



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
1002 WEST 23RD STREET, SUITE 350
PANAMA CITY, FLORIDA 32405

March 27, 2017

REPLY TO
ATTENTION OF

Regulatory Division
North Permits Branch
Panama City Permits Section
SAJ-2017-00481(NW-LSL)

Ms. Savanna Barry
UF IFAS Nature Coast Biological Station
Post Office Box 878
552 1st Street
Cedar Key, Florida 32625

Mr. Joshua Patterson
University of Florida
Center for Conservation
529 Estuary Shore Lane
Apollo Beach, Florida 33572

Ladies and Gentlemen:

The U.S. Army Corps of Engineers (Corps) assigned your application for a Department of the Army permit, which the Corps received on February 6, 2017, the file number SAJ-2017-00481. A review of the information and drawings provided indicates that the proposed work would result in the restoration of 7.5 acres of seagrass meadows in the Big Bend region. Specifically, the proposed project is to install up to 50,240 cubic yards of encapsulated sediment, 528,000 nursery grown seagrass planting units and 300 temporary aids to navigation. Sediment tubes will be constructed and filled in an upland staging area. The tubes will be transferred to the restoration site via a shallow draft vessel. Each tube will be hand placed by a diver. Navigational aid buoys will be placed around damaged banks during scallop season. The buoys will be transferred to the staging area via shallow draft vessel and hand placed in an area devoid of marine resources. The project is located waterward of Wakulla, Jefferson, Taylor, Dixie, Levy, Citrus, and Hernando Counties in the Big Bend Seagrasses Aquatic Preserve and the St. Martin's Marsh Aquatic Preserve.

Your project, as depicted on the enclosed drawings, is authorized by Nationwide Permit (NWP) Number 27. In addition, project specific conditions have been enclosed. This verification is valid until **March 18, 2022**. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant nationwide permit is modified or revoked, you will have 12 months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this nationwide permit. Please access the U.S. Army Corps of Engineers' (Corps) Jacksonville District's Regulatory Internet page to access Internet links to view the Final Nationwide Permits, Federal Register Vol. 82, dated January 6, 2017, specifically pages 1983 to 2008, and the table of Regional Conditions. The Internet page address is:

<http://www.saj.usace.army.mil/Missions/Regulatory.aspx>

Please be aware this Internet address is case sensitive and should be entered as it appears above. Once there you will need to click on "Source Book"; and, then click on "Nationwide Permits." These files contain the description of the Nationwide Permit authorization, the Nationwide Permit general conditions, and the regional conditions, which apply specifically to this verification for NWP 27. Enclosed is a list of the six General Conditions, which apply to all Department of the Army authorizations. You must comply with all of the special and general conditions and any project specific condition of this authorization or you may be subject to enforcement action. In the event you have not completed construction of your project within the specified time limit, a separate application or re-verification may be required.

The following special conditions are included with this verification:

1. Reporting Address: The Permittee shall submit all reports, notifications, documentation and correspondence required by the general and special conditions of this permit to the following address:

a. For standard mail: U.S. Army Corps of Engineers, Regulatory Division, Special Projects and Enforcement Branch, 41 North Jefferson St., Suite 301, Pensacola, FL 32502.

b. For electronic mail: CESAJ-ComplyDocs@usace.army.mil (not to exceed 10 MB).

The Permittee shall reference this permit number, SAJ-2017-00481(NW - LSL), on all submittals.

2. Commencement Notification: Within 10 days from the date of initiating the work authorized by this permit, the Permittee shall provide a written notification of the date of commencement of authorized work to the Corps.

3. Self-Certification: Within 60 days of completion of the work authorized by this permit, the Permittee shall complete the "Self-Certification Statement of Compliance" form (Attachment A) and submit it to the Corps. In the event that the completed work deviates in any manner from the authorized work, the Permittee shall describe the deviations between the work authorized by this permit and the work as constructed on the "Self-Certification Statement of Compliance" form. The description of any deviations on the "Self-Certification Statement of Compliance" form does not constitute approval of any deviations by the Corps.

4. Agency Changes/Approvals: Should any other agency require and/or approve changes to the work authorized or obligated by this permit, the Permittee is advised a modification to this permit instrument is required prior to initiation of those changes. It is the Permittee's responsibility to request a modification of this permit from the Panama City Permits Section. The Corps reserves the right to fully evaluate, amend, and approve or deny the request for modification of this permit.

5. Assurance of Navigation and Maintenance: The Permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structures or work herein authorized, or if in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the Permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

6. Posting of Permit: The Permittee shall have available and maintain for review a copy of this permit and approved plans at the construction site.

7. Cultural Resources/Historic Properties:

a. No structure or work shall adversely affect impact or disturb properties listed in the *National Register of Historic Places* (NRHP) or those eligible for inclusion in the NRHP.

b. If during the ground disturbing activities and construction work within the permit area, there are archaeological/cultural materials encountered which were not the subject of a previous cultural resources assessment survey (and which shall include, but not be limited to: pottery, modified shell, flora, fauna, human remains, ceramics, stone tools or metal implements, dugout canoes, evidence of structures or any other physical remains that could be associated with Native American cultures or early colonial or American settlement), the Permittee shall immediately stop all work and ground-disturbing activities within a 100-meter diameter of the discovery and notify the Corps within the same business day (8 hours). The Corps shall then notify the Florida State Historic Preservation Officer (SHPO) and the appropriate Tribal Historic Preservation Officer(s) (THPO(s)) to assess the significance of the discovery and devise appropriate actions.

c. Additional cultural resources assessments may be required of the permit area in the case of unanticipated discoveries as referenced in accordance with the above Special Condition ; and if deemed necessary by the SHPO, THPO(s), or Corps, in

accordance with 36 CFR 800 or 33 CFR 325, Appendix C (5). Based, on the circumstances of the discovery, equity to all parties, and considerations of the public interest, the Corps may modify, suspend or revoke the permit in accordance with 33 CFR Part 325.7. Such activity shall not resume on non-federal lands without written authorization from the SHPO for finds under his or her jurisdiction, and from the Corps.

d. In the unlikely event that unmarked human remains are identified on non-federal lands, they will be treated in accordance with Section 872.05 Florida Statutes. All work and ground disturbing activities within a 100-meter diameter of the unmarked human remains shall immediately cease and the Permittee shall immediately notify the medical examiner, Corps, and State Archeologist within the same business day (8-hours). The Corps shall then notify the appropriate SHPO and THPO(s). Based, on the circumstances of the discovery, equity to all parties, and considerations of the public interest, the Corps may modify, suspend or revoke the permit in accordance with 33 CFR Part 325.7. Such activity shall not resume without written authorization from the State Archeologist and from the Corps.

7. Endangered Species: The permittee agrees to comply with all of the activity specific Project Design Criteria (PDCs) listed in the National Marine Fisheries Service's (NMFS) Statewide Programmatic Biological Opinion (SWPBO), dated December 4, 2015. Failure to comply with these conditions could result in enforcement action by the Corps and/or NMFS.

8. Manatee Conditions: The Permittee shall comply with the "Standard Manatee Conditions for In-Water Work – 2011" (Attachment B).

9. Sea Turtle and Smalltooth Sawfish Conditions: The Permittee shall comply with National Marine Fisheries Service's "Sea Turtle and Smalltooth Sawfish Construction Conditions" dated March 23, 2006, (Attachment C).

10. Species reporting: Any collision(s) with and/or injuries to any sea turtle, sawfish, whale, or sturgeon occurring during the construction of a project, shall be reported immediately to NMFS's Protected Resources Division (PRD) at (727-824-5312) or by email to takereport.nmfs@noaa.gov and CESAJ-ComplyDocs@usace.army.mil. Sea turtle and marine mammal stranding/rescue organizations' contact information is available by region at <http://www.nmfs.noaa.gov/pr/health/networks.htm>. Smalltooth sawfish encounters shall be reported to <http://www.flmnh.ufl.edu/fish/sharks/sawfish/sawfishencounters.html>.

*Failure to report take of a federally listed threatened or endangered species may lead to suspension, revocation, or modification of this authorization. (From Section 3(18) of the Federal Endangered Species Act: The term 'take' means to harass, harm, pursue,

hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.)

11. Marine Life Entrapment: Neither structure nor material or the method of construction shall pose more than minimal risk of entrapping fish, marine turtles, or marine mammals. In-water lines must be industrial grade metal or heavy cables that do not readily loop and tangle. All in-water lines (rope and cable) must be rigid and cannot have excess line in the water. Lines may be enclosed in a plastic or rubber sleeve/tube to add rigidity.

12. Temporary Exclusion Cages: In order to ensure the stability of new transplants, exclusion cages must be temporarily placed around new transplants for a maximum of 4 months to allow the seagrass beds to establish themselves to the point where they are sustainable after the cages are removed. Each exclusion cage must be securely fastened to the substrate so that it does not become detached. Cages must be constructed of firm, taut materials that cannot twist or become entangled.

This letter of authorization does not obviate the necessity to obtain any other Federal, State, or local permits, which may be required. Prior to the initiation of any construction, projects qualifying for this Nationwide permit must qualify for an exemption under section 403.813(1), Florida Statutes or 373.406, Florida Statutes, or otherwise be authorized by the applicable permit required under Part IV of Chapter 373, Florida Statutes, by the Department of Environmental Protection, a water management district under section 373.069, Florida Statutes, or a local government with delegated authority under section 373.441, Florida Statutes, and receive Water Quality Certification and applicable Coastal Zone Consistency Concurrence or waiver thereto, as well as any authorizations required for the use of state-owned submerged lands under Chapter 253, Florida Statutes, and, as applicable, Chapter 258, Florida Statutes. You should check State-permitting requirements with the Florida Department of Environmental Protection or the appropriate water management district.

This letter of authorization does not include conditions that would prevent the 'take' of a state-listed fish or wildlife species. These species are protected under sec. 379.411, Florida Statutes, and listed under Rule 68A-27, Florida Administrative Code. With regard to fish and wildlife species designated as species of special concern or threatened by the State of Florida, you are responsible for coordinating directly with the Florida Fish and Wildlife Conservation Commission (FWC). You can visit the FWC license and permitting webpage (<http://www.myfwc.com/license/wildlife/>) for more information, including a list of those fish and wildlife species designated as species of special concern or threatened. The Florida Natural Areas Inventory

(<http://www.fnai.org/>) also maintains updated lists, by county, of documented occurrences of those species.

This letter of authorization does not give absolute Federal authority to perform the work as specified on your application. The proposed work may be subject to local building restrictions mandated by the National Flood Insurance Program. You should contact your local office that issues building permits to determine if your site is located in a flood-prone area, and if you must comply with the local building requirements mandated by the National Flood Insurance Program.

If you are unable to access the internet or require a hardcopy of any of the conditions, limitations, or expiration date for the above referenced NWP, please contact me by telephone at 850-763-0717, extension 27.

Thank you for your cooperation with our permit program. The Corps Jacksonville District Regulatory Division is committed to improving service to our customers. We strive to perform our duty in a friendly and timely manner while working to preserve our environment. We invite you to complete our automated Customer Service Survey at http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey. Please be aware this Internet address is case sensitive; and, you will need to enter it exactly as it appears above. Your input is appreciated – favorable or otherwise.

Sincerely,

Lisa S. Lowvorn
Project Manager

Enclosures

Copy Furnished:
Carter Henne, Sea and Shoreline, LLC

GENERAL CONDITIONS
33 CFR PART 320-330

1. The time limit for completing the work authorized ends on **March 18, 2022**.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
4. If you sell the property associated with this permit you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.
5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.
6. You must allow a representative from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

DEPARTMENT OF THE ARMY PERMIT TRANSFER REQUEST

PERMIT NUMBER: SAJ-2017-00481(NW-LSL)

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. Although the construction period for works authorized by Department of the Army permits is finite, the permit itself, with its limitations, does not expire.

To validate the transfer of this permit and the associated responsibilities associated with compliance with its terms and conditions, have the transferee sign and date below and mail to the U.S. Army Corps of Engineers, Enforcement Section, Post Office Box 4970, Jacksonville, FL 32232-0019.

(TRANSFEREE-SIGNATURE)

(SUBDIVISION)

(DATE)

(LOT)

(BLOCK)

(NAME-PRINTED)

(STREET ADDRESS)

(MAILING ADDRESS)

(CITY, STATE, ZIP CODE)

SELF-CERTIFICATION STATEMENT OF COMPLIANCE

Permit Number: SAJ-2017-00481

Permittee's Name & Address (please print or type):

Ms. Savanna Barry
UF IFAS Nature Coast Biological Station
Post Office Box 878
552 1st Street
Cedar Key, Florida 32625

Mr. Joshua Patterson
University of Florida
Center for Conservation
529 Estuary Shore Lane
Apollo Beach, Florida 33572

Telephone Number: 352-543-1095 or 813-419-4917

Location of the Work: waterward of Wakulla, Jefferson, Taylor, Dixie, Levy, Citrus, and
Hernando Counties in Florida

Date Work Started: _____ Date Work Completed: _____

PROPERTY IS INACCESSIBLE WITHOUT PRIOR NOTIFICATION: YES _____ NO _____

**TO SCHEDULE AN INSPECTION PLEASE CONTACT _____
AT _____**

Description of the Work (e.g. bank stabilization, residential or commercial filling, docks,
dredging, etc.): restoration of seagrass meadows in the Big Bend region

Acreage or Square Feet of Impacts to Waters of the United States: 7.5 ac/50,240 CY

Describe Mitigation completed (if applicable): N/A

Describe any Deviations from Permit (attach drawing(s) depicting the deviations):

I certify that all work, and mitigation (if applicable) was done in accordance with the limitations
and conditions as described in the permit. Any deviations as described above are depicted on
the attached drawing(s).

Signature of Permittee

Date

2. Application Information

Name: Joshua Patterson, Ph.D. and Savanna Barry, Ph.D.

Address:

Joshua Patterson, Ph.D., 529 Estuary Lane, Apollo Beach, FL 33572

Savanna Barry, Ph.D., 552 1st Street, PO Box 878, Cedar Key, FL 32625

Phone Number: 813-419-4917 (Patterson), 352-543-1095 (Barry), 804-305-6014 (Barry Cell)

Email: joshpatterson@ufl.edu and savanna.barry@ufl.edu

Boundaries: All target locations are within Florida state waters adjacent to Wakulla, Jefferson, Taylor, Dixie, Levy, Citrus and Hernando Counties. Areas of special interest are within the Big Bend Seagrasses Aquatic Preserve and the St. Martin's Marsh Aquatic Preserve. See attached maps in Section 8.a.

3. Purpose:

An assessment of seagrass scarring conducted in 1995 identified areas of habitat that had been damaged to various degrees by vessels. It was recommended that action be taken in these areas to reduce and reverse damage. Additional studies in Florida suggest seagrass propeller scarring has increased markedly since the 1995 survey. It is the purpose of this project to protect and restore seagrass meadows that have been damaged by vessel groundings utilizing science-based technologies to actively restore 100 miles of prop scars in Florida's Big Bend region over a ten-year period.

4. Project Overview

Despite seagrass meadows providing highly valuable ecosystem services, seagrass meadows are declining both locally and globally. The reasons for seagrass meadow decline include development, water quality impairments, nutrient loading, and vessel groundings.

Prop scars are the most prolific type of vessel grounding. A prop scar is formed when a vessel transits in water depths to shallow to allow for the propeller avoid the bottom. The propulsion from the propeller dislodges sediment from the seagrass bed and creates a prop scar. A prop scar is a linear trench that inhibits seagrass from re-colonizing the area for up to 17 years or not at all. Prop scars through seagrass meadows are illegal to create, but difficult to enforce. Enforcement of individual prop scars is difficult because law officials are greatly outnumbered by recreational and commercial vessel traffic. The result is that many "orphan" prop scars are left behind. Propeller scar damage usually requires intervention with one or more restoration techniques to repair the prop scar and prevent expansion.

Seagrass restoration efforts should target areas with high prop scar density to achieve maximum benefit. However, prop scar maps were last completed for the Big Bend in 1995, well before the re-opening of the recreational scallop fishery. The popularity of recreational scalloping in this region has increased exponentially since re-opening in 2002. Interviews conducted in April 2016 with local natural

resource professionals indicated boaters encounter difficulties navigating in the shallow waters of Citrus County and generally lack awareness about the lasting ecological consequences of seagrass damage. Increasing boater awareness and improving aids to navigation have been identified as strategies that are likely to reduce seagrass damage in a cost-effective manner. We propose to address seagrass protection and restoration within the Big Bend by assessing temporal changes in scarring, restoring areas of existing damage and simultaneously increasing boater awareness of the issue to prevent occurrences of new damage.

The goals of this project will be achieved through the use of scientifically validated techniques. In addition, this restoration effort will increase the scientific understanding of seagrass restoration for the ecologically unique Big Bend.

Objectives:

- 1) Use existing high-resolution imagery collected in 2016 to update prop scarring maps for the Big Bend to identify target areas for restoration.
- 2) Implement prop scar restoration in scarring hotspots using proven techniques
- 3) Expand an existing boater education campaign and deploy in-water aids to navigation to protect restored areas

5. Regional Coverage

The Big Bend region of Florida harbors one of the largest contiguous seagrass beds in the United States, second only to Florida Bay in total seagrass acreage. The extensive seagrass beds of the Nature Coast provide critical habitat for juvenile reef fishes (e.g., groupers and snappers) that support valuable recreational and commercial fisheries throughout the Gulf, as well as vibrant inshore fisheries for finfish (red drum *Sciaenops ocellatus*, spotted seatrout *Cynoscion nebulosus*), crabs, and mollusks. Florida's tourism and fishing industries, in general, are heavily dependent on seagrass ecosystem services. Maintaining high quality natural resources is especially important in the rural counties of the Big Bend (Wakulla-Hernando) because these local economies are disproportionately dependent upon activities such as recreational and commercial fishing and wildlife viewing. The continued economic viability of the Big Bend counties is therefore at least in part dependent upon sustaining the bountiful seagrass resources that support vibrant commercial and recreational fisheries, manatees, shore and wading bird populations, and other coastal recreation draws. The importance of Gulf Coast seagrasses is recognized statewide and the creation of the St. Martin's March Aquatic Preserve and Big Bend Seagrasses Aquatic Preserve in 1969 and 1985 placed over 1,012,000 acres of aquatic habitat in the Big Bend under state management. Despite protection and management of seagrass resources in this and other parts of Florida, seagrasses in this region face multiple threats. The Florida Fish and Wildlife Conservation Commission name seagrasses as one of the most threatened marine habitats in Florida, with the highest ranked stressors being altered water quality, habitat destruction and sedimentation. Physical damage to seagrasses via propeller scarring and blow-holes from vessels running aground is an ongoing problem in Florida. Natural recovery from physical damage can exceed ten years. Over time, erosion and scouring in scarred areas can result in reduced resilience of the seagrasses to other stressors and lead to loss of vital

seagrass resources. Recent research off the Nature Coast indicates that increased nutrient loading in coastal rivers may threaten seagrass meadows. Coastal sedimentation due to an active forestry industry is also an ongoing regional concern. These and other stressors to seagrasses such as ocean warming, sea level rise, and food web effects from overfishing are complex issues that require long-term solutions and cooperation from multiple agencies and citizens. Propeller scarring, in contrast, is a wholly preventable stressor to seagrasses and reducing and reversing this impact can lead to increased seagrass resilience to other stressors, secure ecosystem services, and help improve the ecological sustainability of the tourism activities that are vital to the coastal counties in this region. We will target areas of seagrass impacted by propeller scars in seagrass beds off Wakulla, Jefferson, Taylor, Dixie, Levy, Citrus, and Hernando Counties. Scarred seagrass areas were mapped in 1995 and exist mostly on shallow banks around islands/keys and nearby navigational channels. More recent observations indicate that scarring has generally increased since 1995 and new areas of seagrass scarring have emerged, especially in the Big Bend Seagrasses Aquatic Preserve and St. Martin's Marsh Aquatic Preserve. New imagery obtained by the Florida Water Management Districts will be used to identify areas in the Big Bend region with the densest scarring, and these areas will be prioritized for propeller scar restoration.

6. Methodology

The goals of this project will be achieved by installing up to 50,240 cu yds of encapsulated sediment, 528,00 nursery grown seagrass planting units and 300 temporary aids to navigation over a ten-year period.

6.a Public Awareness

An increasing number of boaters in Florida means that pressure on seagrasses from physical damage in the Big Bend region could increase. The majority of seagrass scars occur because of poor boater navigation skills, poor marking of navigational channels, intentional use of short cuts, and attempting to get a boat on plane in shallow water or power out after running aground. Increased boater education and improvements to navigational aids are needed to address the potential for increased seagrass damage. A recent survey revealed that 35–40% of boaters visiting the Big Bend are unaware of propeller scarring or its harmful effects. Boater education and prevention of seagrass damage through improved aids to navigation (i.e., shallow seagrass marker buoys) are the most cost-effective route to preserving seagrass ecosystem services. Signage at boat launch points will remind boaters of the importance of seagrass resources for recreational angling and illustrate the procedures for transiting in shallow seagrass areas (i.e., troll or pole to deeper water before engaging motor). Boaters will be educated about the importance of seagrass resources through informational handouts and through a website (<http://beseagrasssafe.com>). Informational displays at public festivals throughout the region and brochure kiosks at boat launch points will serve to disseminate information about the importance of preventing seagrass scarring. In addition, shallow seagrass marker buoys will be deployed around scarring hotspots restored as part of this project to warn boaters and help prevent damage to restored areas in the future. These buoys will serve as improved aids to navigation and will help boaters avoid running aground or cutting a scar in seagrass meadows.

6.b Selection Criterion Identification

Prop scars are typically present in shallow water. This project will specifically focus on prop scars that are located within 1 to 7 feet of water based on mean low low water. Prop scars identified for restoration shall be analyzed to identify the correct treatment. Prop scar dimensions will be first measured for length, width, and depth. A 0.0003 cuyd sediment sample will be obtained from the area. The sediment sample will be analyzed at a University of Florida laboratory. The analysis will evaluate sediment composition, nutrient content and sieve size.

Prop scars that have a “high impact” after restoration will be preferred for restoration. Prop scars will be considered high impact if they have high probability of additional erosion, threatening surrounding seagrass meadows, or have a high probability of a slow recovery time. High impact prop scars that typically continue to erode are; parallel to the dominant current, high energy exposure, the prop scar trench is deeper than surrounding seagrass rhizomes, or near the outside perimeter of a seagrass meadow. High impact prop scars having long recovery time tendencies exhibit traits of; dominant surrounding seagrass species, inorganic or organic fine grain sediments, or sediments with low or bio-unavailable nutrient content.

6.c Sediment Tube Construction

To ensure a consistent high quality product, sediment tubes are fabricated using materials sourced from textile mills using materials that are free from residual chemical, dyes, and other harmful treatments. The sediment tube is double stitched 100% organic cotton. The tight weaved fabric does not allow sediments to escape the bag during the installation process, and thus does not create the turbidity plume that is created when installing burlap bags. The dimensions of the cylindrical shaped sediment tube are: L=1 meter, D= 20cm, V= 0.314 cuyds. The open end of the sediment tube is cinched tight with a jute string once filled.

6.d Filling Sediment Tubes

Sediment tubes filled with sediment that is similar in composition to the surrounding seagrass meadow as identified in the 6.b sediment analysis. Sediment tubes are filled and palletized on land by hand with the assistance of a hydraulic hopper. The clean sediment used to fill the sediment tubes is loaded into a 3 cuyd hopper with the assistance of ½ cuyd tractor. To prevent clumping the sediment inside the hopper is churned with a hydraulic auger. The hydraulic auger is powered by a 5 hp commercial grade motor that is located behind the hopper. The churned sediment is then gravity fed into “shoots” on the bottom of the hopper. The free falling sediment is then collected into a sediment tube. The sediment tube is filled and packed. The filling manager will inspect the sediment tubes to ensure that they are completely filled and devoid of air pockets. The sediment tube filling process will be performed at an upland staging area. At no time will the stockpiled material be staged in a wetland. Sediment size and nutrient composition used for filling the sediment tubes will vary depending on the results of the selection criteria analysis. Fill material will be similar to the adjacent seagrass meadow and will not vary more than 5% in composition.

6.e Delivery

The palletized sediment tubes will be loaded onto shallow draft vessels at a public boat launch or commercial marina. Proximity to the restoration site and deep water access will be the primary factor when determining which restoration site will be chosen. Shallow draft vessels will deliver the sediment tubes to the restoration site. While in transit vessels shall remain, at a minimum, at a water depth of no shallower than two feet.

6.f Installation

Once the restoration site the prop scar will be surveyed prior to installation of any sediment tubes. The diver will ensure that no marine resource has recruited into the prop scar. After completion of the final swim sediment tubes will be placed into the prop scar. Sediment tubes will only be offloaded from the vessel by hand. A crew member will lift a single sediment tube and hand it to a diver. The diver will swim to the prop scar and place it into the trench. The sediment tubes will be placed end to end ensuring that no gaps are left behind in the scar. The installed sediment tube will be flush with the surrounding seagrass meadow and will not impede navigation.

6.g Seagrass Planting

Prop scar recovery time will be decreased with the aid of seagrass planting units. Seagrass will be grown at the Sea and Shoreline llc. permitted upland aquaculture facility. Cultivated seagrass will be packaged into Jeb Planting units. The Jeb planting units will be delivered to the restoration site and installed into the sediment tubes. A diver will install the individual Jeb units at 1ft on center intervals. GrowSAV Herbivory exclusion devices will be placed at a maximum of 15% of the seagrass planting units. The dimensions of the GrowSAV Herbivory Exclusion Devices will be fabricated to a size appropriate for the site conditions. At a maximum the GrowSAV Herbivory Exclusion Device will be 24 inches tall and 36 inches in diameter. The GrowSAV Herbivory Exclusion Device will be constructed with a 3/8" metal frame and pvc coated 1" wire mesh. The mesh will be securely fastened to the frame using stainless steel D-Rings all the way around the bottom of where the mesh adheres to the frame. The GrowSAV Herbivory Exclusion Devices are anchored to the substrate with the use of a metal spike that penetrates through the GrowSAV Herbivory Exclusion Device into the substrate. The GrowSAV Herbivory Exclusion Devices have been extensively used, without any negative wildlife impacts, in the Caloosahatchee River, Crystal River, and the Banana River. The GrowSAV Herbivory Exclusion Device will be placed at a minimum of 15 ft on center so that wildlife movements are not disrupted. The GrowSAV Herbivory Exclusion Devices will be removed within four months of installation. In addition to the surrounding aids to navigation, GrowSAV Herbivory Exclusion Devices will be marked individually with a 3/4" PVC pipe that will extend at a minimum 5 ft in the air. The PVC pipe will be removed once the GrowSAV Herbivory Exclusion Device is removed.

6.h Navigational Aid Description

Navigational aid buoys will be placed around damaged banks during scallop season. The buoy assembly will be fabricated at an upland workshop. To alert boaters to shallow seagrass the buoys will have 3" tall reflective letters that read "Caution Seagrass Area". The buoy will be attached to the bottom with a 100 lbs concrete weight. The weight will be attached to the buoy with a 1/4 inch steel cable.

6.i Navigational Aid Installation

The pre-constructed buoys will be loaded onto a transport vessel at the staging area. The Buoys will then be delivered to the project location in a shallow draft vessel. While in transit vessels shall remain, at a minimum, at a water depth of no shallower than two feet. Once onsite a biologist will locate an exact location that is devoid of a marine resource including seagrass, sponge, oysters or hard bottom. The buoy assembly will then be placed on the location that the biologist identified as having no marine resource.

6.j Monitoring and Reporting

Once a prop scar is restored an As-Built/Time Zero report will be generated and submitted to the regulatory agencies. This report will document location of the restored prop scar, dimensions, and quantity of sediment tubes used to restore the prop scar. The As-built report will be submitted within thirty days of restoration activities occurring. Restored prop scars will be monitored annually for three years by a field scientist. A field biologist will survey five stations inside and five reference stations adjacent to the prop scar. The monitoring events will occur within seagrass monitoring season. A photograph will be taken at each station visited. Each monitoring station will be surveyed using a 0.25-meter quadrat to observe for percent cover, and a 0.1-meter quadrat will be used to count short shoots. Field data reports will be generated and presented after each monitoring event. A total of four reports will be generated the Time Zero taken immediately after, year 1, year 2, and year 3. **It is anticipated that prop scars will be restored in “sets” as funding becomes available. When multiple prop scars are restored within the timeframe of this permit the individual sets of prop scars will be monitored as previously described. Multiple As-built maps and subsequent monitoring reports will be generated for individual sets of prop scars. For instance, if 2 miles of prop scars are restored with grant funding, in year 1, then as-builts and subsequent monitoring reports will be generated for the 2 miles restored at that time. As additional funding becomes available and new prop scars are restored, new as-built maps and subsequent 3 years of monitoring reports will be generated. The maps and data will be provided to the appropriate regulatory agencies in one comprehensive report annually. The comprehensive report will detail all individual as-built maps and monitoring reports, and detail when the prop scar was restored. The data and maps will be organized to clearly depict the individual sets of monitoring reports based on when the set of prop scars were restored. When a series of scars have been monitored for three years then that set of prop scars will not be monitored in the future (post 4 years). In closing it is anticipated that a total of up to 13 monitoring reports may be submitted to the appropriate regulatory agencies.**

7. Summary

In summary this ten-year restoration project will increase seagrass protection through awareness and active restoration. This project is not likely to adversely affect the endemic protected species that utilize the restored seagrass restoration sites because of the timing of the proposed activities and methodologies utilized during installation. All work will comply with the “Standard Manatee Conditions for In-Water Work” dated in 2011. All work would abide by “Sea Turtle and Smalltooth Sawfish Construction Conditions” dated March 23, 2006. All work will be performed during daylight hours.

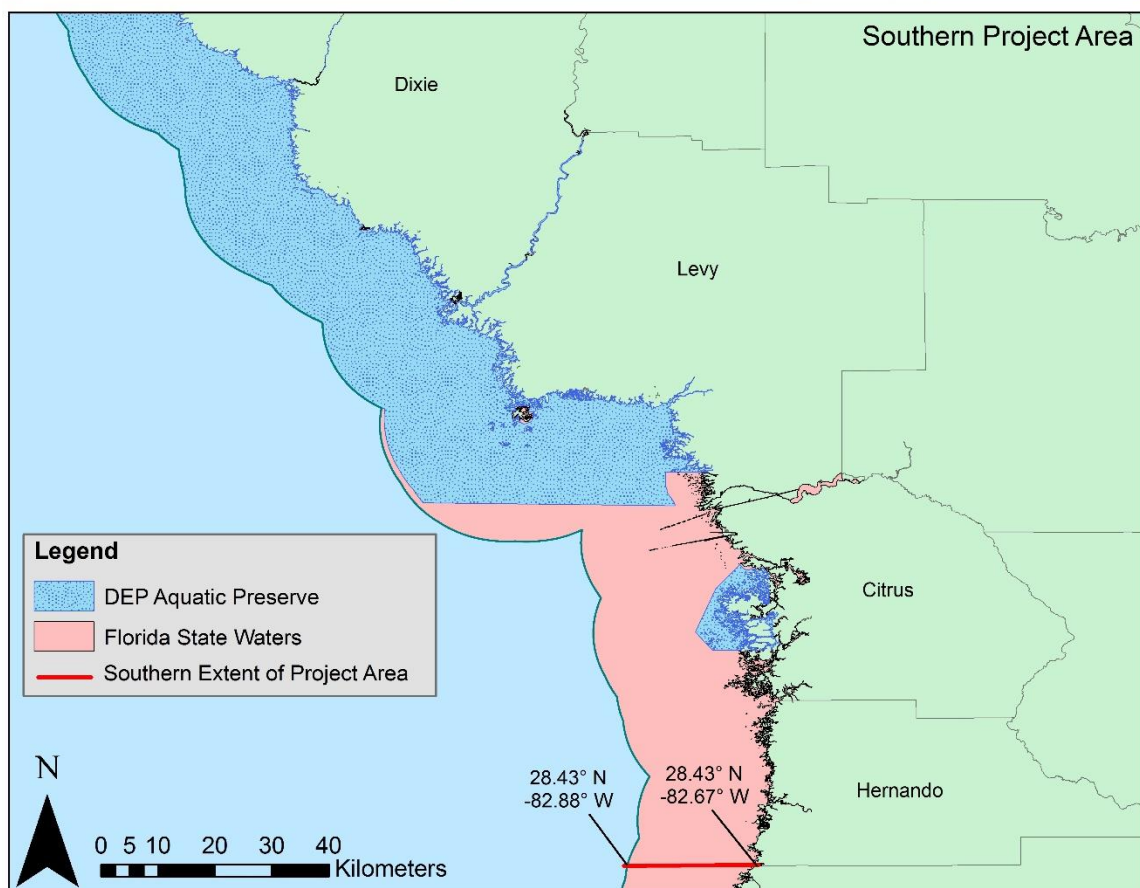
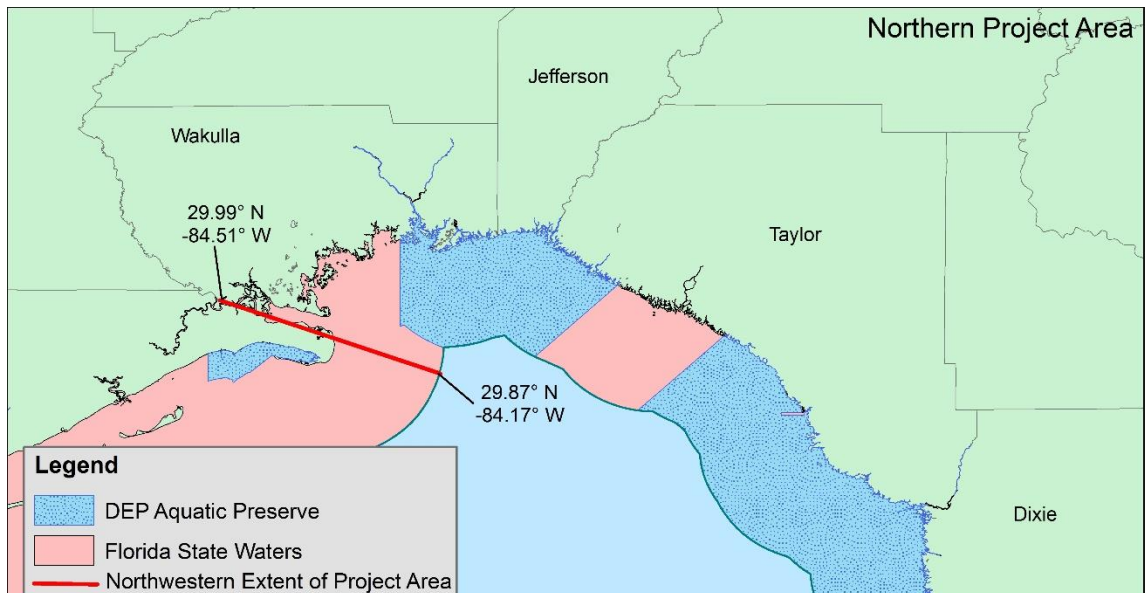
The proposed buoys would be placed seasonally, from May to September each year, to bracket recreational scallop season and peak recreational boating months. We will be monitoring the effectiveness of these buoys by quantifying boater behavior around the buoys. The buoys are not likely to affect manatees because they will be removed during prior to manatee seasonal migrations and the weight of the cable is such that it will **not** form loose coils that would ensnare a manatee.

Hand placement of the sediment tubes into the prop scar, and a biological assessment immediately prior to restoration, will ensure that no marine resource will be buried with sediment. Sediment tubes will not present a hazard to navigation, as the tubes will be placed such that the top of the tube is even with the surrounding substrate and not protruding above the bottom in any way (see 8.f).

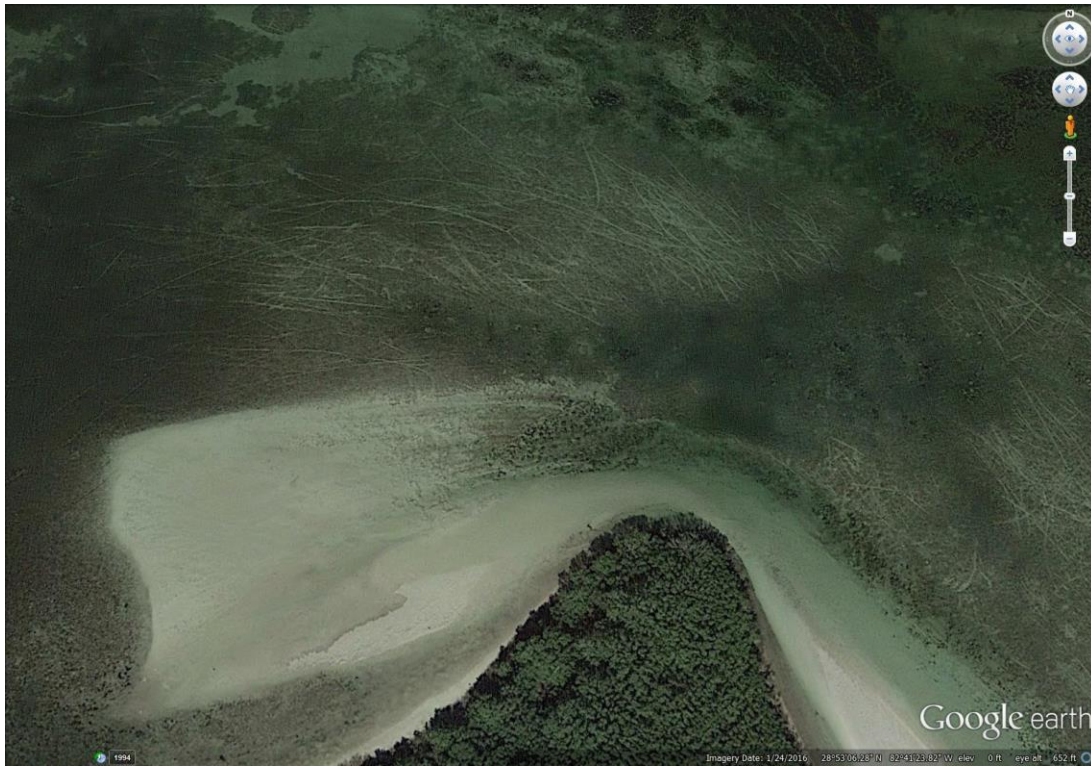
Seagrass planting units will be nursery grown at a registered aquaculture nursery to ensure that wild seagrass populations are not degraded. Seagrass planting stock will be derived from locally sourced seagrass wrack obtained from the same watershed as the restoration site. Seagrass mother stock will be obtained by collecting floating wrack that has washed on shore. The wrack collection activities will be pre-permitted prior any mother planting stock being collected.

8. Maps and Figures

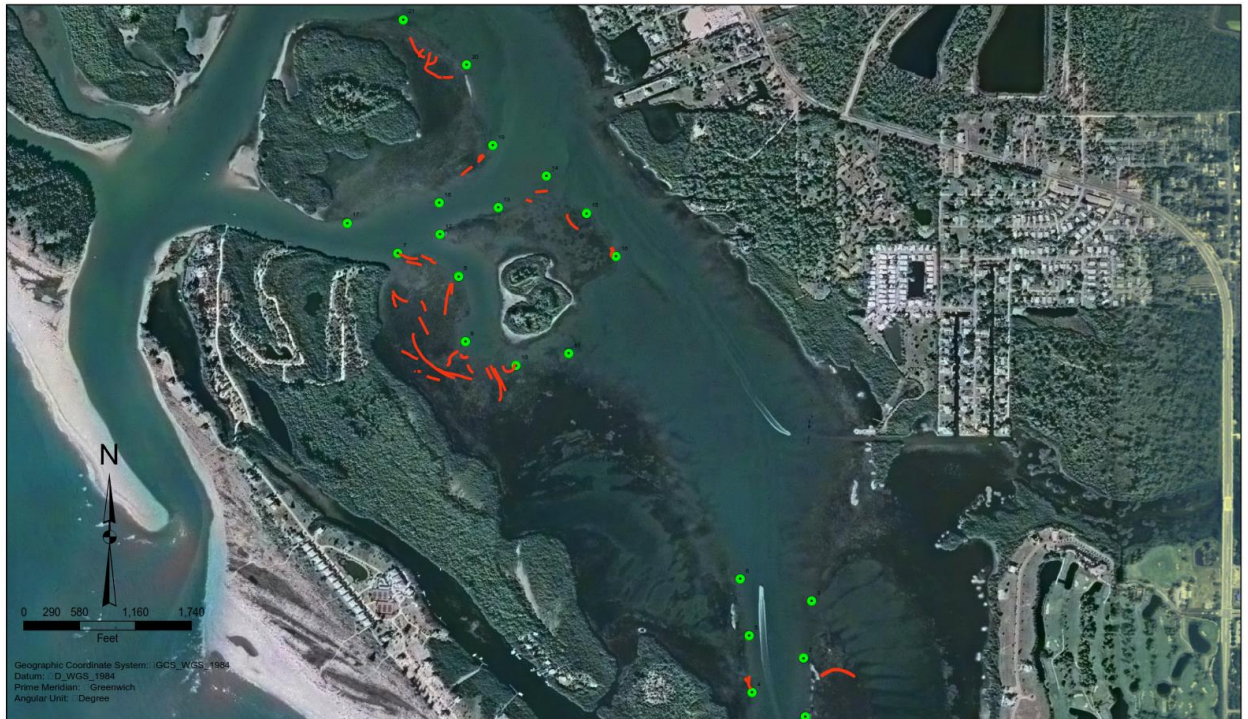
8.a Restoration Boundaries



8.b Example of Damaged Seagrass Meadow

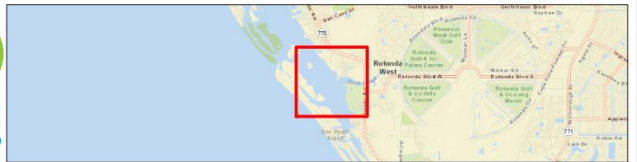


8.c Example As-Built Restoration Map



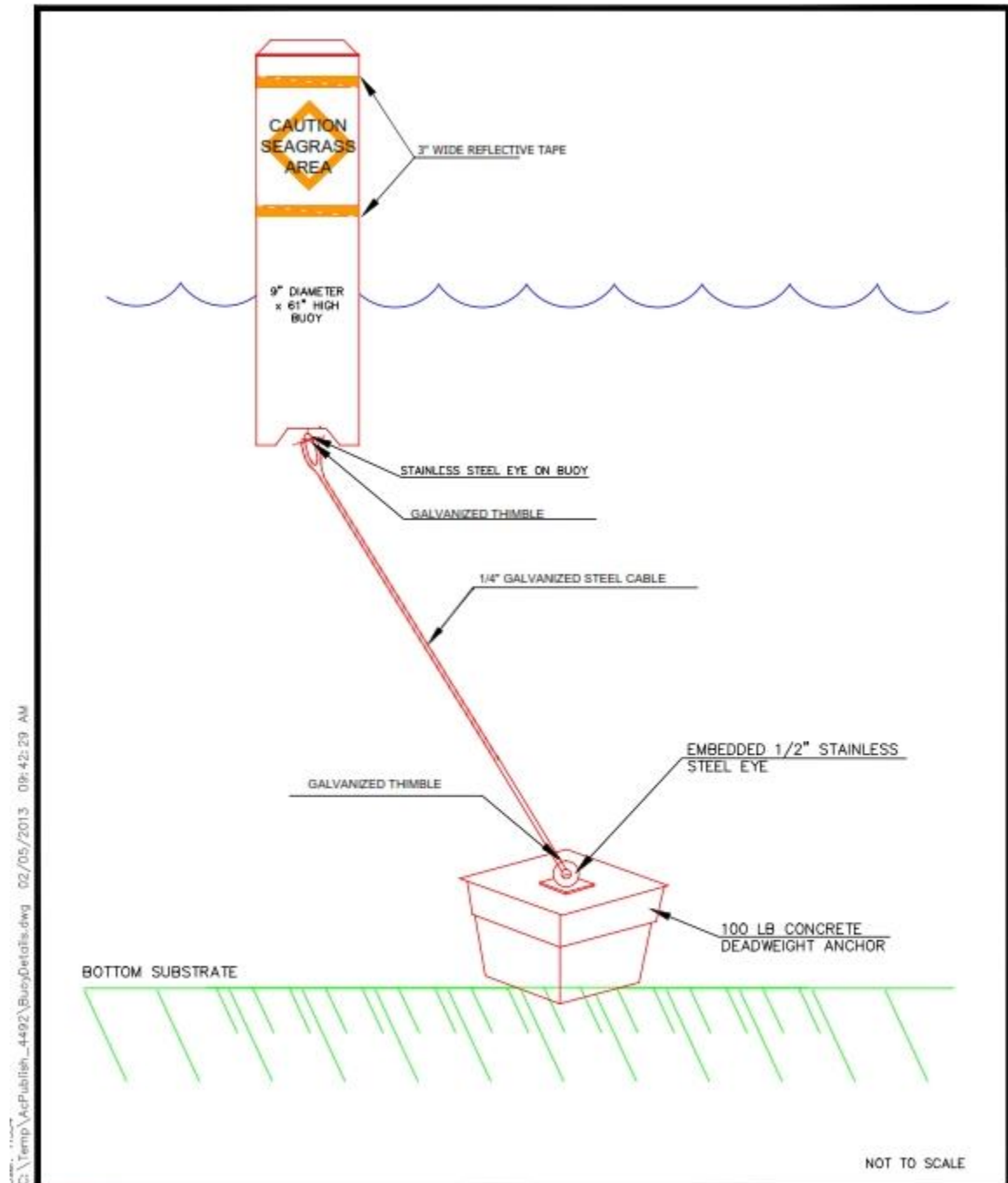
Legend Total Restoration Area 7,560.09 sq ft

- Lemon Bay Scars (7560.09 sq ft)
- Buoys (21)
- World Imagery



CHKD- BW	APPRVD- BW/CH	SHEET 1 OF 1	
DATE-050214	GIS DWG NO - 001	DRAWN - BIO GIS ANALYST	FILE NAME NO. - Lemon Bay Scars & Blowholes Restoration

8.d Buoy Diagram



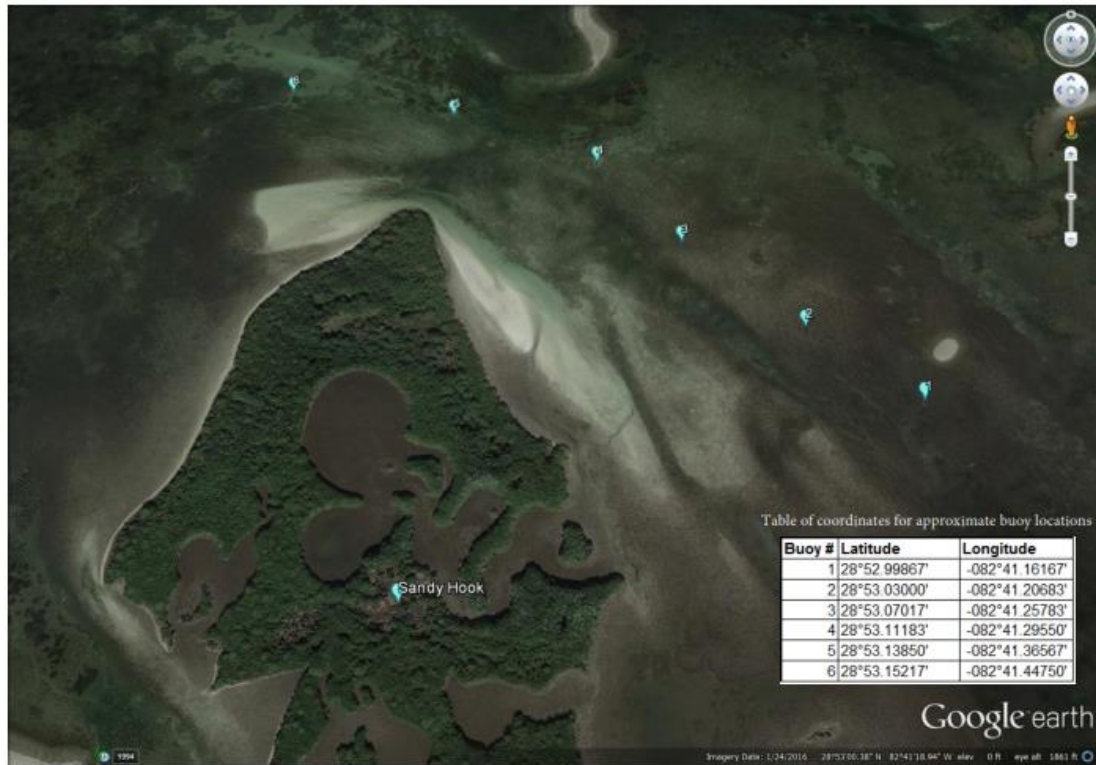
C:\Temp\AcPublish_4492\BuoyDetails.dwg 02/05/2013 09:42:29 AM



Waterway Marker
Construction Service
Uniform Waterway Marker Details

"Traditional"
Buoy Mooring System
Stainless Steel Chain

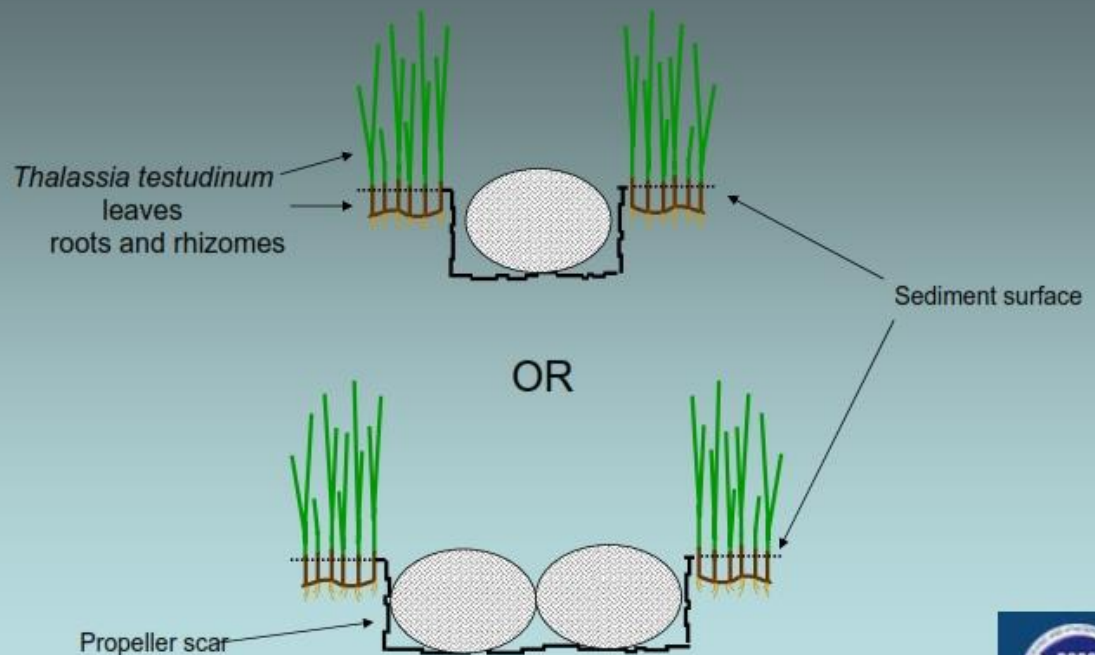
8.e Example of Buoy As-Built



Site plan overview for proposed buoy installation around north and east of Sandy Hook key, Crystal River shallow seagrass area.

8.f Prop Scar Profile

Cross-sectional view of deployment of sediment tubes into existing propeller scars. Depending on the width of the scars at the selected field site, tubes might be deployed side by side.



9. Pictures

9.a1 Sediment Tube Filling



9.a2 Sediment Tube Filling with Hydraulic Hopper



9.a3 Loading Sediment Tubes onto Shallow Draft Barge



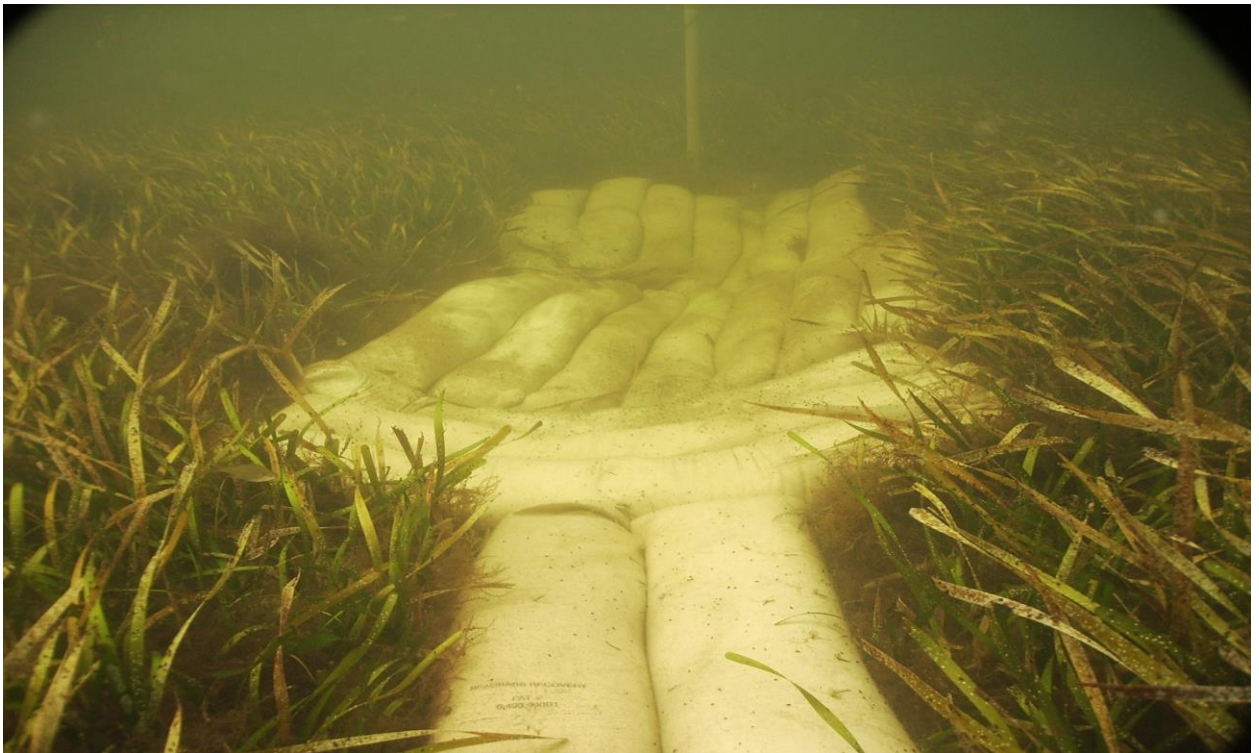
9.b Vessel Loaded with Sediment Tubes



9.c Sediment Tube Installation



9.d Installed Sediment Tube (Time Zero)



9.e Installed Sediment Tube (Post 6 months)



9.f Jeb Planting Unit



9.g Tray of Nursery Grown Jeb Units



9.h Planted Sediment Tube



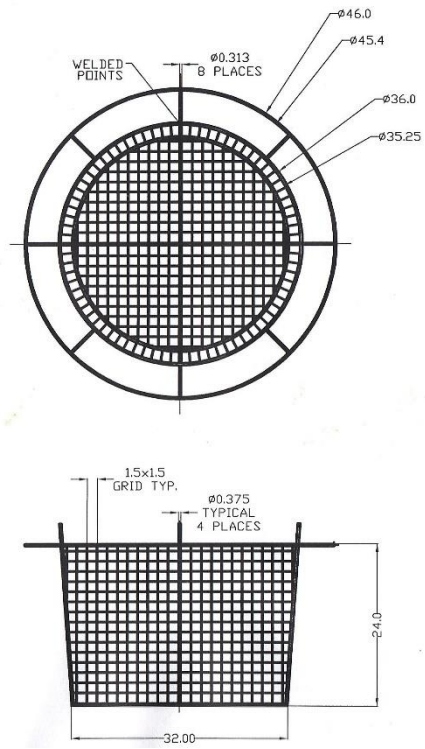
9.1 Mapping Planted Prop Scar for As-Built



9.J GrowSAV Herbivory Exclusion Device in Crystal River/Hunter Springs ,Fl.



9.K GrowSAV Herbivory Exclusion Device Plain View



STANDARD MANATEE CONDITIONS FOR IN-WATER WORK

2011

The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

- a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.
- b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
- c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.
- d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.
- e. Any collision with or injury to a manatee shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or in Vero Beach (1-772-562-3909) for south Florida, and emailed to FWC at ImperiledSpecies@myFWC.com.
- f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Temporary signs that have already been approved for this use by the FWC must be used. One sign which reads *Caution: Boaters* must be posted. A second sign measuring at least 8½ " by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. These signs can be viewed at http://www.myfwc.com/WILDLIFEHABITATS/manatee_sign_vendors.htm. Questions concerning these signs can be forwarded to the email address listed above.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701

SEA TURTLE AND SMALLTOOTH SAWFISH CONSTRUCTION CONDITIONS

The permittee shall comply with the following protected species construction conditions:

- a. The permittee shall instruct all personnel associated with the project of the potential presence of these species and the need to avoid collisions with sea turtles and smalltooth sawfish. All construction personnel are responsible for observing water-related activities for the presence of these species.
- b. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing sea turtles or smalltooth sawfish, which are protected under the Endangered Species Act of 1973.
- c. Siltation barriers shall be made of material in which a sea turtle or smalltooth sawfish cannot become entangled, be properly secured, and be regularly monitored to avoid protected species entrapment. Barriers may not block sea turtle or smalltooth sawfish entry to or exit from designated critical habitat without prior agreement from the National Marine Fisheries Service's Protected Resources Division, St. Petersburg, Florida.
- d. All vessels associated with the construction project shall operate at "no wake/idle" speeds at all times while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will preferentially follow deep-water routes (e.g., marked channels) whenever possible.
- e. If a sea turtle or smalltooth sawfish is seen within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 feet of a sea turtle or smalltooth sawfish. Operation of any mechanical construction equipment shall cease immediately if a sea turtle or smalltooth sawfish is seen within a 50-ft radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition.
- f. Any collision with and/or injury to a sea turtle or smalltooth sawfish shall be reported immediately to the National Marine Fisheries Service's Protected Resources Division (727-824-5312) and the local authorized sea turtle stranding/rescue organization.
- g. Any special construction conditions, required of your specific project, outside these general conditions, if applicable, will be addressed in the primary consultation.

Revised: March 23, 2006

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