

ATTACHMENT NO. 37-1

**LIDO KEY HURRICANE AND STORM DAMAGE REDUCTION PROJECT
SEAGRASS MITIGATION AND MONITORING PLAN**

**LIDO KEY HURRICANE AND STORM DAMAGE REDUCTION PROJECT
SEAGRASS MITIGATION AND MONITORING PLAN
SARASOTA COUNTY, FLORIDA**

FDEP PERMIT NO. 0333315-001-JC

Permittees:

U.S. Army Corps of Engineers
Jacksonville District
701 San Marco Blvd.
Jacksonville, Florida 32207

City of Sarasota
1565 First Street, Room 100A
Sarasota, Florida 34263

JULY 2016

**LIDO KEY HURRICANE AND STORM DAMAGE REDUCTION PROJECT
SEAGRASS MITIGATION AND MONITORING PLAN
SARASOTA COUNTY, FLORIDA**

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APPENDICES

A	UMAM Evaluation
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1.0 INTRODUCTION

The federally-authorized Lido Key Hurricane and Storm Damage Reduction (HSDR) Project includes beach nourishment on Lido Key using sediment from the two adjacent passes and the construction of two groins to stabilize the southern shoreline. Big Sarasota Pass is designated as the primary and initial sand source under FDEP Permit No. 0333315-001-JC. New Pass may be used (under FDEP Permit No. 0039755-003-JC) as a supplemental sand source, subject to the sand sharing agreement between the City of Sarasota and the Town of Longboat Key.

The Lido Key HSDR Project consists of the placement of sand along a 1.6 mile segment of the Lido Key coastline between FDEP monuments R-34.5 and R-44. The Big Sarasota Pass borrow area design includes three cuts labeled B, C and D (Figure 1), with Borrow Areas B and C proposed as the initial sediment sources. A September 2014 benthic resource investigation documented a total of 5.71 acres of seagrass, including 1.68 acres inside the borrow area boundaries and 4.03 acres identified within 150 m of the borrow areas (CB&I, 2014). No seagrass was observed within the fill placement area or the associated fill placement area mixing zone.

Based on coordination with FDEP, up front mitigation is required for direct impacts to seagrass within the borrow areas. Section 2.0 describes the proposed mitigation to offset these impacts. In addition to the proposed mitigation for direct impacts and associated mitigation monitoring, monitoring will be conducted outside of the borrow areas to determine if any secondary (indirect) impacts to seagrasses occur as a result of the construction of the Lido HSDR project. Section 3.0 describes the proposed secondary impact monitoring protocol.

2.0 SEAGRASS MITIGATION PLAN

Dredging of Borrow Areas B, C, and D as part of the Lido Key HSDR Project may result in unavoidable direct impacts to seagrass resources located within the borrow areas (Figure 1). This mitigation plan describes proposed compensatory mitigation to replace local seagrass functions and values.

2.1 MITIGATION REQUIREMENTS

Seagrass communities observed within the borrow areas in 2014 totaled 1.68 acres of *Halodule wrightii* (shoal grass) with less than 5% cover within each delineated patch (CB&I, 2014). As mitigation for direct impacts to these seagrass resources, creation of 2.8 acres of seagrass habitat within the Perico Preserve Seagrass Basin, Manatee County, Florida, is proposed (Figure 2). A Uniform Mitigation Assessment Methodology (UMAM, 62-345 F.A.C.) evaluation (provided as Appendix A) was conducted to determine the functional loss of seagrass within the borrow areas and the functional gain achieved from the seagrass creation within the Perico Preserve Seagrass Basin. The ERP No. 43040091.003 (issued November 4, 2013) for Manatee County's Rookery at Perico Seagrass Advance Mitigation addressed future mitigation credits anticipated to be generated by the project by establishing a UMAM baseline mitigation condition for Location/Landscape, Water Environment and Community Structure as "zero" for the created seagrass basin, pursuant to 62-345, F.A.C.. Therefore, the UMAM evaluation conducted for this project used a baseline mitigation condition of zero for all categories (Appendix A).

UMAM determined that 2.8 acres of mitigation would be required to offset the permanent loss (removal) of the 1.68 acres of seagrass delineated in the Big Sarasota Pass borrow areas. While the Perico Preserve Seagrass Basin was designed to facilitate natural recruitment of seagrass from Perico Bayou, the proposed mitigation for the Lido Key HSDR Project will include planting

seagrass to reduce time lag and risk of mitigation success. Planting units of *H. wrightii* will be harvested from the proposed seagrass donor area in Perico Bayou, located adjacent to the mitigation site (Figure 2). Due to the suitable depth, the tidal connection to Perico Bayou, and the observations of early natural recruitment to the site, the mitigation site is anticipated to resemble the seagrass community located in the adjacent Perico Bayou (donor) site within five years following planting. Planting in the Perico Preserve Seagrass Basin is planned to occur before construction of the Lido Key HSDR; therefore, mitigation will be in place before the seagrass resources in the borrow areas are impacted by dredging in Big Sarasota Pass.

G:\Enterprise\Sarasota\150252_Lido Key Storm Damage Reduction Project Permitting\MXD\Cop of Historical Seagrass Without Mitigation Area 060216.mxd



Notes:

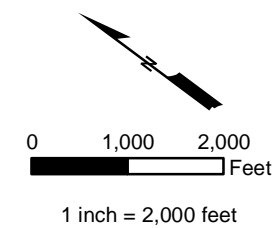
1. Coordinates are in feet based on the Florida State Plane Coordinate System, West Zone, North American Datum of 1983 (NAD 83).
2. Lido Key aerial photography provided by Aerial Cartographics of America, date flown August 10, 2014.
3. Additional background imagery is ESRI's Imagery Basemap.

Legend:

- Outstanding Florida Waters
- Borrow Areas (B,C,D)
- Beach Design
- Monitoring Area (150m)
- FDEP Monuments

Seagrass Data:

- CB&I, 2014
- SWFWMD, 2012
- Continuous
- Discontinuous
- Dial Cordy, 2001



TITLE:

Lido Key, Sarasota County Florida Hurricane and Storm Damage Reduction Project Seagrass Resources



**CB&I
Environmental & Infrastructure, Inc.**

2481 N. W. Boca Raton Boulevard
Boca Raton, FL 33431
Ph. (561) 391-8102
Fax (561) 391-9116

Date: 06/02/16

By: HMV

Comm No. : 150252

Figure No. 1



Figure 2. Perico Preserve Seagrass Basin and Donor Site (from Stantec, 2013a).

2.2 MITIGATION SITE - PERICO PRESERVE SEAGRASS BASIN

In 2013, as part of their Perico Preserve restoration, Manatee County began the excavation of a 16.4 acre basin with the intended goal of establishing a 12.25 acre tidal basin dominated by seagrass. This basin was excavated from fallow farm fields and a tidal connection to Perico Bayou was established in September 2015 through the excavation of two flushing channels. The basin was designed to facilitate seagrass recruitment from the adjacent seagrass beds in Perico Bayou into the restoration site. To maximize the probability that suitable seagrass growing conditions would be established, the basin was designed to replicate the conditions (e.g. temperature, salinity, and tide range) within the adjacent portion of Perico Bayou where there exists healthy, continuous seagrass cover by *Halodule wrightii* (shoal grass) and *Thalassia testudinum* (turtle grass). A numerical modeling study was conducted to facilitate the design of the seagrass basin, with a focus on a tidal exchange analysis (CPE, 2012). The basin and the channels were established to a depth of -2 feet NAVD, which was identified as a suitable depth for seagrass establishment based on the presence of healthy, continuous seagrass cover at this elevation within Perico Bayou. The seagrass creation area totals 12.21 acres, corresponding to the area encompassing the elevation range of -1.5 feet NAVD to -2.0 feet NAVD. Also included is the area at elevation -2.7 feet NAVD that encircles the Rookery Island (Stantec, 2013a). There is no dedicated access to the seagrass basin and boardwalks going over the flushing cuts to Perico Bayou were designed to exclude motorized vessels by height.

Since connection of the basin to Perico Bayou in September 2015, there have been observations of natural recruitment of seagrasses. A known ephemeral species, *Ruppia maritima* (widgeon grass) had become well established in the basin before it was connected to tidal waters and was still found within the basin during inspections that occurred in April and May of 2016. Less commonly observed than *R. maritima*, at less than one percent total cover in April and May of 2016, was naturally recruiting *H. wrightii*. While in its early stages of establishment, the presence of this species scattered throughout the basin is a very encouraging sign of the site's ability to support seagrasses into the future. Furthermore, several live rhizomes of *T. testudinum* have been observed floating into the basin, and two rhizomes with live apical meristems that were buried by County staff in April 2016 were still alive a month later, but had not yet shown any signs of growth (Moore, pers. comm., 2016).

The Perico Preserve Seagrass Basin is proposed as a suitable mitigation site for the Lido HSDR Project for several reasons:

- The mitigation site and impact site are located in the same Sarasota Bay watershed, as confirmed by FDEP (Edwards, pers. comm., 2016).
- The mitigation site is connected to an area in Perico Bayou that already supports extensive seagrass beds, composed primarily of *Halodule wrightii* and *Thalassia testudinum* (Stantec, 2013b).
- Depths of the seagrass creation area and flushing channels match those of the adjacent Perico Bayou seagrass beds.
- The adjacent seagrass beds in Perico Bayou will provide sufficient donor material for planting of the mitigation site, and will be a source of natural recruitment to the site.
- Boats are excluded from the seagrass creation area by the low elevation of the boardwalk over the two flushing channels.

An interagency Perico Preserve site visit was conducted on May 12, 2016, including representatives from Manatee County, National Marine Fisheries Service, Habitat Conservation

Division (NMFS-HCD), U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Service (USFWS). The purpose of the inspection was to allow agency staff to observe conditions at the proposed mitigation and donor sites to help determine the suitability of this site to provide mitigation for unavoidable seagrass impacts from the Lido Key HSDR Project. Based on this site visit, it was agreed that the Perico Preserve Seagrass Basin is a viable mitigation site for the Lido Key HSDR Project (CB&I, 2016). A representative from Florida Fish and Wildlife Conservation Commission (FWC) also visited the site on his own and agreed that this site was a good mitigation option (Davis, pers. comm., 2016).

2.3 SEAGRASS CREATION PLAN

The first stages of the seagrass creation plan have already been completed by Manatee County through excavation of the basin from fallow farm fields and establishment of a tidal connection to Perico Bayou. While the Perico Preserve Seagrass Basin was designed to facilitate natural recruitment of seagrass from Perico Bayou, the proposed Lido Key HSDR Project mitigation will include planting seagrass at this site to augment the natural recruitment process, thereby reducing mitigation time lag and risk. Planting units of *Halodule wrightii* will be harvested from the proposed seagrass donor area located in Perico Bayou, adjacent to the mitigation site (Figure 2). A 2012 seagrass survey of the proposed donor site documented predominantly continuous seagrass beds dominated by *H. wrightii* and *T. testudinum* (Stantec, 2013b). Seagrass donor material will only be harvested from areas with a minimum Braun-Blanquet (BB) cover-abundance of “4”. The minimum spacing between donor seagrass planting units harvested from the seagrass donor will be 5 feet. Planting units will be harvested in a systematic way, along transects, such that the locations of harvested planting units can be tracked and monitored following harvesting. All harvested seagrass planting units will be kept adequately saturated and protected from desiccation during the transplanting activities. All harvested units will be planted the same day that they are harvested (Stantec, 2013a).

All seagrass planting activities will be conducted during the summer growing season under the supervision of Manatee County or their designated, qualified consultants/contractors. The “modified shovel method” and “pneumatic plugger method” are the proposed planting methods to be utilized to transplant seagrass planting units within the seagrass creation area. However, the Permittees request the flexibility to use other methods (e.g. peat pot, bare root, PVC corer) that have shown demonstrated success for seagrass transplanting and are not likely to cause adverse damage to seagrass donor areas (Stantec, 2013a).

A pre-construction survey will be conducted during the summer growing season to obtain an updated characterization of the seagrass community and to designate a suitable *H. wrightii* dominated donor area in Perico Bayou, as well as to document any natural seagrass recruitment within the designated mitigation site. Data collected will include species present, percent cover, and overall health. Prior to the pre-construction survey of the seagrass basin, the 2.8 acre planting area will be delineated on an aerial. Immediately following planting activities, the final 2.8 acre area will be surveyed and coordinates will be provided in the mitigation completion report. At the time of the pre-construction survey of the donor site, an additional survey will be conducted in the vicinity of the donor site in Perico Bayou to identify an appropriate reference site. The success criteria for the mitigation site will be based on the baseline characterization of the reference site, as the goal of the mitigation will be to establish a seagrass community that resembles the existing *H. wrightii* dominated seagrass habitat found in Perico Bayou. Success will be based on the mitigation site’s ability to achieve similar percent cover of seagrass to that found in the reference site.

Annual seagrass monitoring will be conducted in the Perico Preserve Seagrass Basin (mitigation site) to document success of the seagrass planting, in the Perico Bayou reference site for comparison to the mitigation site, and in the Perico Bayou donor site to document the seagrass recovery. Surveys will be collected during the active growing season, June 1 – September 30 (Karazsia, 2010). Survey methodology will include resource delineation and qualitative and quantitative assessment methods, described in Section 3.2. Raw data and monitoring reports will be submitted to agencies in compliance with permit requirements (see Section 3.3 for proposed reporting protocol).

A summary of the proposed mitigation includes the following steps:

1. Manatee County excavated the basin from fallow farm fields and established the tidal connection to Perico Bayou in September 2015.
2. The Permittees will expedite establishment of seagrass in the basin by transplanting *Halodule wrightii* from the Perico Bayou donor site to a 2.8 acre site within the Perico Preserve Seagrass Basin.
3. Annual seagrass monitoring will be conducted in the Perico Preserve Seagrass Basin mitigation site to document the success of the mitigation and to ensure the success criteria are met. It is anticipated that the mitigation site will resemble the donor site within five years of planting.
4. Annual monitoring will be conducted in the Perico Bayou reference site for comparison to the mitigation site.
5. Annual seagrass monitoring will be conducted in the donor site in Perico Bayou to document the site's recovery.
6. Monitoring data and reports will be submitted to agencies in compliance with permit requirements.

3.0 MONITORING FOR SECONDARY IMPACTS

In addition to mitigation for direct impacts described in Section 2.0, monitoring must be conducted outside of the borrow areas in order to determine any secondary (indirect) impacts to seagrass that may result from construction of the Lido HSDR project.

3.1 SURVEY SCHEDULE

All submerged aquatic vegetation (SAV) resources within the potential influence of the project will be monitored before and after each dredging event in the vicinity of Big Sarasota Pass. All monitoring surveys shall be conducted within the summer SAV growing season during the period of peak seagrass biomass and distribution (June 1 – September 30; Karazsia, 2010). If dredging occurs during the growing season, then SAV surveys shall be conducted immediately prior to dredging and immediately after dredging has been completed, within the same growing season. However, if dredging occurs outside of the growing season (e.g., winter months), then monitoring shall be done during the summer growing season immediately prior to construction and the summer growing season immediately following construction; in this scenario, the post-construction survey shall be done as close as possible to the same time of year as the pre-construction survey to avoid seasonal differences.

3.2 SURVEY METHODOLOGY

During each pre- and post-construction survey, the following monitoring tasks shall be completed in areas of seagrass cover located outside of the borrow areas to a distance of 150 m beyond the dredge template (Figure 1). Figure 1 shows the 150 m area around the maximum extent of the three

proposed borrow areas; however, the seagrass surveys associated with each project will be collected within 150 m of the actual portions of the borrow areas that will be dredged for each construction event.

3.2.1 *In-situ* Seagrass Delineation

During each survey, biologists will investigate areas where seagrass has been previously documented outside of the borrow areas (Figure 1). Biologists will also conduct a general reconnaissance towed video survey within the 150 m mixing zone around the borrow areas, and if additional areas of seagrass are observed, the survey will be expanded to include these locations. Divers (or snorkelers if depth is shallow) will visually locate the edge of the seagrass beds and follow the edge of the community while towing a buoy equipped with a Differential Global Positioning System (DGPS) antenna linked to a topside laptop computer running HYPACK navigational software. The positioning data will be recorded, and the total acreage of seagrass within each patch during each survey shall be reported. These seagrass areas will also be characterized based on qualitative and quantitative data (described in Sections 3.2.2 and 3.2.3, respectively) collected within each patch. The post-construction SAV acreage will be compared to the pre-construction SAV acreage.

3.2.2 Qualitative Assessment

Biologists will visually assess species composition, above-ground biomass, epiphyte coverage, and overall condition of each seagrass patch within the survey area (Figure 1). A detailed description of the current condition of seagrass resources will be provided, including a description of any visually conspicuous changes in the condition of resources compared to previous surveys.

3.2.3 Quantitative Survey

Based on the 2014 survey (CB&I, 2014), the seagrass located within 150 m of the Lido Key HSDR Project borrow areas consists of some patchy areas of seagrass as small as less than 0.5 m² (0.0001 acre) as well as areas of large continuous seagrass beds within Sarasota Bay (Figure 1).

Data Collection within Patches. Biologists will document the Braun-Blanquet (BB) cover-abundance scores (Table 1) for SAV within haphazardly placed 0.25 m² (0.5 m x 0.5 m) quadrats established during the initial pre-construction survey within each seagrass patch. Quadrat placement will not be biased (e.g., towards the center of the patches or densest areas), but will be distributed throughout the patch to characterize the cover. The number of quadrats per seagrass patch will be determined during the pre-construction baseline survey and will depend upon the size of each bed. Generally, FDEP recommends that at least 10% of the area be sampled, with a minimum of three (3) quadrats sampled per patch. For larger patches, FDEP will be consulted regarding the possible use of larger quadrats (0.5 m² or 1.0 m²). The corresponding pre- and post-construction surveys will sample the same number and sizes of quadrats for each patch, even if patch size has declined. A BB score will be reported for each of the SAV taxa present within quadrats. Additionally, the BB score for total cover of all SAV taxa present within quadrats shall be reported. Note, the total BB score is not the sum of individual taxa BB cover scores; it is a separate measurement.

Data Collection along Permanent Transects. Biologists will establish and monitor permanent, 50 m long transects within large continuous seagrass beds located within 150 m of Borrow Area C (Figure 1). The number of transects established will be determined based on the size of the

seagrass beds delineated during the pre-construction survey based on FDEP guidance. Eleven (11) 0.25 m² (0.5 m x 0.5 m) quadrats will be sampled at regular intervals every 5 m along each transect (at the 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 m locations). The permanent transects and quadrats will be sampled in the same locations during the post-construction survey. A BB score shall be reported for each of the SAV taxa present within quadrats. Additionally, the BB score for total cover of all SAV taxa present within quadrats shall be reported.

Table 1. Braun-Blanquet Abundance Scores.

Score	Cover
0	Taxa absent from quadrat
0.1	Taxa represented by a solitary shoot, <5% cover
0.5	Taxa represented by a few (<5) shoots, <5% cover
1	Taxa represented by many (>5) shoots, <5% cover
2	Taxa represented by many (>5) shoots, 5 - 25% cover
3	Taxa represented by many (>5) shoots, 25 - 50% cover
4	Taxa represented by many (>5) shoots, 50 - 75% cover
5	Taxa represented by many (>5) shoots, 75 - 100% cover

The FDEP JCP compliance officer will be notified when each survey will begin and when each survey is complete.

3.3 REPORTING

Raw data, including copies of data sheets and shapefiles of the seagrass patches, will be submitted to FDEP within 45 days of the completion of each survey. A post-construction seagrass monitoring report will be prepared and submitted to the FDEP for review within 90 days of the completion of each monitoring event. The report shall include analyses to evaluate whether the cover of SAV changed significantly over time (i.e., statistical comparison of pre- and post-construction BB score data). Summary statistics (means and standard deviation values) shall be presented, and the report shall provide a comparison of pre- and post-construction BB cover values for each patch and for the entire survey area. The results section of the monitoring report shall include: the frequency of occurrence (proportion of all quadrats that contained seagrass), the density (mean BB score for all quadrats sampled), and the abundance (mean BB score for only those quadrats containing seagrass). Additionally, if available at the time of the post-construction seagrass survey, the as-built survey data will be evaluated to determine if any dredging occurred beyond the authorized footprint or if sloughing of materials occurred. If analysis indicates that unpermitted impacts to seagrass habitat have resulted from the project, FDEP shall be notified.

4.0 REFERENCES

CB&I. 2014. Lido Key Hurricane and Storm Damage Reduction Project, Benthic Resource Investigation Observation Report. Submitted to U.S. Army Corps of Engineers. Jacksonville District, Jacksonville, Florida.

CB&I. 2016. Perico Preserve Seagrass Basin Site Visit, May 21, 2016, Field Observation Report. Prepared by CB&I with input from Mark Sramek (NMFS HCD) and Damon Moore (Manatee County). Submitted to FDEP, USACE, FWC, NMFS, USFWS, Manatee County and City of Sarasota on May 31, 2016.

Coastal Planning & Engineering, Inc. (CPE). 2012. Perico Preserve Habitat Restoration Modeling Study, Manatee County, Florida. Prepared for Manatee County, Florida. December 2012.

Davis, L. 2016. Personal communication with Luke Davis, Fisheries and Wildlife Biological Scientist III, Florida Fish and Wildlife Conservation Commission (FWC), regarding his Perico Preserve site visit. Email dated May 31, 2016.

Edwards, L. 2016. Personal communication with Lainie Edwards, Ph.D., FDEP Program Administrator, Beaches, Inlets and Ports Program. Confirmation that Perico Preserve Seagrass Basin is located in the same Sarasota Bay watershed as Big Sarasota Pass. Email dated March 16, 2016.

Karazsia, J. 2010. A Science-based Seagrass Survey Window for Coastal Construction Planning in Florida. Prepared by Jocelyn Karazsia, NOAA NMFS Southeast Region, Habitat Conservation Division. May 1, 2010.

Moore, D. 2016. Personal communication with Damon Moore, Environmental Program Manager, Manatee County Parks and Natural Resources Department, regarding Perico Preserve Seagrass Basin. Communication via phone calls, emails and site visit.

Southwest Florida Water Management District (SWFWMD). 2012. Seagrass Distribution from Tarpon Springs to Boca Grande. Shapefile provided online for SWFWMD Surface Water Improvement and Management (SWIM) projects:

http://www.swfwmd.state.fl.us/data/gis/layer_library/category/swim. Last accessed November 30, 2015.

Stantec. 2013a. Rookery at Perico Seagrass Advance Mitigation, Mitigation Establishment Criteria Report. May 17, 2013.

Stantec. 2013b. Rookery at Perico Seagrass Advance Mitigation, October 2012 Seagrass Survey Report.

APPENDIX A
UMAM EVALUATION

Lido Key Hurricane and Storm Damage Reduction Project

[illegible]

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name: Lido Key Hurricane and Storm Damage Reduction Project		Application Number: FDEP File Number 0333315-001-JC		Assessment Area Name or Number: Impact - SAV Within Borrow Areas	
FLUCFCs Code: Seagrass - 9111 (Sparse)		Further classification (optional): sparse cover (less than 5%) of <i>Halodule wrightii</i> (shoal grass)		Impact or Mitigation Site? IMPACT	
				Assessment Area (acres): 1.68	
Basin/Watershed Name/Number: Gulf of Mexico		Affected Waterbody (Class): Class III		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance): A portion of Borrow Area C falls within OFW/Class II waters within Big Sarasota Pass/Sarasota Bay; however, no seagrass is located within this portion of Borrow Area C. All seagrass within the borrow areas (area of direct impact) is located outside the OFW in the open Gulf of Mexico.	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands: Borrow Areas B, C and D are located within the nearshore Gulf of Mexico and Big Sarasota Pass. Big Sarasota Pass connects the Gulf to Sarasota Bay.					
Assessment area description: This assessment area includes Borrow Areas B, C and D. Based on a recent benthic resource survey (CB&I, 2014), direct impacts to 1.68 acres of patchy seagrass (<i>Halodule wrightii</i> (shoal grass)) will result from direct removal during dredging. Data show that percent cover of this seagrass within the borrow areas was sparse, at less than 5%.					
Significant nearby features: The project area includes Big Sarasota Pass and coastal waters of the Gulf of Mexico adjacent to Lido and Siesta Keys.				Uniqueness (considering the relative rarity in relation to the regional landscape): Not unique.	
Functions: Seagrass offers habitat for numerous vertebrate and invertebrate species important to estuarine and marine productivity.				Mitigation for previous permit/other historic use: none	
Anticipated Wildlife Utilization Based on Literature Review (list of species that are representative of the assessment area and reasonably expected to be found): Seagrass in Florida commonly provides habitat to juvenile and adult fish, clams, worms, crabs, echinoderms, bryozoans, sponges and forams. Manatees and sea turtles graze on seagrass and dolphins may feed on organisms that live in seagrass beds. Seagrass also protects coastal habitats by binding soils and reducing erosion and turbidity during strong tidal currents or storms.				Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area): Nearshore waters in the project area may be utilized by the Florida manatee (<i>Trichechus manatus latirostris</i>) and sea turtles: loggerhead (<i>Caretta caretta</i>), green (<i>Chelonia mydas</i>), leatherback (<i>Dermochelys coriacea</i>), Kemp's ridley (<i>Lepidochelys kempii</i>) and hawksbill (<i>Eretmochelys imbricata</i>).	
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): During the September 2014 benthic resource investigation (CB&I, 2014), the only observed wildlife within the seagrass beds was the presence of many keyhole sand dollars (<i>Mellita tenuis</i>).					
Additional relevant factors:					
Assessment conducted by: Lauren Floyd (CB&I) and Aubree Hershoin (USACE) (based on Sept. 2014 benthic resource survey (CB&I, 2014)).				Assessment date(s): 7/6/2016	

PART II – Quantification of Assessment Area
(See Sections 62-345.500 and .600, F.A.C.)

IMPACT

Site/Project Name: Lido Key Hurricane and Storm Damage Reduction Project	Application Number: FDEP File Number 0333315-001-JC	Assessment Area Name or Number: Impact - SAV Within Borrow Areas
Impact or Mitigation? IMPACT	Assessment conducted by: Lauren Floyd (CB&I) and Aubree Hershorin (USACE) (based on Sept. 2014 benthic resource survey (CB&I, 2014)).	Assessment date: 07/06/16

Scoring Guidance The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current with <div>8 0</div>	The borrow areas contain small isolated patches of sparse (< 5%) <i>Halodule wrightii</i> (CB&I, 2014). Dredging of the borrow areas would completely remove the seagrass within the dredge footprint.
.500(6)(b) Water Environment (n/a for uplands) w/o pres or current with <div>8 8</div>	The assessment area is in the nearshore habitat of the Gulf of Mexico with open circulation. It is often exposed to high wave energy with generally clear water. The water environment will not be permanently altered by this project.
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current with <div>8 0</div>	Vegetation community consists of 1.68 acres of sparse (less than 5% cover) <i>Halodule wrightii</i> . Dredging of the borrow areas would result in the complete removal of seagrass located within the dredge template.

Score = sum of above scores/30 (if uplands/20)	
current	with
or w/o pres	
0.8	0.266667

If preservation as mitigation,	
Preservation adjustment factor =	
Adjusted mitigation delta =	

For impact assessment areas	
FL = delta x acres =	0.8960

Delta = [with-current]
0.53333333

If mitigation	
Lido Key Hurricane and Storm Damage Reduction Project	
Risk factor =	

For mitigation assessment areas	
RFG = delta/(t-factor x risk) =	

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name: Lido Key Hurricane and Storm Damage Reduction Project		Application Number: FDEP File Number 0333315-001-JC		Assessment Area Name or Number: Perico Preserve Seagrass Basin, with Planting	
FLUCFCs Code: 911 - Seagrass		Further classification (optional):		Impact or Mitigation Site? MITIGATION	Assessment Area (acres): 2.8
Basin/Watershed Name/Number: Sarasota/Lemon Bay Drainage		Affected Waterbody (Class):		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance):	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands: The Perico Preserve Seagrass Basin is surrounded by restored upland and wetland habitats on the north, south, and west. On the east, the area abuts existing mangrove forest and has two excavated tidal connections to Perico Bayou which were established in September 2015. The tidal connections were designed to mimic the tidal regime within Perico Bayou, and the design was supported by a numerical modeling study (CPE, 2012).					
Assessment area description: The assessment area includes fallow farm fields excavated to -2 feet NAVD and tidally connected to Perico Bayou through two flushing channels. The area will be vegetated with seagrass (<i>H. wrightii</i>) seagrass units transplanted from the adjacent Perico Bayou donor site. The ERP No. 43040091.003 (issued November 4, 2013) for the Rookery at Perico Seagrass Advance Mitigation (SWFWMD, 2013) established a UMAM baseline mitigation condition for Location/Landscape, Water Environment and Community Structure as "zero" for the created seagrass basin, pursuant to 62-345, F.A.C.. Therefore, this UMAM assessment uses a baseline mitigation condition of zero for all three categories.					
Significant nearby features: Perico Bayou, Palma Sola Bay, Manatee River, Perico Preserve			Uniqueness (considering the relative rarity in relation to the regional landscape): The seagrass habitat will not be unique; however, the conversion of fallow farmland to seagrass habitat is unique.		
Functions: Water quality improvement, wildlife shelter and nursery habitat, wildlife food source, detrital input.			Mitigation for previous permit/other historic use: None.		
Anticipated Wildlife Utilization Based on Literature Review (list of species that are representative of the assessment area and reasonably expected to be found): Finfish, including snook, redfish, snapper, spotted sea trout, flounder, mullet, and many other fish species common to local waters. Crabs, stingrays, oysters, pink shrimp, and various crustaceans and mollusks common to local waters. West Indian manatee. Wading and diving birds, including wood storks, ducks, cormorants, great egrets, and pelicans.			Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area): Florida manatee (<i>Trichechus manatus latirostris</i>) and listed wading birds.		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): N/A					
Additional relevant factors: Seagrass creation includes excavating fallow farm fields to -2 feet NAVD and tidally connecting the site to Perico Bayou through two flushing channels to create suitable seagrass habitat - this phase was completed in September 2015. Next, the area will be planted with seagrass planting units (<i>Halodule wrightii</i>) harvested from an adjacent <i>H. wrightii</i> dominated donor site in Perico Bayou. Seagrass monitoring will be conducted in the restoration area to document success of the seagrass planting and in the donor site to document the recovery. A reference site in Perico Bayou will also be monitored for comparison to the mitigation site. An interagency site visit (USACE, USFWS, NMFS, Manatee County, CB&I) was conducted on 5/12/16, and FWC staff conducted a visit on 5/24/16. Agency representatives agree that this site is a viable mitigation option for the Lido Key HSDR Project (CBI, 2016). The ERP No. 43040091.003 for the Rookery at Perico Seagrass Advance Mitigation (SWFWMD, 2013) established a UMAM baseline mitigation condition for Location/Landscape, Water Environment and Community Structure as "zero" for the created seagrass basin, pursuant to 62-345, F.A.C.. Therefore, this UMAM assessment uses a baseline mitigation condition of zero for all three categories.					
Assessment conducted by: Lauren Floyd (CB&I) and Aubree Hershorin (USACE). Perico site information provided by Manatee County and Stantec, 2013. Site visit conducted 5/12/16.			Assessment date(s): 7/6/2016		

**PART II – Quantification of Assessment Area
(See Sections 62-345.500 and .600, F.A.C.)**

MITIGATION

Site/Project Name: Lido Key Hurricane and Storm Damage Reduction Project	Application Number: FDEP File Number 0333315-001-JC	Assessment Area Name or Number: Perico Preserve Seagrass Basin, with Planting
Impact or Mitigation? Mitigation	Assessment conducted by: Lauren Floyd (CB&I) and Aubree Hershorin (USACE). Perico site information aprovided by Manatee County and Stantec, 2013. Site visit conducted 5/12/16.	Assessment date: 07/06/16

Scoring Guidance The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Optimal (10) Condition is optimal and fully supports wetland/surface water functions	Moderate(7) Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal (4) Minimal level of support of wetland/surface water functions	Not Present (0) Condition is insufficient to provide wetland/surface water functions
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.500(6)(a) Location and Landscape Support w/o pres or current 0	with 8	The "current" condition is considered the fallow farmland (pre-excavation of the basin), with a score of zero. The seagrass creation area ("with mitigation") will be surrounded by complimentary habitats created along the slope of the seagrass basin. These areas will consist of a mangrove forest, naturally-recruited salt marsh, and coastal forest. The mangrove forest will increase function of the seagrass creation area as a nursery habitat. All of the habitats will function to reduce erosion from adjacent areas. The seagrass creation area as well as the adjacent habitats will be maintained to minimize or eliminate the presence of invasive plants. The flushing channels will provide regular tidal exchange and will eliminate barriers for fish and other aquatic animals to access Perico Bayou. The area beyond the seagrass creation area and adjacent slope habitats includes Phase 1 upland and wetland restoration areas on the south, west, and north. This assemblage of varied habitats provides a wildlife corridor and significant cover for wildlife accessing the seagrass creation area and adjacent habitats. The Rookery Island has been located within the central portion of the seagrass creation area to minimize the ability for predators to reach the island. The Rookery Island has been designed to provide a mangrove fringe for nesting and an interior salt barren for ground roosting and foraging.
.500(6)(b)Water Environment (n/a for uplands) Upland (U) or Wetland (W) w/o pres or current 0	W with 8	The "current" condition is considered the fallow farmland (pre-excavation of the basin), which had no water environment. This upland environment has a score of zero. The seagrass creation area ("with mitigation") has been excavated to -2.0 feet NAVD, which corresponds to elevations within Perico Bayou that currently support healthy continuous seagrass cover. The area surrounding the Rookery Island has been excavated to -2.7 feet NAVD to provide increased protection from predators accessing the island from land during low tides. On the east, the area abuts existing mangrove forest and has two excavated tidal connections to Perico Bayou which were established in September 2015. The tidal connections were designed to mimic the tidal regime within Perico Bayou, and the design was supported by a numerical modeling study (CPE, 2012). The modeling results demonstrate the tidal regime will mimic Perico Bayou and provide optimal flushing times for seagrass establishment and growth. The results also demonstrate that normal flow velocities will not cause adverse erosion, sedimentation, or scouring within or adjacent to the seagrass creation area. It is anticipated that the increased basin area and presence of SAV will provide a net water quality benefit to those portions of Perico Bayou that regularly receive tidal exchange with the seagrass creation area. The placement of oyster shell along the flushing channels will provide substrate for the attachment and colonization by mollusks and crustaceans. The presence of these water filtering organisms will provide water quality benefits, in addition to the increase forage value for fish, crabs, and other predators.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current 0	with 9	The "current" condition is considered the fallow farmland (pre-excavation of the basin); this upland environment has a score of zero. The seagrass creation area ("with mitigation") has been constructed to have a very consistent bottom elevation throughout, with a deeper (0.7 foot) area surrounding the Rookery Island. This will allow the area to function similar to large grass flats existing in Perico Bayou and other parts of Sarasota Bay and Tampa Bay. Natural forces, such as bioturbation, will likely alter elevations in isolated areas providing a more natural bottom that will be beneficial to seagrass development. It is anticipated, based on the proposed design, that the creation area will provide optimal seagrass habitat for the seagrass species themselves as well as fauna likely to utilize the habitat. The assemblage of invertebrate and fish species utilizing the seagrass creation area is likely to be similar to the connected and adjacent habitats of Perico Bayou, Sarasota Bay, and southern Tampa Bay.

Score = sum of above scores/30 (if uplands/20)	
current or w/o pres	with
0.0000	0.8333

If preservation as mitigation,	
*Preservation adjustment factor = (0 to 1, 1/10th increments)	1
Adjusted mitigation delta =	0.83333333
*use 1.0 for creation	

For impact assessment areas	
FL = delta x acres =	

Delta = [with-current]
0.83333333

If mitigation (creation or enhancement)			
Time Lag	Years	t-factor =	1.14
	5		
*Risk factor = (1 to 3, 0.25 increments)			2.25
*use 1.0 for preservation			

For mitigation assessment areas	
RFG = delta/(t-factor x risk) =	0.3249