	Salinity (ppt)	Temp (C)	Surface Depth (m)	Surface Irradiance (μE)	Depth (m)	Bottom Irradiance (μE)	% Transmission to bottom	Attenuation coefficient (Kd)
Raulerson	98.5	5.72	41.30	32.43	0.2	1096	2.0	3.08	0.3	3.3
Raulerson	106.5	6.14	41.44	32.78	0.2	1780	2.0	4.37	0.2	3.3
East Side	102.8	5.77	43.37	33.89	0.2	1215	2.0	5.34	0.4	3.0
East Side	105.6	5.89	43.54	34.18	0.2	1094	2.0	8.23	0.8	2.7

PROJECT IMPACTS

Living seagrass was not found or not expected to be found at the four sampled sites. Inspection of House Ditch and Slagle Ditch sites at the mouth of the creeks revealed no living seagrass. Light levels near the bottom of Raulerson and East Side Canals are so low that seagrass are not expected to recruit or survive there. Any proposed construction at the plug sites will not have impact on seagrass downstream, as current conditions exclude seagrass growth at these sites.