

NCAP Seagrass Monitoring Program

Standard Operating Procedures

Last revised: August 30th, 2021

ATTACHMENT 11

1. INTRODUCTION

- 1.1 To establish long-term seagrass monitoring locations, correlated with existing Project COAST sampling locations. Monitoring will be conducted by using 1- meter square quadrats and determining benthic plant coverage by a Braun- Blanquet score following the methods used in the adjacent St. Martins Marsh and Big Bend Seagrasses Aquatic Preserves.
- 1.2 Contractor will use 1-m² quadrats to survey 25 fixed-position sites in the estuaries of four rivers within the NCAP (e.g., Anclote, Pithlachascotee, Weeki Wachee, and Chassahowitzka River estuaries). Species composition and percentage cover of seagrass and macroalgae will be estimated using four randomly placed quadrats at each site, for a total of 100 samples/station.
- 1.3 At the time of seagrass assessment, the presence and number of bay scallops, sea urchins and any exotic species in each quadrat will also be recorded, as well as sediment type, an assessment of epiphyte density on seagrass blades and canopy height of seagrass blades will be recorded. Field condition measurements (depth, water temperature, salinity, pH, and dissolved oxygen concentration) will be recorded at each site as well.
 - 1.3.1 Field conditions are to be recorded using a handheld YSI ProDSS datalogger unit. Calibration procedure will follow the Calibration protocols outlined in the Project COAST SOP which was derived using the DEP SOP handbook.

FIELD PLANNING

- 2.1 SAV surveys will occur during the growing season for this region: May through September annually. Contractor will provide a spreadsheet with coordinates showing where the 100 monitoring locations were established, and monitoring data collected during the peak growing season (dates to be determined in coordination with Big Bend Seagrasses Aquatic Preserves Manager).
- 2.2 Site order is determined by weather and tide conditions.

4. MONITORING PROCEDURES

- 4.1. Datasheet: Document the following sampling event information on a new datasheet for each site:
 - 4.1.1. Site Identification Number
 - 4.1.2. Sampling date
 - 4.1.3. Collector initials (all persons on board)
 - 4.1.4. Abiotic field parameters
 - 4.1.4.1. Data recorder to deploy Handheld YSI ProDSS datalogger, allow values to stabilize, then record field parameters on datasheet in boxes provided.
- 4.2. SITE ASSESSMENTS:
 - 4.2.1. Each site will be assessed annually. Sites are documented by GPS point.
 - 4.2.2. Four (4) 1-m² quadrats are to be randomly assessed at each site; referred to as replicates.

- 4.3. MONITORING ASSESSMENT PROCEDURE: Complete the following at each of the four quadrats per site.
 - 4.3.1. Document any notable field observations associated with quadrat (presence of propeller scarring, engine blowouts, mobile flora or fauna, drift algae)
 - 4.3.2. Document bay scallop and sea urchin counts
 - 4.3.3. Document all SAV by species (including seagrass species and affixed macroalgae), determine Braun-Blanquet scores, epiphyte density and sediment type
 - 4.3.4. Record canopy heights (in centimeters) for three randomly selected seagrass blades of each of the three most prevalent seagrass species
 - 4.3.5. Photo document any notable findings

5. DOCUMENTATION

- 5.1. Complete and recheck datasheet once on the boat. If applicable, take pictures of the datasheet and then store the completed datasheet in clipboard.
- 5.2. Make notes of any relevant observations or problems

Seagrass Data Sheet

Station - Plot:		Collectors:		Date:	
Temperature (°C):	Salinity (ppt):	D.O (mg/L):	pH (SU):	Depth (m):	

QUADRAT 1

Grasses:	HENG - <i>Halophila engelmannii</i>	HWRI - <i>Halodule wrightii</i>	RMAR - <i>Ruppia maritima</i>
	SFIL - <i>Syringodium filiforme</i>	TTES - <i>Thalassia testudium</i>	
Algae:	ACRE - <i>Acetabularia crenulata</i>	BOER - <i>Batophora oerstedii</i>	CASH - <i>Caulerpa ashmeadii</i>
	CCUP - <i>Caulerpa cupressoides</i>	CIST - <i>Codium isthmocladum</i>	CMEX - <i>Caulerpa mexicana</i>
	CPAS - <i>Caulerpa pasploidis</i>	CPRO - <i>Caulerpa prolifera</i>	DSIM - <i>Digenia simplex</i>
	HINC - <i>Halimeda incrassata</i>	PCAP - <i>Penicillus capitatus</i>	PDUM - <i>Penicillus dumetosus</i>
	PPYR - <i>Penicillus pyriformis</i>	PVIC - <i>Padina vickersiae</i>	RPHO - <i>Rhizocephalus phoenix</i>
	SXXX - <i>Sargassum sp.</i>	UXXX - <i>Udotea spp.</i>	ULVA - <i>Ulva spp.</i>
	drift - drift algae	UNK - Unknown	

Abundance Codes:

1 - < 5% 2 - 5 to 25% 3 - 25 to 50% 4 - 50 to 75% 5 - 75 to 100%

Species	Abundance	Canopy (cm)				Comments:	SAV Coverage Values	
							Total	
		Epiphyte Density	Clean	Light	Moderate	Heavy		
		Sediment Type	Sand	Silt	Mud	Shell	Rock	

QUADRAT 2

Grasses:	HENG - <i>Halophila engelmannii</i>	HWRI - <i>Halodule wrightii</i>	RMAR - <i>Ruppia maritima</i>
	SFIL - <i>Syringodium filiforme</i>	TTES - <i>Thalassia testudium</i>	
Algae:	ACRE - <i>Acetabularia crenulata</i>	BOER - <i>Batophora oerstedii</i>	CASH - <i>Caulerpa ashmeadii</i>
	CCUP - <i>Caulerpa cupressoides</i>	CIST - <i>Codium isthmocladum</i>	CMEX - <i>Caulerpa mexicana</i>
	CPAS - <i>Caulerpa pasploidis</i>	CPRO - <i>Caulerpa prolifera</i>	DSIM - <i>Digenia simplex</i>
	HINC - <i>Halimeda incrassata</i>	PCAP - <i>Penicillus capitatus</i>	PDUM - <i>Penicillus dumetosus</i>
	PPYR - <i>Penicillus pyriformis</i>	PVIC - <i>Padina vickersiae</i>	RPHO - <i>Rhizocephalus phoenix</i>
	SXXX - <i>Sargassum sp.</i>	UXXX - <i>Udotea spp.</i>	ULVA - <i>Ulva spp.</i>
	drift - drift algae	UNK - Unknown	

Abundance Codes:

1 - < 5% 2 - 5 to 25% 3 - 25 to 50% 4 - 50 to 75% 5 - 75 to 100%

Species	Abundance	Canopy (cm)				Comments:	SAV Coverage Values	
							Total	
		Epiphyte Density	Clean	Light	Moderate	Heavy		
		Sediment Type	Sand	Silt	Mud	Shell	Rock	

QUADRAT 3										
Grasses:		HENG - <i>Halophila engelmannii</i>			HWRI - <i>Halodule wrightii</i>			RMAR - <i>Ruppia maritima</i>		
		SFIL - <i>Syringodium filiforme</i>			TTES - <i>Thalassia testudium</i>					
Algae:		ACRE - <i>Acetabularia crenulata</i>			BOER - <i>Batophora oerstedii</i>			CASH - <i>Caulerpa ashmeadii</i>		
		CCUP - <i>Caulerpa cupressoides</i>			CIST - <i>Codium isthmocladum</i>			CMEX - <i>Caulerpa mexicana</i>		
		CPAS - <i>Caulerpa pasploides</i>			CPRO - <i>Caulerpa prolifera</i>			DSIM - <i>Digenia simplex</i>		
		HINC - <i>Halimeda incrassata</i>			PCAP - <i>Penicillus capitatus</i>			PDUM - <i>Penicillus dumetosus</i>		
		PPYR - <i>Penicillus pyriformis</i>			PVIC - <i>Padina vickersiae</i>			RPHO - <i>Rhipocephalus phoenix</i>		
		SXXX - <i>Sargassum sp.</i>			UXXX - <i>Udotea spp.</i>			ULVA - <i>Ulva spp.</i>		
		drift - drift algae			UNK - Unknown					
Abundance Codes:										
	1 - < 5%	2 - 5 to 25%	3 - 25 to 50%	4 - 50 to 75%	5 - 75 to 100%					
Species	Abundance	Canopy (cm)			Comments:				SAV Coverage Values	
									Total	
									Grass	
									Algae	
									Urchins	
									Scallops	
									NGIQ	
									Drift	
		Epiphyte Density		Clean	Light	Moderate	Heavy			
		Sediment Type		Sand	Silt	Mud	Shell	Rock		

QUADRAT 4										
Grasses:		HENG - <i>Halophila engelmannii</i>			HWRI - <i>Halodule wrightii</i>			RMAR - <i>Ruppia maritima</i>		
		SFIL - <i>Syringodium filiforme</i>			TTES - <i>Thalassia testudium</i>					
Algae:		ACRE - <i>Acetabularia crenulata</i>			BOER - <i>Batophora oerstedii</i>			CASH - <i>Caulerpa ashmeadii</i>		
		CCUP - <i>Caulerpa cupressoides</i>			CIST - <i>Codium isthmocladum</i>			CMEX - <i>Caulerpa mexicana</i>		
		CPAS - <i>Caulerpa pasploides</i>			CPRO - <i>Caulerpa prolifera</i>			DSIM - <i>Digenia simplex</i>		
		HINC - <i>Halimeda incrassata</i>			PCAP - <i>Penicillus capitatus</i>			PDUM - <i>Penicillus dumetosus</i>		
		PPYR - <i>Penicillus pyriformis</i>			PVIC - <i>Padina vickersiae</i>			RPHO - <i>Rhipocephalus phoenix</i>		
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Abundance Codes:										
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Species	Abundance	Canopy (cm)			Comments:				SAV Coverage Values	
									Total	
									Grass	
									Algae	
									Urchins	
									Scallops	
									NGIQ	
									Drift	
		Epiphyte Density		Clean	Light	Moderate	Heavy			
		Sediment Type		Sand	Silt	Mud	Shell	Rock		